Figure 3 Original HTML page displayed in a browser

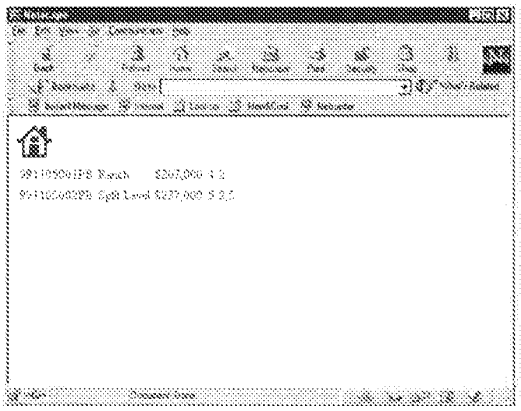
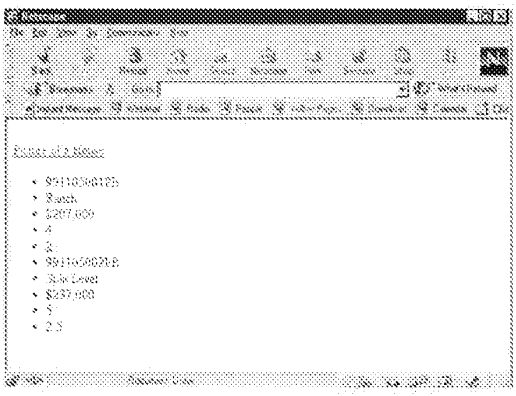


Figure 4 Transcoded HTML page showing the simplified layout



a given type of structure of an XML document and the stylesheets used to manipulate such documents might be considered important proprietary resources and need to be kept secure. Also, as the number and types of devices allowing Internet access increase, an approach based on different stylesheets for each device type could cause the number of stylesheets an organization needs to create and maintain to increase precipitously. As WTP and stylesheet tools evolve, there will be increasing support for stylesheet parameterization and stylesheet internalization, and increasingly complex criteria for selecting the right set of stylesheets for a given purpose. Stylesheets are standard, general, and extensible, but using stylesheet transcoding requires that an XSL stylesheet be written to perform the desired transcoding.

Transformation of HTML into WML. The Wireless Markup Language (WML) is an XML-based markup language intended for use in specifying content and user interface information for narrowband devices, including pagers and cellular phones. It is part of the Wireless Application Protocol (WAP) standard from the WAP Forum.[16] WAP-enabled phones are becoming more and more prevalent, especially in Europe, with the Nokia Group and others manufacturing phones that support the WAP wireless standard. Many enterprises that now provide information access to users using desktop browsers wish to support their mobile users who would like to access their information by using WAP devices, but the enterprises do not wish to expend the resources to provide content in both HTML for workstation browsers and WAP devices. WTP provides transcoding support for transforming HTML into WML.

WTP transforms HTML into WML in a two-step process, with an optional third step to further refine the result. The first step takes the original HTML document and converts it into a Document Object Model (DOM) representation using an HTML parser developed by a team at the IBM Tokyo Research Laboratory. The DOM is essentially a tree structure, conforming to a World Wide Web Consortium requirements standard.[17] Using standard Java application programming interfaces (APIs) for traversing and manipulating the DOM, the second step modifies the HTML DOM, creating a DOM containing WML elements, conforming to the WML standard. This transformation is done on an element-by-element basis. For example, an HTML document starts with an *HTML element* (node), whereas a WML document starts with a *WML element*. Thus, the transformation logic responsible for processing the HTML node replaces this node with a WML node in the DOM.

The logic for dealing with a particular HTML element falls into one of three categories:

1. The transformation requires unique logic, such as the HTML example described above.
2. The source element, and all the children under it, are simply deleted. An example is the APPLET element, which represents a Java applet. Since it is not possible to transform the Java applet into some

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other form for execution on the WAP device, the APPLET element and its contents are simply deleted.
3. The source element is replaced by its children. That is, everything under the top element replaces the top element itself. For example, the SUP element, which indicates text contained within it should be rendered in a superscript font, is replaced by the text it contains, since superscript fonts are not supported in WML. In text form, this would be seen as replacing "^{special text}" with simply "special text."

The first case above requires special logic for each transformed element, whereas the second and third cases can each be handled by a single processing module, with the HTML elements to be handled simply by providing them to the module in the form of some list. Thus, the module responsible for deleting elements and their children is given a list of element names that should be transformed in this way.

Once a document has been converted to the target markup language, it can be further tailored by a step called *text clipping*. There are a couple of reasons why this might be beneficial:

1. The application of generic transformation logic to a specific document, although resulting in a valid WML document, may still not result in the most visually pleasing results.
2. The transcoded document may contain a large amount of unnecessary content that tends to obfuscate the key information the user was requesting. For example, although it may be reasonable to provide links to every product and department in a company in a table at the top of a page rendered on a powerful desktop browser, these links may just frustrate the user as he or she has to scroll past them to find the information actually requested.

There are three ways in which the text clipping process might be accomplished:

1. Because WML is an XML-based language, XML stylesheets can be used.
2. The transcoding logic can work with the text form of the document, using traditional string manipulation functions to locate the points at which to remove text.
3. The transcoding logic can operate on the DOM directly.

All of these approaches require that specialized logic be written, in either Java or XSL, to perform the desired clipping.

The first approach, applying stylesheets to XML, was explained in the previous subsection and is not explained further here. Experience has shown that the second approach can have serious limitations unless the content never changes. Assume that the content is a weather forecast and that the main forecast description is preceded by the string "Local Forecast." Suppose, "Local Forecast" was enclosed in a B (bold typeface) element:

<B>Local Forecast</B>

Note that if we search simply for the string "Local Forecast" and remove the text prior to this point, the result is

Local Forecast</B>

which is invalid, because there is an ending tag (</B>) without the beginning tag (<B>). The solution to this problem is to search for the *exact* text, including tags. However, even a small change to the content, such as the B tags being replaced with I (italic) tags, would make the transformation fail.

The third text clipping approach, working directly with the DOM, has distinct advantages. Individual nodes in the DOM tree represent the beginning and ending tags of the element, so that when a node is removed, there is no problem with removing the beginning tag without the ending tag. Also, it is possible to search a portion of the DOM for text regardless of the element nodes of which they are children. For example, it would be possible to search for the text node "Local Forecast" regardless of the fact that the text was a child of a B or an I node. To aid in the creation of text clippers that operate on the DOM, WTP provides functions such as findNodeMatchingPattern, which searches under a particular node in the DOM for a text node whose text matches a given regular expression pattern, and findSiblingMatchingPattern, which searches under siblings of a given node and their children for a text node matching a given pattern. With use of such functions to allow searching and modification of the DOM based on string patterns, it is possible to write text clipping transformations that can withstand minor changes to the source content without requiring updates to the text clipping logic.

Figures 5 and 6 show tree representations of a DOM before and after clipping. The DOM in Figure 6 is created from the DOM in Figure 5 by a Java clipper performing the following steps:

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Figure 5 DOM created by an HTML to WML transcoding step

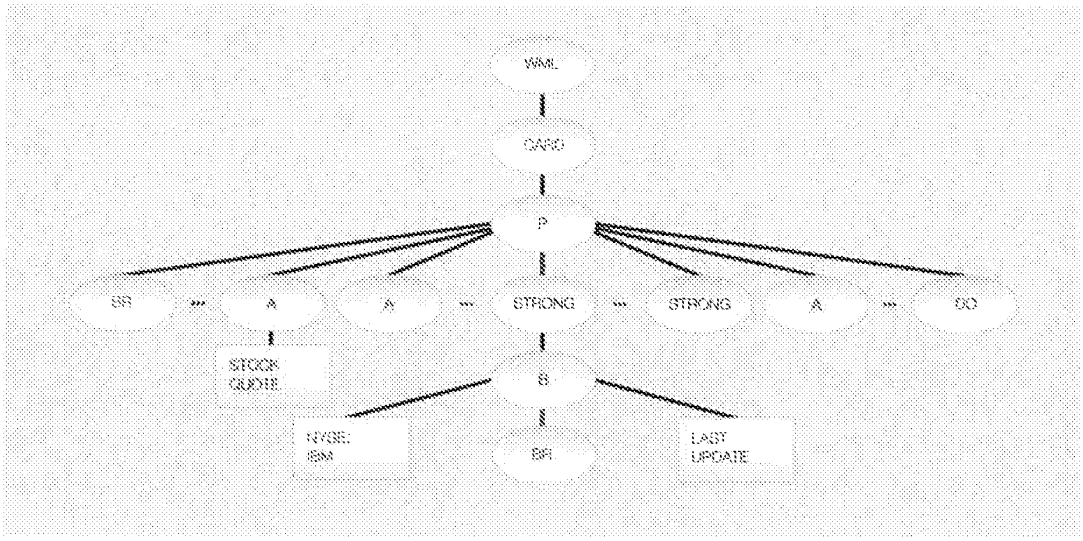
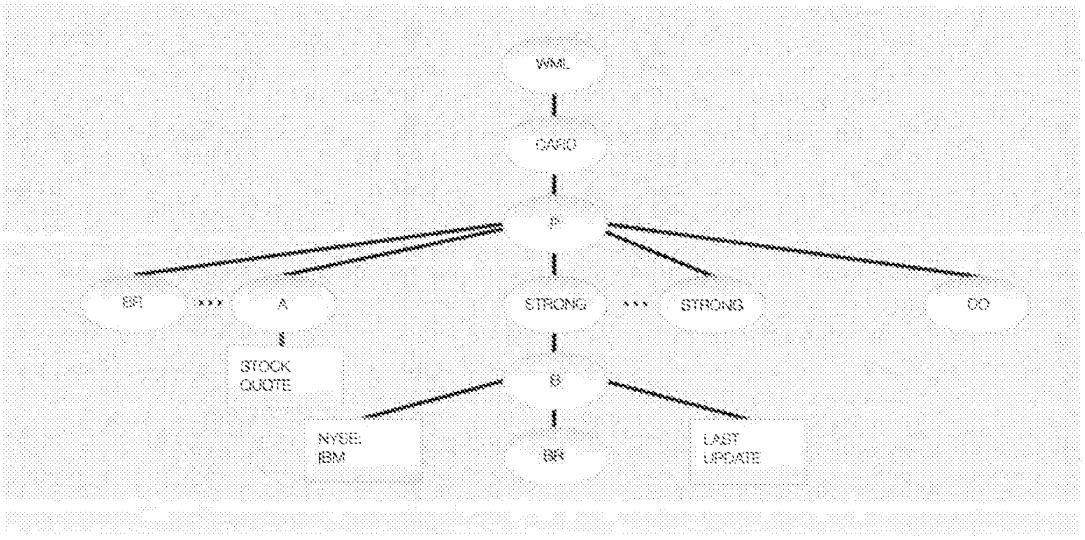


Figure 6 "Clipped" DOM, created from the previous DOM by a Java clipper



1. Find the paragraph (P) node in the document. There should only be one of these generated by the previous HTML to WML transcoding step.
2. Search for a child node of the P node that has a text node somewhere beneath it containing the string "Stock Quote."

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3. Remove all siblings before the node found in step 2.
4. Look at all siblings following the node found in step 2 until we reach the first anchor (A) node.
5. Starting with the anchor node found in step 4, delete all nodes until we find the node that contains a text node beneath it containing "Last Update."
6. Starting with the node found in step 5, keep all sibling nodes until the next anchor node is reached. (Note that the last node before the first anchor node found is a STRONG node.)
7. Starting with the anchor node found in step 6, delete all following sibling nodes until a DO node is found.

The HTML to WML transcoding approach described above can be used for transforming HTML to other markup languages, such as HDML, compact HTML, or imode.

WML deck fragmentation. WML content, as defined by the WAP Forum, is organized for rendering in a *card*, similar to a page in HTML. A collection of cards is known as a *deck*. A single WML file contains a deck and its component cards, allowing several cards to be delivered to the phone in one request, even though only one card is displayed at a time. Many devices such as WML phones have a limited memory capacity. Thus they present a special challenge for transcoding, since the transcoded content delivered to the device must not exceed the capacity of the device. In general, HTML pages that are converted to WML as described above will not fit in the limited storage available on these devices. Even content that is generated as WML originally may exceed the device limit. All such content must be subdivided so that each subdivided piece will fit in the device. In WTP, the process of breaking up such pages into acceptably sized pieces is called *WML deck fragmentation*. This procedure is performed by the *WML fragmentor*. Although the initial implementation works with WML, the same techniques are easily applied to other markup languages such as imode.

If the WML fragmentor needs to fragment a WML deck generated by the HTML-to-WML transcoding process, it can retrieve and operate on the DOM created for the document during that process. Otherwise the fragmentor parses the WML text itself in order to create a DOM. In either case, the fragmentor performs all of its operations on the deck as represented by a DOM, not on the plain WML text.

When presented with a WML deck that may need to be fragmented, the fragmentor must first determine both the maximum size deck that may be delivered to the device, and the size of the input deck as it will be presented to the device. The first piece of data is a configuration parameter associated with the user-agent field present in the HTTP request that produced the deck. The second is determined by "walking" the DOM that represents the deck and counting the size of each node as it will be seen by the device. When doing this counting operation, the fragmentor takes into account the binary encoding for WML tags that will be performed by the WAP gateway.

If the deck exceeds the maximum allowed size, then the fragmentation process begins. First, the individual cards are removed from the deck so that each may be considered independently. If a single card by itself exceeds the maximum card size, it must be fragmented into smaller subcards. A card is fragmented by walking the DOM that represents the card, keeping track of places in the tree where the card may be fragmented. The fragmentor will fragment on either <p> or
 tags. As the fragmentor visits each node in the tree, it determines the size of the card that would be produced if the main card was fragmented at this node. The fragmentor continues walking the DOM until this new card size exceeds the maximum. Once this limit is reached, the fragmentor ceases walking the DOM and fragments the card at the last noted fragmentation point. This process may be repeated for the card remaining after fragmentation, if its size still exceeds the maximum allowed. Each card that is oversized is fragmented in this fashion.

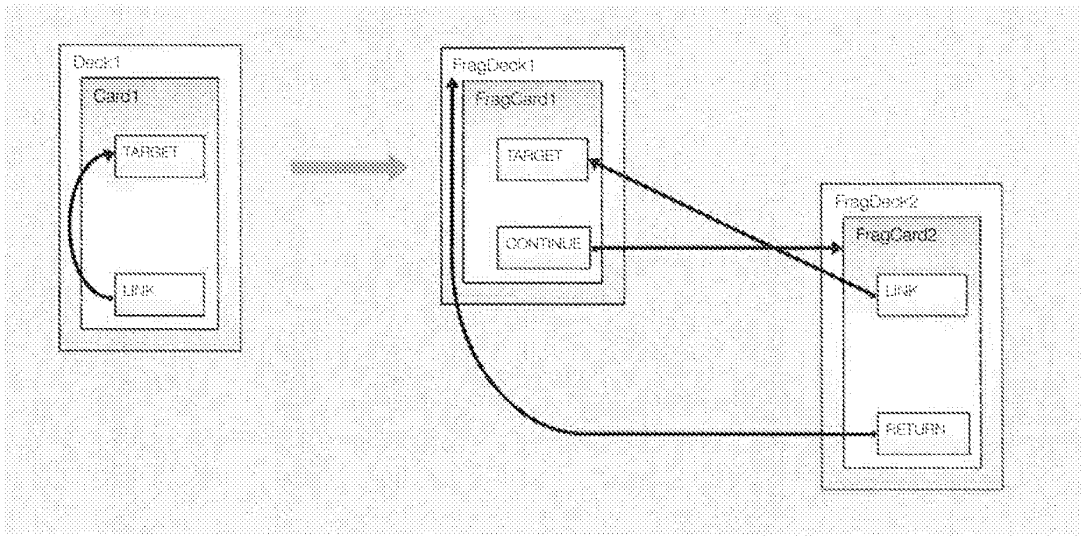
Note that as a card is fragmented, links are added so that the user may navigate from one card to another. Each fragment contains a <prev> element to allow navigation to the previous card, and a <go> element that will move the user to the next card in sequence. Figure 7 shows an example of linking fragments together in this way.

Once all of the individual cards are small enough, they are arranged into decks so that each deck is not larger than the maximum deck size. Unique deck names are generated by the fragmentor based on the original request URL. The final step in the fragmentation process is called *link rebinding*. During this step, the text of the HREF (the parameter specifying the URL of a linked resource) attributes of all links found in the decks is adjusted so that the target name

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Figure 7 Example of WML deck fragmentation; arrows represent links, either within or between fragments



is correct, based on the name of the deck in which each card was placed.

At this point the fragmentor sends the first generated deck to the device and stores the remaining generated fragments in the resource repository. The resource repository is simply a general-purpose storage facility maintained by WTP that allows for retrieval of one of the decks when a request is received for it. Such a request will be generated when a user follows any of the links in the first deck that point to a card in one of the other generated decks. Decks in the resource repository must eventually time out and be removed. Any one of a variety of cache algorithms may be used to determine when to remove decks from the repository. If a request is received for a deck that has been removed from the repository, then a deck is generated that contains an error message indicating that the fragment has expired and the original deck must be requested.

The WTP WML fragmentor described here works on any WML deck without any customization.

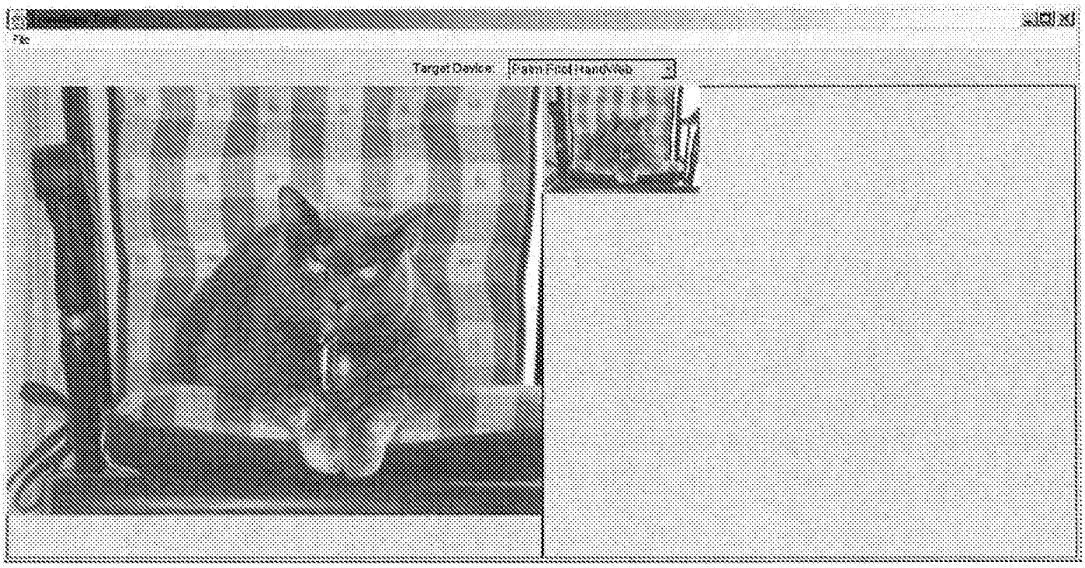
Image transcoding. The final type of dynamic transcoding we discuss is image transcoding. Images that view well and render (reasonably) quickly on a desktop browser connected to a local area network (LAN) may not appear in a usable form on the low-quality and small-sized screens of handheld devices. In addition, they may take unacceptably long to download and render on such devices. Finally, some devices do not support all image formats; therefore, to display an image at all it may be necessary to convert from the original image format to one supported by the device before transmitting the image to the device.

Image transcoding is performed in WTP by the *image engine*. Figure 8 is an example of an image processed by the image engine. The image on the right in the figure has been scaled and converted to gray scale to reduce the image size for display on a wireless device. Given an input image to transcode, the image engine must determine three things: the output format that should be used for the image, the scale factor to be applied to the image, and the output quality of the image. "Output quality" is a somewhat vague term. It is a measure of how "good" the image will appear on the screen. High-quality images will look sharp and clear, but will generally be considerably larger (in bytes) than lower-quality images. Also, note that low-quality screens may be incapable of displaying a high-quality image. In this case it is preferable to use a lower-quality image as output, since that will speed both transmission and rendering time.

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Figure 8 Example of image transcoding—a screen capture from the "Transform Tool" in WTP



Deciding the output format for an image is straightforward. If the input image is in a format accepted by the device, the format is not changed. Otherwise, the output format is set to be the first of the formats supported by the device (as determined by the user-agent, or UA, field in the HTTP request).

Scale factor may also be a simple configuration parameter associated with the requesting device. Generally, it will be set so that images appear relatively as big on the screen of the requesting device as they would on a desktop screen. Windows CE devices, however, do not have a fixed screen size. Rather, the screen size is indicated by the UA-pixels header included in the HTTP request. When this header is present, the image engine can use this information to dynamically calculate a scale factor based on the difference in size between the screen described by a UA-pixels header and some (configurable) standard screen size.

Finally, output quality is determined by combining information about the quality of the screen of the requesting device and the configured trade-off that should be made between quality and size for this request. The screen quality is a configured parameter for the device, and may be set to "high," "medium," or "low." The trade-off configuration parameter will generally be associated with a network type: Over a slow wireless link it would be better to favor small size over high-quality images, whereas over a LAN connection high quality would be preferred, since there is little to be gained in reducing the image size. Over a dial-up connection it would be appropriate to compromise between the two. The image engine first chooses a tentative output quality based on the screen capability, and then adjusts this size downward if the trade-off parameter is set to either compromise or favor small size.

The WTP image engine described here works without customization using defaults for preferences based on the client device type.

Source identification and preference aggregation

One of the major goals of WTP is to tailor the content sent to the user based on the user's environment—especially the device and connectivity limitations. The following two major steps are needed to accomplish this:

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1. Identify the characteristics, constraints, and preferences for each environment *source*. Such sources include device types, network types, and users. This step is a configuration step. In WTP the characteristics, constraints, and preferences are all given the single name *preferences* and are defined as key-value pairs consisting of a name and a value. For a given incoming request for some document or image from a user, identify the environment sources. For example, when a user requests www.ibm.com via a browser running on some client device, WTP tries to determine source information such as device type and network type[18] to determine what information is necessary to provide the most suitable transformation of the requested document. This step is called *source identification*.
2. Given multiple sources of preference information, provide the value of a given preference to use when requested by some transcoding logic. This issue is trivial when only one of the sources provides a value for a given preference. However, it is possible, for example, that both the device source and the network source provide a value for a given preference. In such a case, it is desirable to have some single mechanism responsible for taking multiple values for a given preference and providing a single value. With use of such an approach, numerous transcoding modules can be written using preference values, but without regard to how these values were determined. In WTP, the mechanism that provides this function is called the *preference aggregator*, because it "aggregates" multiple values into a single value.

Source identification. Identifying the device source type for an incoming HTTP request is based on the *user-agent* field in the HTTP header. For example, the user-agent field for an English language version of the Netscape Communicator 4.7 browser running on a Windows NT® system is "Mozilla/4.7 [en] (WinNT; U)." The user-agent field for the Netscape Communicator 4.6 version was identical, except that it specified "4.6" rather than "4.7." Rather than requiring source identification on exact matches on the entire user-agent string, WTP supports source identification based on a portion of the user-agent string. For example, specifying the pattern "*Mozilla/4.*" would mean that any browser with a user-agent string containing the string "Mozilla/4." would match the pattern. Additionally, WTP supports device source identification via pattern expressions combined via logical operators. Thus, the expression:

```
(user-agent=*Mozilla/4.*)|(user-agent=
                                *Mozilla/5.*)
```

means that any user-agent string containing "Mozilla/4." or "Mozilla/5." would match the pattern expression.

For network source identification, WTP currently does not have the benefit of an HTTP header field like the user-agent field used for device source identification. In the future, if WTP is used with some type of (perhaps wireless) gateway, it may be possible to receive some network connection identification information. Currently, WTP provides a much more basic mechanism. When operating as a transcoding proxy, WTP supports the use of separate Transmission Control Protocol ports to identify the type of network connection being used. That is, WTP can be configured to understand that port 8089 is a wireless network connection. Thus, if the browser of a client device is configured to connect to the WTP proxy via port 8089, a request from that device will then be assumed to be coming in via a wireless connection. Therefore, the *wireless* network profile will be used. The standard WTP configuration comes with *default*, *wireless*, and *14.4* profiles configured on different ports, but these can be changed or additional ones added.

Preference aggregation. For a given request, if more than one preference source has a value for a given preference requested by a transcoding module, the preference aggregator must provide a single value. In most cases, for a given preference name, the value specified in one source profile should take precedence over the value in another source profile. For example, the value of compressSource preference for the Windows CE device profile is *false*, meaning that no attempt should be made to reduce the size of HTML elements (by reducing noncritical attributes) sent to such devices. However, the wireless network profile specifies a value of *true* for the compressSource preference. For a request from a Windows CE device using a wireless connection, how should the value of compressSource be resolved? The preference aggregator allows a precedence ordering to be specified to help resolve such conflicts. The default precedence ordering that is configured is:

```
user, network, device, user-default,
   network-default, device-default
```

This ordering states that for a given preference name, if there is a specific (not default) user profile and it

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contains the preference value, it should be used. If not, if there is a specific (not default) network profile and it contains the value, it should be used, and so on. Thus, in our example, since WTP does not currently have a way of identifying specific users, there is a default user profile in addition to the wireless network profile and Windows CE device profile. Thus, given the above ordering, since there is a specific network profile (*wireless*) with a value of compressSource, its value (*true*) takes precedence. Because the same generic precedence ordering may not be appropriate for all preference values, WTP allows a different precedence ordering to be specified for preference names for which such an ordering is appropriate.

In some cases, rather than choosing a single value based on a precedence ordering, it might instead be desirable to combine the multiple values in some way. For example, it might be desirable to say that for a given preference whose value is Boolean, if either the network or device value is true, the value should be true. WTP also supports this capability on a preference-by-preference basis.

In order to provide such flexibility, the preference aggregator employs a *rules* mechanism. Generic rules, such as the one providing the default precedence ordering, are supplied, but preference-specific rules can be supplied as needed. As is typical with any rules engine, once a given preference has been resolved, the rules are not needed to resolve the value again. In WTP, a preference value remains for the life of a request because each request is distinct and can have different source information. The rules themselves, although actually Java classes, can be written in text form and then parsed and compiled. The rules language uses a compiled scripting language, NetRexx,[19] as an underlying scripting language so that powerful expressions can be supported without having to use a totally new scripting language. NetRexx, which is compiled into Java, can be used on any platform on which Java can be used.

At initialization time, and when preference profiles are updated because of configuration changes, rules based on the key-value pairs contained in the preference profiles are dynamically generated. Although the rules are compiled, there is still a run-time cost associated with interpreting the rules. In order to minimize the performance impact of using these rules, an analysis of the rules is done immediately after the dynamic generation of rules from preference profiles is done, and those rules that are derived based solely on source identification are cached so that their values can be "looked up" based on source identification information from the request without having to actually interpret the rules.

The rules-based mechanism provides almost unlimited flexibility in extending the preference aggregation mechanism, while allowing transcoding module writers to use preferences without worrying about how the values are resolved. In addition, the preference aggregation mechanism can be updated by an administrator without installing a new version of the product and without having to be a Java programmer.

Deployment models

Transcoding must be interposed at some point between the generation of the initial content and the final rendering on the client device. Three locations are available in the current Web architecture:

1. The client device
2. An intermediate point in the network, such as a proxy or firewall
3. The source of the content

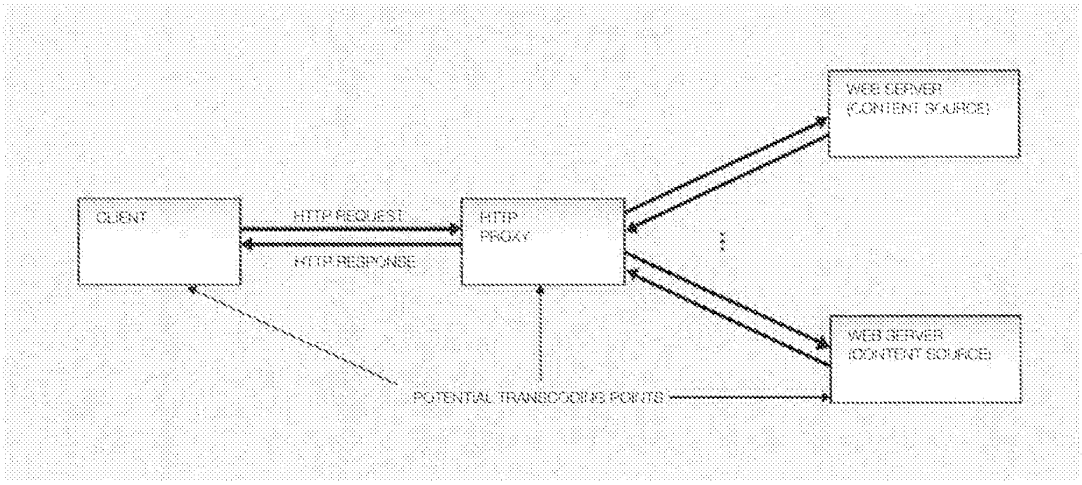
Figure 9 shows a simplified picture of a network configuration and the potential transcoding placement locations. Each has its strengths and weaknesses. Therefore, combinations of the approaches may be useful in some situations.

The Web experience is, today, still largely oriented toward a client model that assumes a high-bandwidth network connection and workstation capabilities. Content that is designed based on these assumptions is not usually appropriate for display on lower-capability devices or for delivery on low-bandwidth or high-cost connections. This is the crux of the problem when performing client transcoding. When we first started looking at client transcoding options for WebSphere Transcoding Publisher, we tried visiting a variety of sites on the Web. It could and did take 20 minutes or more to view some pages using a dial-up or wireless connection. Even over faster links, the very limited rendering speeds and capabilities of handheld devices will usually make pure client-side transcoding an unworkable solution. Image transcoding can be particularly problematic for clients because of its computationally intensive nature,

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Figure 9 Placement options for transcoding function in a network



large image sizes, and the potentially very high compression rates.[20]

Independent of the transcoding placement issue, there still needs to be a Web-capable presence on the client device. Additional client-side presence can be useful in providing transcoding-specific user options (such as image-specific transcoding options) or a controlled client environment.[21] Such a client can also provide additional information about client device capabilities, although emerging standards such as composite capability/preference profiles (CC/PP)[22] are expected to supplant this role.

WTP assumes only that there is Web rendering software of some sort on the client device and that the HTTP headers generated by the device either specify the capabilities of the device or allow it to be inferred. Currently available Web-capable devices meet this requirement through the use of user-agent and other descriptive headers. This allows WTP to effectively transcode for a wide variety of devices without additional client presence.

A second deployment option is at an intermediate point in the network, such as a firewall or proxy. In this model, all client requests are directed to the intermediate representative that forwards them on to the specified destination server. Most Web clients support use of proxies for at least HTTP. WTP can be configured to run as an HTTP proxy, and in this mode can transparently transcode content for these clients.

In the proxy model, all HTTP responses flowing to the client can be transcoded, regardless of the server producing the content. This approach, combined with the preference-based transcoding of WTP, allows new client devices to be easily added to a network. For example, a business that wishes to give employees with WAP phones access to internal Web content can do so by using a WAP gateway (for protocol conversion) and WTP proxy (for content transcoding), without requiring content to be specifically authored for the phones, and without impacting servers generating content.

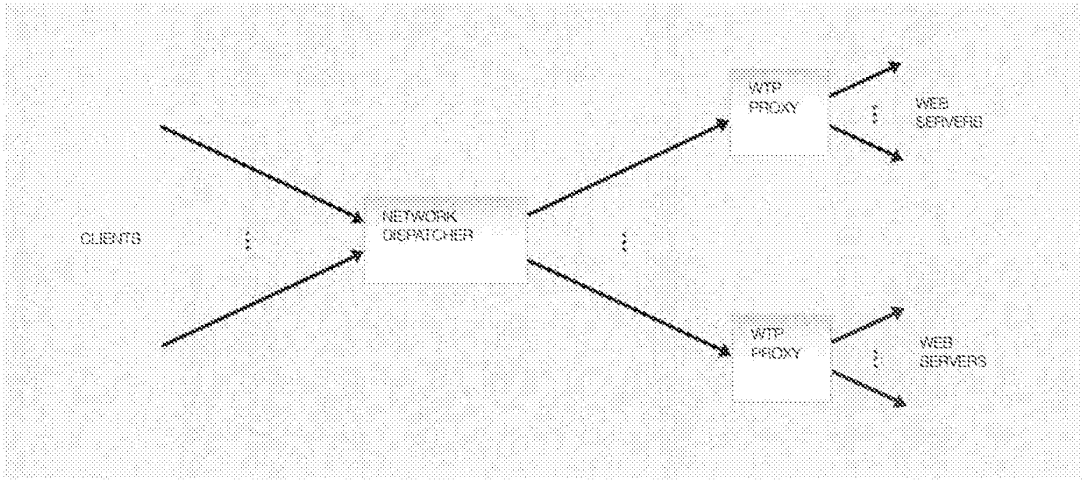
There are some drawbacks to the proxy approach for transcoding. The use of encryption such as secure sockets layer (SSL) to protect data precludes transcoding via a proxy. This drawback could be addressed by allowing the proxy to act as both an endpoint and a source for SSL connections. However, this additional point of exposure may not be acceptable to some users. It also imposes a significant performance penalty at the proxy.

Another potential concern of the proxy-based approach is legal, rather than technical. Some providers of content also wish to control the presentation

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Figure 10 Using Network Dispatcher



of this content, and so will not want it to be transcoded outside their control. Although this restriction will not be a concern in the corporate intranet example presented above, it can limit deployment in the external Internet environment.

A final area of concern with this approach is in extending the proxy with new transcoders. In the Web server environment, *de facto* standards such as the servlet API provide a widely supported method for extending function. There is no similar API yet in place for proxies. WTP is based on the Web Intermediaries (WBI) framework,[23] and supports extension via the WBI API. In addition, WTP allows transcoders written to the servlet API to be deployed in a WTP proxy.

Dynamic transcoding can be a relatively resource-intensive activity. Fortunately, techniques available for spreading requests across Web servers or proxies may also be used with a transcoding proxy. IBM's Network Dispatcher, for example, can serve as a front end for multiple transcoding proxies. This configuration is shown in Figure 10. WTP instances do not share transcoded data, and so session affinity mechanisms in Network Dispatcher are used to ensure that requests depending on a previous state (for example, deck fragmentation) are routed back to the correct instance of WTP.

A final option is to provide transcoding at the source of the data. This option, content source transcoding, is attractive for a number of reasons. It requires no client configuration since there is now no intervening proxy. For clients that do not support HTTP proxies, such as some WAP phones, it may be the only workable option. Since the transcoding is coresident with the content, the content provider has tighter control over what is transcoded and how it is presented. Content source transcoding allows transcoding to be done before content is encrypted, and so it can support secure connections. If transcoding is being done to control who sees what data (for example, only allowing users from certain locations full access to data), performing transcoding at the source enforces these views.

The major drawback to content source transcoding is its limited scope. Deploying transcoding in the content source only affects targeted content from that server. It is not appropriate when a client is viewing content from a range of servers. Performing transcoding on the content source server will also impose an additional load on the resources of the server, and so may require additional infrastructure enhancements.

The options for deploying content source transcoding depend on the configuration capabilities of the

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server hosting the content. For this reason, WTP provides two models for content source transcoding:

1. Servlet filtering
2. Transcoding JavaBeans

In the first option the output from an existing servlet or JSP is run through a filter servlet after it is generated. This option allows content generated by servlets to be transcoded without change to the existing servlet. Not all Web servers support servlet filtering, since it is not yet part of the servlet API specification (although this is expected to change). Servlet filtering does, however, enjoy enough widespread support to make it a useful deployment option. WTP requires both the output from the existing servlet and information on the original request to successfully transcode content in this model.

If the Web server does not support servlet filtering, or if more control is desired over the transcoding process, the content provider may wish to or need to explicitly invoke transcoding on generated content. WTP provides JavaBean transcoders that can be used to perform image or text transcoding on data streams.

All Web servers in common use today include extension APIs that allow the requests and responses flowing through the server to be intercepted and modified at various points. A transcoding extension written to these APIs provides another option for content source transcoding. However, since these APIs are Web server specific, they are less portable and more difficult to deploy on a range of platforms. WTP does not currently provide support for deployment at this level.

Application scenarios

Transcoding is used to help make different types of content available in different formats, allowing new applications of the content that may be different from the application for which the content was originally developed. We provide some example application scenarios to describe how transcoding can be used in practice.

Web browsing. One application of transcoding is to make general Web content available to devices with limited or specialized user interfaces. In this application, the transcoding function is deployed as a proxy so that no changes are required to any of the Web servers that are hosting the content. Many of the transcoding functions described above—such as HTML simplification, image transcoding, conversion of HTML to other markup languages like WML, and deck fragmentation—are relevant in constructing this application. Since typical Web pages have many different layouts and semantic information about the type and value of the content is scarce, it may be difficult to create a set of transformations that work well enough for all content of interest. For a Web content transcoding application to work well in practice, it is usually necessary to limit the viewed pages to a selected set and to provide specialized "clippers" that customize the transcoding or clipping for specified content. These provisions allow a great deal of control over how specific pages are transcoded for specific devices.

Rendering vertical XML. We expect more and more content to be published in XML dialects that are specifically designed for a given application domain. These dialects are called "vertical XML" since they are specialized for specific applications. These vertical XML dialects have a great deal of semantic information about the content, but little or no information about how it is to be rendered or displayed. Such rendering information can be defined in XSL stylesheets, and these stylesheets can be applied to the vertical XML dynamically to customize the rendering for specific devices or users at the time the content is delivered. The XSL stylesheet selection and application function discussed earlier are the key operations for this application.

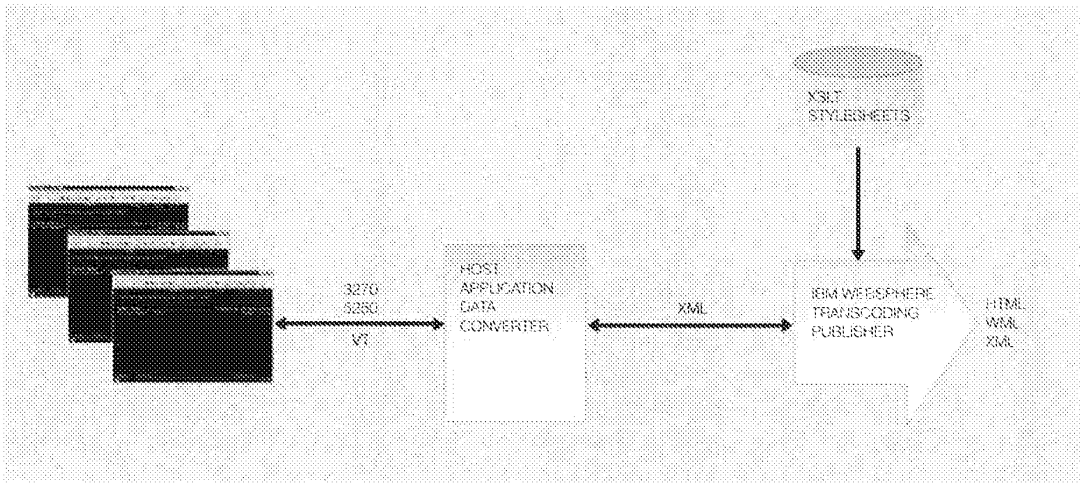
Host integration. An important application of transcoding technology is to leverage the existing investment in legacy applications of an enterprise while extending its reach to pervasive devices and business partners via the Internet. Many companies execute their business processes on host systems (S/390® and AS/400®) running applications that use 3270, 5250, or VT protocols. Original legacy applications were built in an environment where users employed dumb terminals (and later, terminal emulators) to interact with host programs. The potential risks and costs prohibit companies from porting these existing applications to any new technology for "competitive advantage." Using the transcoding technology will enhance host integration solutions for use by a variety of devices and business partners.

Following are several ways to extend the reach of existing host applications to the Internet environment without modifying existing host applications.

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Figure 11 Architecture of the IBM host integration solution



- Develop a downloadable host application emulator using the traditional graphical user interface (GUI) emulator. These emulators are usually Java applets[24] or ActiveX® controls[25] that run inside a desktop browser. This approach does not fit into pervasive devices that do not support Java and ActiveX control.
- Develop a customized user interface by programming against host applications. This approach is sometimes called "screen-scraping." Programmers can write code to interact with host applications and generate a customized user interface for the end user. The customized GUI could be in HTML or WML that can be supported by different devices. The disadvantage of this approach is its cost, since programs have to be written for presentations on different devices.
- Apply transcoding technology as a third approach. First, we convert host application data into a common XML format that is display-independent. Then XSL stylesheets are developed to transform the host application data to different presentation formats that fit into different devices. Figure 11 shows the architecture for this approach. Figure 12 shows an example of a screen from a host application. Figure 13 shows the same screen, transcoded for use on a WAP-enabled phone.

At the design time, the transcoding service is used for stylesheet association, stylesheet deployment, and stylesheet storage. At run time, the transcoding service retrieves the stylesheet and applies the transformation.

There are many advantages to incorporating transcoding technology in a host integration solution. The reengineering of host applications is needed only once. After the XML data have been generated, data transformations can be performed to generate the proper format for different client devices and business partners. Great flexibility comes from the fact that the work of extracting host content is done only once and the host application can be delivered to any type of client by applying a proper style transformation. When new devices are used to access host applications, only new stylesheets need to be developed. The result is quick delivery with a minimum development cost of legacy applications to clients using different devices or to business partners.

Performance considerations

Transcoding a document from one format to another is a computationally intensive operation. To convert HTML to WML or any other format involves parsing the HTML document. Converting an image file from one with the JPG extension (the JPEG, or Joint Photographic Experts Group, format) to one with the GIF (graphics interchange format) extension or lower resolution JPG involves reading and processing the

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Figure 12 Example of an original screen of a host application



entire image and performing floating-point operations on the data.

The payoff is that Web-based files can be viewed by devices that normally would not be able to view those files. An additional benefit for image files is that the resulting file is much smaller than the original file. Sometimes the resulting image is less than one-tenth the size of the original file. This is particularly important if the user is connected over a slow wireless connection.

To handle a large number of end users, Transcoding Publisher employs a variety of methods to distribute the load and reduce the number of transforming documents that it has already transformed.

Transcoding Publisher will use an external cache if it is configured to do so. The cache interface is an industry standard, so any caching product that supports the industry standard will work. When using an external cache, the transcoder attempts to fetch the already-transformed page from the cache. If the page, already transformed for the requesting device, is found in the cache, it is returned to the requester. This fetch operation avoids the potentially costly step of converting the document. If the data are not in the cache, the act of requesting the data through the cache mechanism causes the transformed file to be stored in the cache for the next time data are requested.

Even with an external cache, there will be cache misses. A processor can become saturated transform-

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Figure 13 Example of application in Figure 12 transcoded for presentation on a smart phone



ing documents. Several instances of WebSphere Transcoding Publisher can be run in conjunction with IBM Network Dispatcher,[26] which distributes the load among them. The client devices do not have to know that there is more than one transcoder in the network since they are all configured to use the same proxy Internet Protocol address. With Network Dispatcher, more transcoding computers can be added when a site adds more customers. This permits scaling in a modular fashion.

Benchmarks. There are a number of issues with using existing Web server or Web proxy benchmarks such as WebStone[27] or SPECweb*[28] to evaluate transcoding performance. Those benchmarks were developed with the wired Web and full-function browsers in mind and may not be relevant to the users of small devices with slow Internet access. The audience targeted by Transcoding Publisher is often accessing the Web wirelessly using devices that do not handle the same formats or input devices. The standard Web server and proxy measurement tools assume a certain workload or set of workloads. It is not clear that any of these workloads will be generated by users of pervasive devices. For example, the user of an Internet-capable cellular phone probably does not have the same "think time" characteristics as the user of a desktop Web browser. A desktop browser has a comparatively large screen. Therefore, there is more information to read before another request for a page is required. In contrast, it is difficult to input information on a cellular phone, which may lower the request rate.

The user of a desktop browser with high-speed Internet access often does not think twice about fetching a new page. However, the user of a wireless device will quickly realize that it takes a long time to download data from the Web. This realization is likely to affect usage patterns. For example, someone using a desktop browser will not hesitate to use a search engine to find sites of interest. The user of a cellular phone is more likely to perform one or two simple queries. Cache hit rates may also be affected by different usage patterns. For cellular phones, a larger percentage of requests is likely to be parameterized queries such as "What is the current value of xxx stock?" Since the answer to the query may change every time it is asked, caching is not usually beneficial. Therefore, the mix of simple page fetches to parameterized queries has a big impact on transcoding throughput. Transcoding is sensitive to the type of device that is requesting the information because different transformations are performed for different devices. The standard benchmark tests do not take the requesting device type into account.

The current Web measurement tools need to be changed to include sets of pages that are typically fetched by pervasive devices, an appropriate mix of queries and simple fetches, and an appropriate mix of different devices. Based on these changes, a new set of benchmarks needs to be developed to make it possible to compare competing products, which today present performance information in very different ways. In addition to standard benchmarks, capacity planning algorithms are needed in order to help network designers plan the number of servers required to support certain workloads.

Some performance measurements. Despite the lack of relevant, standardized benchmarks, it is still necessary to have some idea of the capacity of the Transcoding Publisher. To do this, the WebStone source was modified to send the HTTP headers that

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Table 2 Performance measurements made on an RS/6000 44P Model 270, 375 MHz processor with 2GB RAM running AIX; Java tuning parameters: ms = 256, mx = 512

Test Case	Number of Processors	Number of Concurrent Users	Response Time	Throughput (megabits/sec)	Pages/Sec
WAP clients only (HTML to WML; 1K to 3K size text files; no images)	1	1000	4.32	.33	22.97
	2	1400	4.26	.46	32.58
	4	2000	3.93	.72	50.43
PDA clients only (HTML simplification; 1K to 3K size text files; images up to 16K)	1	1300	4.38	.61	29.44
	2	1600	4.05	.81	39.13
	4	2500	4.15	1.24	59.77

the transcoder uses to identify different devices. Workloads were also defined that might be typical for users of devices that have small screens and slow Internet connections.

In Table 2, the results for two scenarios are shown: a WAP scenario and a Palm Pilot** scenario. For the WAP scenario, all the clients are WAP phones fetching HTML pages. The HTML pages range from 1000 to 3000 bytes. No images are fetched. For the Palm Pilot scenario, all the clients are Palm Pilot devices. The same HTML pages are fetched as in the WAP scenario. In addition, some images (JPG and GIF) are fetched. They range from 500 bytes to 16000 bytes. Images are fetched one-tenth as frequently as HTML.

The table shows the number of users that can be supported while maintaining a four-second response time. All measurements were made on single-processor, and two-way and four-way multiprocessor IBM RS/6000* systems running the Advanced Interactive Executive (AIX*) 4.3.3 operating system. Version 1.1.2 of Transcoding Publisher was tested.

Because WebStone clients have no think time, the tests tend to drive processor utilization very high, and the apparent scalability is less than we expected. In other experiments we added up to 15 seconds think time between requests. For those runs, the scaling from one to two to four processors was almost linear. The results shown here are for the zero think time test. The number of concurrent users is an estimate of how many real users (who do think about or read a page before requesting another) can be using the system concurrently.

Related work

There are several commercial products and research prototypes whose capabilities are similar to that provided by IBM WebSphere Transcoding Publisher.[29] In this section we describe these systems.

The ProxiNet** transcoding engine[30] focuses on delivering existing Web (i.e., HTML) information to mobile handheld devices. It uses an ultra-thin client and relies on a middle tier to perform any necessary transcoding.[31] The ProxiNet engine can filter out content not compatible with the capabilities of a handheld device, reformat HTML tables and frames as lists, and transcode images for these devices by performing color depth reduction and scaling.

The Spyglass Prism** transcoding engine[32] also supports the transcoding of existing Web content for Web-enabled non-PC devices. The Spyglass Prism engine is server-based and translates richly formatted Web content such as tables, JPEGs, and frames into formats that match the relatively limited display capabilities of non-PC devices. The engine is also capable of transcoding images for these devices by performing color depth reduction and scaling. In addition, Spyglass Prism is capable of transcoding HTML to WML.

The Online Anywhere transcoding engine is capable of transforming content to a variety of information appliances, including Web-connected TVs, PDAs, wireless devices (pagers, data phones), and voice-only products.

A *portal* is a gateway that serves as a starting site from which a user begins Web-browsing activity. There

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are general portals such as the Netscape and Yahoo!** Web sites, as well as specialized portals such as Garden.com for gardeners and Fool.com for investors. Typically, a portal has many links to many other Web sites. Portals can be a significant source of revenue because of income provided by selling advertising space (e.g., for banner advertisements) on the portal site or payments received for directing significant user traffic to other sites from the portal.

A portal can also provide a means to provide access to transcoded content. That is, it can serve as a starting point for a set of sites, all of which have been transcoded for a certain class of devices. For example, one can design a WML portal as a starting point to sites that have been transcoded for WML devices. Rather than having to transcode all possible HTML (Web) sites, one can then limit the number of pages that need to be transcoded into WML to those pages that are accessible from the portal. WTP can be used to implement such portals, for example, by using dynamic transcoding in conjunction with *text clippers* for those sites that can be accessed from the portal. There are other products in the marketplace, such as the Oracle Portal-to-Go**, that provide support for generating such portals, especially for wireless devices.

Han et al.[33] present an analytical framework for determining whether to transcode and how much to transcode an image for the two cases of store-and-forward transcoding as well as streamed transcoding, and also provide practical adaptation policies based upon transcoding delay, transcoded image size (in bytes), and the estimation of network bandwidth.

The InfoPyramid transcoding engine[34,35] is capable of transcoding content to a variety of client devices. InfoPyramid is able to perform transformations on images, video, text (i.e., HTML), and audio to reduce the amount of content sent to client devices. In addition, InfoPyramid can also perform modality-based transformations. InfoPyramid can convert video to images, video to audio, video to text, text to audio, and audio to text.

Conclusions and future work

As new types of devices become more prevalent, the need to adapt existing content for display on a variety of devices is becoming greater. The techniques presented in this paper are valuable in constructing solutions that reuse existing content for the new applications that are made possible by the new device and network types. We expect these technologies to continue to evolve to address more applications and environments and to make it easier to customize the solutions. The extensive use of standards such as HTML, XML, and the Java language has been a key factor in enabling us to quickly build and deliver a product—WebSphere Transcoding Publisher—that incorporates these technologies and delivers on the promised value.

There are several aspects of WebSphere Transcoding Publisher that are excellent avenues for future work. Transcoding Publisher currently does not provide automatic conversion of HTML content to a format suitable for voice-recognition-based browsers. Providing this type of function (e.g., HTML to VoiceXML conversion) would enable Transcoding Publisher to reach a greater range of devices.

The ability of Transcoding Publisher to transform content in a variety of ways could be leveraged to adapt content to enable it to be more suitable for users who have accessibility issues. For example, Transcoding Publisher could be used to increase the font size of content to enable it to be read by users with limited vision capabilities, and content could be modified such that it was presented in a simpler form, thus making it suitable for users with attention deficit disorder or dyslexia.

The clipping and transformation capabilities of Transcoding Publisher are well suited for the creation of portals for wireless devices. Adapting Transcoding Publisher to serve in this capacity is a valuable avenue for related work.

Transcoding Publisher currently relies upon user agent identifiers transmitted by browsers to determine the capabilities of the client. As more formal methodologies for sending information regarding client capabilities such as CC/PP mature, the policies of Transcoding Publisher for determining how to transcode for a device should be updated to exploit this detailed description of capabilities.

Transcoding Publisher could be extended to dynamically adapt its transcoding policies as the environment in which it is being used changes over time. For example, image reduction policies could change when network bandwidth is suddenly reduced.

Finally, Transcoding Publisher needs to be extended to support emerging formats such as the MPEG-7 (Moving Picture Experts Group) multimedia format

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to allow it to continue to provide first-class support for cutting-edge wireless devices.

In addition to functional enhancements, it would be useful for comparing the performance of different products if standardized performance benchmarks for mobile devices accessing the Internet were developed.

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**Trademark or registered trademark of Sun Microsystems, Inc., Massachusetts Institute of Technology, Netscape Communications Corporation, Microsoft Corporation, Standard Performance Evaluation Corporation, Palm, Inc., ProxiNet, Inc., OpenTV, Inc., Yahoo! Inc., or Oracle Corporation.

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UNIVERSAL MULTIMEDIA ACCESS FROM WIRED AND WIRELESS SYSTEMS*

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Abstract. Personal computing and communication devices such as computers, personal digital assistants (PDAs), and mobile phones are moving to their next generation in which the end user will be able to access a multitude of information with a single device either locally or through a network. One likely trend in future personal computing and personal communication is that there will not be a single but several equivalent devices available to users allowing access to information in various forms. Each user, depending on his/her needs would access one or several among them depending on the situation and his/her preference. Using existing protocol mechanisms, in this case, a mapping and negotiation of resources during connection setup would be performed, which would remain in place throughout the life of the connection.

This paper provides an overview of universal multimedia access (UMA), a concept for accessing multimedia content through a variety of possible schemes, and discusses some of the issues that arise regarding its deployment. In particular, UMA will provide a solution for adapting the delivered content when users attempt to access their choice irrespective of their terminal characteristics and communication infrastructure, as opposed to the assumption that the content remains fixed and the objective is to deliver the original content at all times. This recognition represents the impetus for the development of media descriptions and hence UMA; that is, the notion that valuable information can be derived from a variety of conversions of a multimedia content source.

The issues discussed are future requirements on content servers and multimedia viewers, media conversions, UMA protocols, and UMA network architectures. The problems addressed are quality of service issues in network solutions for multimedia communications

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and reconfigurable architectures and network control based on source adaptations through media conversions and transcoding.
Key words: Multimedia communications, media description, transcoding.

1. Introduction

The state of the art in distribution of rich multimedia content has been brought forward by the deployment of the Internet and digital TV. The Internet carries all kinds of audiovisual information in a wealth of formats and rates. Standardization efforts of the International Standards Organization (ISO) have given us the JPEG family for still image coding, and the Moving Pictures Experts Group (MPEG) family for audiovisual coding and manipulation in digital TV services. The International Telecommunications Union (ITU) and other independent bodies bring similar telecommunications standards forward.

The MPEG family of standards deals with the representation, compression, and transport (MPEG-1, MPEG-2) as well as the manipulation (MPEG-4) of audiovisual information. MPEG-7 [24] is to deal with the semantics-based representation of content, which will enable management of multimedia in a broad sense. The main objective of the MPEG-7 standard is to include additional information to describe multimedia content. Such additional information is usually referred to as meta data. In this paper, we use the term "descriptions" to avoid any confusion with different definitions of meta data used in other contexts. The description schemes are defined using a special language called the Description Definition Language (DDL), also part of the standard. The latter is an extension of the Extensible Markup Language (XML).

Universal multimedia access (UMA) [26] deals with the delivery of images, video, audio, and multimedia content under different network conditions, user and publisher preferences, and capabilities of terminal devices. A major motivation behind UMA is to enable terminals with limited communication, processing, storage, and display capabilities to access rich multimedia content. UMA presents a solution for wired and wireless clients to access the same content server, each receiving content enabled for their client's capabilities. UMA is an important class of applications considered under the MPEG-7 framework, dealing with, among other topics, media conversion and linking MPEG-7 to real-life applications, such as multimedia communications over a large range of platforms and access technologies. This again will ensure that content generators are not faced with generating various versions of the same content and its synchronization whenever an update is necessary.

The concept of media conversions [4] suits the next-generation mobile and wireless systems, as seen in the developments of third generation systems such as the European Universal Mobile Telecommunications System (UMTS) [2], [9] and the efforts of the Third Generation Project Partnership (3GPP) [3], [27]. For

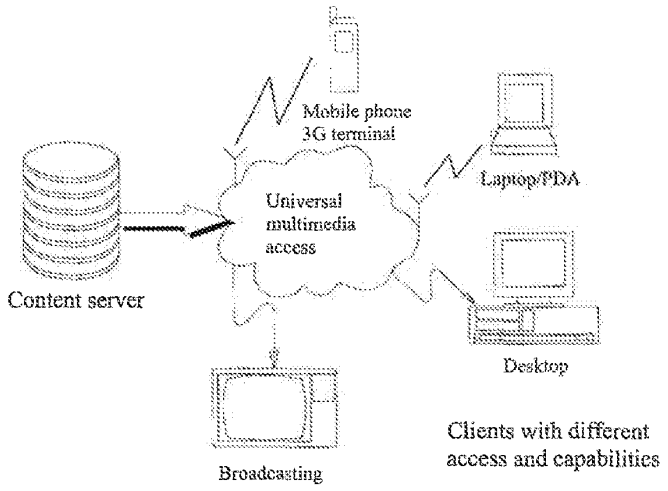


Figure 1. The UMA concept.

these applications, UMA will enable users access to future services independently on their choice of access technology, terminal equipment, and usage preferences.

2. The UMA concept

The UMA concept [5], [1], [7] is visualized in Figure 1.

UMA is truly multidisciplinary, involving multimedia signal processing, digital communications, radio systems, and telematics. Multimedia signal processing is essential in ensuring that the transmitted information is suitable and prepared for the communications system. Digital communications is essential in that the information has to be compressed to save bandwidth, high-level channel encoded for protection against noise in the channel, modulated to suit the physical channel, and multiplexed to allow for multiple access of the shared resources. This information passes through the radio system and is input to the network. Assuming a packet network, it will deliver the packets to the receiver according to the given protocol stack. The packet is affected by the network traffic and also by the quality of service (QoS) scheme defined for this specific network and client. Finally, the information is presented to the viewer at the receiving end. The UMA concept covers the universal access to multimedia information through this complete system.

The multimedia content for UMA-enabled systems first needs to be analyzed and then possibly converted to suit the different telecommunications requirements and access technologies. Analysis is the part of the system that describes the multimedia content, and the conversion is the part that adapts the content to different client capabilities given by the terminal and the telecommunication sys-

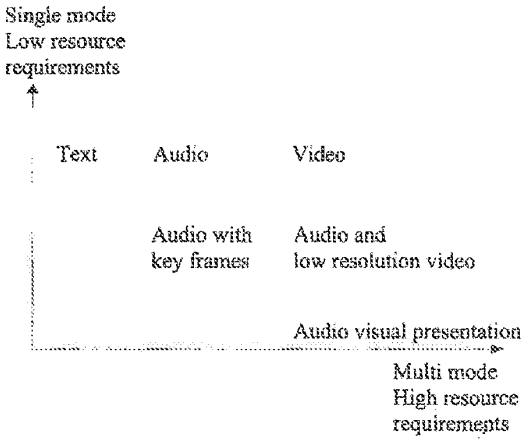


Figure 2. UMA media conversion space.

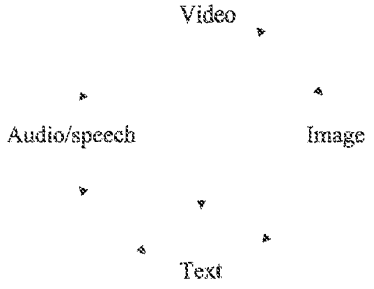


Figure 3. Modality changes for an audiovisual signal.

tem. Content conversions can be done prior to a client request or instantaneously subsequent to a request, depending on network configurations and protocol use.

3. Content servers for UMA-enabled systems

Figure 2 shows several different types of some of the possible media conversions you would expect a UMA client to be able to receive.

To be able to adapt this content to the different terminals, we can take two approaches. The first is to create conversions of the visual information by scaling the spatial or temporal resolutions. The second alternative is more complex and includes converting from one multimedia format (or modality) to another. Figure 3 shows possible modality changes. A multimedia presentation usually consists of combinations of the four main modalities; video, audio/speech, text, and images.

Channel bandwidth requirements will vary for different modalities. A video sequence usually has higher channel requirements than a presentation containing

Table 1. Typical client requirements for different modalities

Modality	Typical	Requirements
Video	Original video including audio	2 240 kbps, time critical
Images and audio	20 images and CD-quality audio	240 kbps audio, time critical 500 kbps visual, non-time critical
Images and speech	10 images and telephone quality speech	8 kbps speech, time critical 250 kbps image, non-time critical
Images and text	Two A4 pages of news including imagery	100 kbps, non-time critical
Text only	Four A4 pages	10 kbps, non-time critical

only text. This can be made scalable by combinations of different modalities. All of these possible combinations will require some conversion of the original multimedia content along with techniques to change from one modality to another. These new multimedia presentations will, like the original presentation, be time critical. The audio/speech sequence requires a minimum bandwidth to avoid stops in the sound. Images and video require a minimum bandwidth and channel quality to ensure QoS and also to meet client preferences on time delays [22]. The delay relates to the size of the imagery, which must, in one way or another, match the channel capabilities so that the transmission time does not exceed a certain limit. This limit will specify how long the client is willing to wait to get all the images and will be a trade-off with the received quality of the content.

Examples of modality changes are bandwidth reduction by speech extraction from the audio sequence and presenting this as a text string, extraction of a number of key frames of a video sequence, adapting the spatial size of the content, varying compression ratios and/or color schemes, or audio quality adjustments. Conversion from video to images and text includes almost the same operations as conversion from video to images and audio, as well as a speech-to-text conversion or a text-summarization process. Conversion tools range from key frame extraction, speech recognition, transcoding, and speech and image recognition summary generation based on the information given in the media descriptions.

Table 1 gives some examples of typical channel requirements for different modalities.

3.1. Viewer requirements

The UMA concept will place certain requirements on the multimedia viewers, such as:

(a) Being able to buffer a given amount of data to prevent frame delays during small channel variations when the channel characteristic changes dynamically. Commercial viewers use this today; the problem is how to take control of the buffer based on dynamic channel and network feedback.
(b) Being able to use a media description annotation to automatically extract media conversions from an original sequence. This should be done instantaneously and continuously, or alternatively the media descriptor can be as simple as a pointer to the correct conversion of the content on the server.
(c) Being able to provide adequate control over the streaming of the content, including fast response to changes in channel bandwidth, automated presentation of changing frame rates, and zoom functionalities.
(d) Being able to provide adequate support for negotiation procedures during time variations in channel conditions and access schemes (also for initial setup).

3.2. Media conversions

One of the important issues in access to multimedia content across platforms and terminal capabilities is media conversion. It consists of converting the original data to different modalities and resolution versions. One can classify media conversion methods according to different aspects. For example, depending on the output of the conversion, the following methods could be identified.

(a) *Scaling*. Here the original data is transcoded, manipulated, and compressed so that its size and data rate are reduced. Representative examples are image size reduction, video frame-rate reduction [12], and color reduction.
(b) *Translation*. Here the different media objects (image, video, text) present in the content are transformed from one modality to another. Examples of translation include text-to-speech (TTS) conversion, speech-to-text conversion (speech recognition), video-to-image (video mosaicking [29]), and image-to-text (optical character recognition).
(c) *Summarization*. Here the most relevant information is extracted from the original data. Examples of summarization are key audio clips and key frame-based summary [1]. The key frames could be organized in a sequential or hierarchical way.

Another way to classify media conversion methods depends on where they are performed—at the client, at the server, or at the proxy. Because the computational power, link bandwidth, and the storage capabilities of the client devices are often

limited, the transformation of the content at the client side is usually impractical. The use of an intermediate proxy makes the conversion of the data more efficient. However, the content providers may not have control over how their content will appear at different clients. Finally, it is possible to perform the conversion at the server side. In this way, the content provider can control the converted media and avoid problems faced by the proxy approach such as copyright-related issues.

Furthermore, the media conversion can be performed offline or "on the fly". The proxy-based media conversions must be immediate. However, this requirement is difficult to meet due to high complexity, particularly conversions related to video. Mohan *et al.* [18] proposed to use a representation scheme called InfoPyramid, which describes the audiovisual data in a multimodal, multiresolution hierarchy. It is a server-based, offline media conversion method. The InfoPyramid delivers dynamically converted versions of the original data according to the user preferences and the client device capabilities. In [10] a proxy-based media conversion is presented, based on translations such as image compression and video frame-rate reduction.

4. Network and UMA deployment

Downloading multimedia data involves capability negotiation between clients and servers or clients and gateways. This type of negotiation is supported in many media standards. As an example, in a videoconference application, terminals exchange capabilities and agree on a common mode of operation. If H.323 [3], [4] is the protocol used in this application, the two terminals negotiate which format of the video coding algorithm (H.261 or H.263) and which of the spatial dimensions to use: 352×288 as defined for CIF or 176×144 as defined for QCIF. If one terminal supports both CIF and QCIF resolution, and the other supports only QCIF, naturally QCIF will be used. The audio codec chosen must also be negotiated, e.g., for G.729 or G.723.

If video is transmitted between groups of users with different terminal or network capabilities, the need for converting one type of compressed signal into another type of compressed signal format through transcoding arises. The device that performs this operation is called a transcoder. A transcoder can also adapt to user preferences and capabilities. For example, in UMA applications, some users might be able to receive low-frame-rate video, while others can receive high frame rates. The transcoder can convert the video accordingly. In other words, the high-quality video will still be exchanged between users with the appropriate capability.

An alternative to video transcoding is scalable video coding, which MPEG-2, MPEG-4, H.323, and H.263 support. Scalable video coding allows for recovery of appropriate subsets of video bit streams to generate complete pictures of resolution with the proportion of the bit stream decoded. For example, let us

assume that R1 is 64 kilobits/second (kbps) and R2 is 128 kbps. Then, the base layer in the encoded bit stream would be R1, and the enhancement layer, containing higher-resolution information, would be R2.

The problem with scalable video coding is that it adds complexity to the system because it must produce as many layers as different preferences and clients exist in the network. Usually, a limited number of layers are generated, which might cause problems in a UMA application where various clients can coexist. On the other hand, video transcoding adds complexity and delays in the network, which might create a problem in real-time communication systems. It is evident that a combination of scalable coding and transcoding must coexist for efficiency.

5. Protocol requirements and network architectures for UMA

5.1. UMA protocol requirements

The UMA concept deployed in a heterogeneous network environment leads to what can be considered as "smart content" and hence will lead to "smart content servers". This means that network operators and service providers will be able to tailor content from an original source to a plethora of user devices with possibly widely varying characteristics as well as different network access communication links. New or modified protocols are required to enable full exploitation of the envisaged smart content.

Existing protocol mechanisms are available [11], [13], [14], [25] wherein a mapping can be determined between applications, the user terminal devices, and network requirements. For instance, the ITU H.323 protocol [13] provides a foundation for multimedia communications across IP-based networks (such as the Internet). Indeed, H.323 is designed to run on top of common network architectures, and, more importantly, it is not tied to any hardware or operating system. H.323 encompasses four major elements of a networked-based communications system [13]: terminals, gateways, gatekeepers, and multipoint control units. Note that all H.323 terminals must also support H.245 [14]; the latter is used to negotiate channel usage and capabilities. Similarly, the Internet Engineering Task Force (IETF) has developed the Session Initiation Protocol (SIP) [11], [25], which is an application-layer control signaling protocol for creating, modifying, and terminating multimedia sessions with one or more participants.

The above mapping and negotiation is usually established during connection setup and remains in place throughout the life of a connection. SIP provides the capability to change the parameters of an existing session; however, such a change is targeted at the case when a third party wishes to join or exit a multicast session. Ultimately, the performance of these existing protocol mechanisms [11], [13], [14], [25] depends on stochastic dynamic variations of telecommunication

channel characteristics, such as errors, delay jitter, and network congestion. In general, this problem has been solved by conservatively dimensioning the bandwidth buffer requirements as well as by the deployment of traffic management mechanisms. An implicit assumption is that the content remains fixed, and the objective is always to deliver the original content at all times. The fallacy in this approach is that there is wide recognition whereby users will demand access to content irrespective of their terminal characteristics and communication infrastructure. In other words, there is a natural demand for content even if it is scaled down from the original version; for instance, even if some of the individual media streams associated with a particular multimedia content source are not maintained through the media conversions before final delivery. This recognition represents the impetus for the development of media descriptions and hence UMA; that is, the notion that valuable information can be derived from a variety of conversions of a multimedia content source.

The development of smart content and smart content servers alone will not solve the issue of delivering the required flexible service to customers. New or modified protocols are essential and necessary to first establish and then map the various requirements between the user terminal equipment, the communication network access bandwidth, and other limitations, and finally, the optimal level of media conversions if deemed necessary. In other words, content-level parameters need to be taken into account. Further, and perhaps more importantly, the protocol is required to monitor the channel conditions such that an adequate and acceptable level of service is maintained through the life of the session. The latter requirements raise a number of interesting issues, e.g.:

1. What is the most appropriate time scale for monitoring of channel parameters such as errors, delay, and delay jitter? The impact that these parameters will have on the various levels of content delivery is unknown. The necessary interactions between the various communication layers will also need to be determined. For instance, the application layers will need information about lower layers and channel conditions in order to properly and adequately cater for the content variation of the media conversion.
2. There is a need to establish the threshold levels whereby media conversion is deemed necessary. Critical to this is the issue of response time and inherent communication delay between the user and the server within the network. There will also need to be a negotiation between network requirements and specified usage preferences.
3. In terms of deployment, consideration should be given to the media conversion scalability and dimensioning of the UMA content server to the available infrastructure.

These issues largely relate to QoS and what this means from a UMA application point of view. The UMA concept attempts to provide some mechanisms for maintaining a certain level of QoS even as network and other user behavior

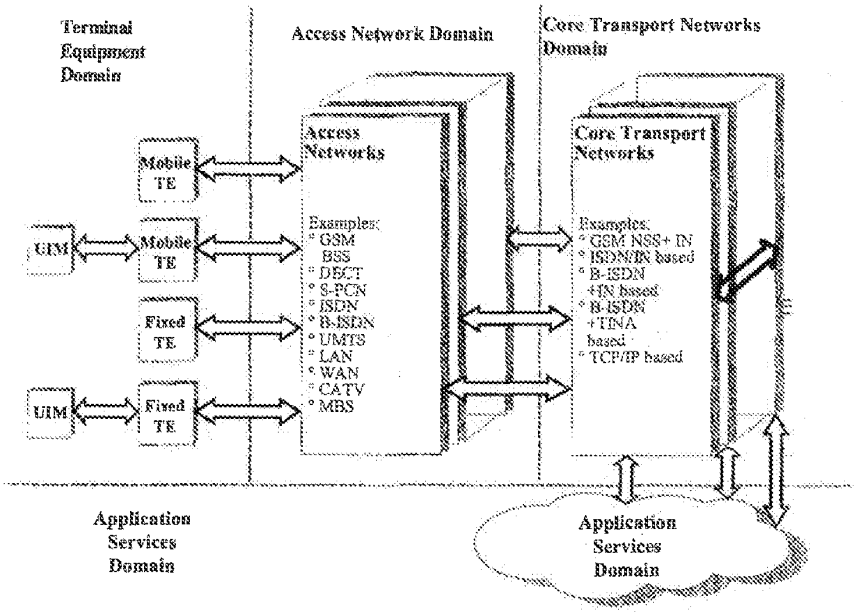


Figure 4. GMM communications system: Conceptual model of network architecture.

changes. However, tailoring QoS to individual multimedia content sources and usage requirements remains an open research question that is being addressed within the UMA test bed.

Finally, human interface factors such as user requirements and usage preference need to be addressed. The process of capturing a particular user's preferences and requirements is an important area for further consideration. For example, the knowledge of whether a user has a preference for a certain modality of the multimedia content, say audio rather than visual, has a strong bearing on the choice of media conversion. How this information is captured and whether it changes depending on the application clearly represents an open issue.

5.2. Network architectures for UMA

One capability of UMA is to provide a seamless interface between the wired and the wireless world. UMA makes this hidden from the client and extends the client's capabilities of staying connected regardless of access point and also provides the necessary mobility. This is very much along the lines of international work on the next-generation infrastructure, such as the Global Multimedia Mobility (GMM) work of ETSI [8] and also in the development of the Global Information Infrastructure (GII) [16].

The GMM architecture is shown in Figure 4 (from [8]).

This relates closely to UMA, as it will be supported, not by one system, but by a

set of systems and subsystems working together to provide the UMA capabilities. The GMM communications systems can be built from different combinations of current and future systems and subsystems. Therefore, the approach is not to define a single unique architecture but rather a framework within which different elements can coexist and work together.

It is stated in [8] that the network architectures for GMM communication systems should meet the following objectives:

(a) Cope with a diversity of services to be supported.
(b) Enable service provision by a large diversity of network operators and service providers ranging from global carriers to local specialized service providers.
(c) Allow the same application to be transparently accessible from different terminal equipment.
(d) Offer services in different environments, depending on local conditions.

Therefore the GMM network architectures comprise four conceptual domains (Figure 4). These are:

(1) Terminal equipment
(2) Access networks
(3) Core transport networks (including intelligence)
(4) Application services

UMA communication systems can be built in various ways using different combinations of elements from the four domains introduced above. As an example, consider the scenario where the user is involved in a training-on-demand program at work and has his desktop PC at work and a mobile device with a small screen and 144 kbps access available while traveling home. The program demands that work be continued outside the office and thus the GMM structure and UMA concept will ensure that the interface between the terminal equipment domain and access network domain in Figure 4 is seamless by the use of media conversions based on the description of the content. The interface between the access network domain and the Core transport networks domain is dependent on the available infrastructure and will be an input parameter in the description of the content, e.g., by giving hints on the transcoding to be used depending on error or delay characteristics. The final interface to the applications services domain will reflect on the choice and design of the multimedia viewers.

Issues to be determined are on the use of the Internet Protocol (IP) environment in the architecture, the envisaged user requirements, and influence of their usage preferences (human interface factors), scalability and transcoding for network deployment (media conversions), adequacy of content media bases and the placement of these.

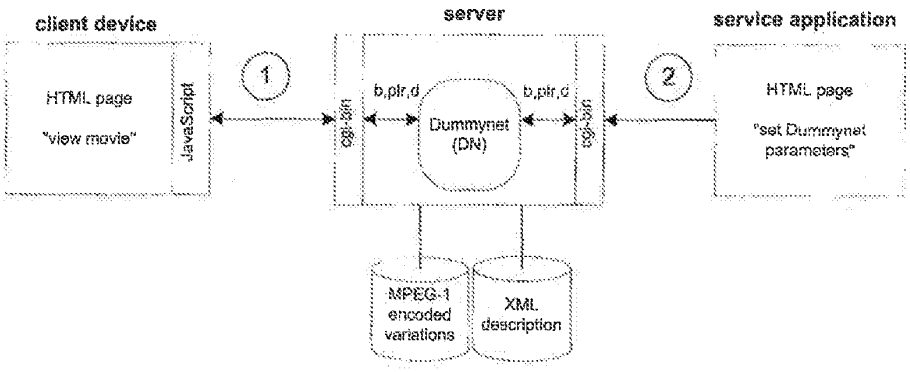


Figure 5. Test bed for validating the UMA concept.

6. UMA test bed

A UMA test bed is under development [2], [17], [23], [28], intended to serve as a media research engine for the UMA concept. It consists of a server including several conversions of MPEG-1-encoded content, a network simulation application, and three client computers. The different media are described using the MPEG-7 description schemes coded in XML [19]–[21].

The client/server network environment for the UMA concept is visualized in Figure 5.

The router in the network is running DummyNet (DN) [6]. DummyNet is a flexible tool for bandwidth management and for testing networking protocols such as IP. DummyNet works by intercepting packets in their way through the protocol stack and passing them through one or more channels that simulate the effects of bandwidth limitations, propagation delays, bounded-size queues, packet losses, etc. Each channel can be configured separately, and packets are forwarded to the appropriate channel using a packet filter. Hence we will be able to apply different limitations/delays to different traffic according to the specified filter rules (dynamic variations can be applied to channel bandwidth, propagation delays, and packet loss; these can be either deterministic or statistical).

6.1. Data access

The content server is currently running an Apache Hypertext Transfer Protocol (HTTP) server allowing the content to be easily accessed by the clients. The test bed operation consists of two Hypertext Markup Language (HTML) pages, which connect to the server/DummyNet through a JavaScript and plain HTML code, respectively. It also includes two different scripts, which set and read the DummyNet parameters.

The media conversions are accessed from the clients through an HTML page.

The most suitable content for the client's capabilities is selected through a JavaScript in this HTML page. This page performs a search through the content descriptions and presents the correct one to the client. Control of the DummyNet parameters is with an HTML page, which sets the transport condition through a script.

The dynamics of the test bed are through signal flows 1 and 2, as indicated in Figure 5. Signal flow 1 is the signal flow between the service application and the server, whereas signal flow 2 is the control signal flow setting the DummyNet parameters (bandwidth, packet loss ratio, and delay). After these parameters are set, and whenever they change, they are sent to the server through a script. The client device requests for the bandwidth parameter prior to presenting the content.

When the user requests for content, a script is invoked, which requests the actual bandwidth parameters. The parameters are read from the server, and a new HTML page is created instantaneoulsy, where a JavaScript requests for the XML code containing the media descriptions. The search decides which media conversion is the most suitable for the client. For example, this could be the conversion with the highest fidelity measure, but still meeting the channel constraints as read from DummyNet. The JavaScript finally sends a request to the server for the selected content, which is played back to the user through the Windows Media Player (as an ActiveX component in the HTML page).

6.2. *Viewers*

Each of the UMA clients can run a viewer. Currently, in the test bed, it is possible to stream MPEG data, i.e., play the movie while it is downloading, rather than first download the whole movie and then play it. The clients are currently running the InterVU player [15] and the Windows Media Player [30] for MPEG-1 encoded data.

6.3. *Example of MPEG-7 annotations using the Variation Description Scheme*

Figure 6 shows the use of the proposed MPEG-7 Variation Description Scheme within our test bed [23].

The concept of Figure 6 assumes a mechanism within UMA for negotiation of client terminal capabilities—in this case, its available bandwidth. This provides the parameter vector b_i, which is input to the description schemes. The bandwidth b_i is then compared to all of the available variations of the content through comparing b_i to the description for media conversion P_m. The media conversion will access the original MPEG-1 encoded content and output P_m, which is the most suitable conversion of the original content according to the client's terminal bandwidth.

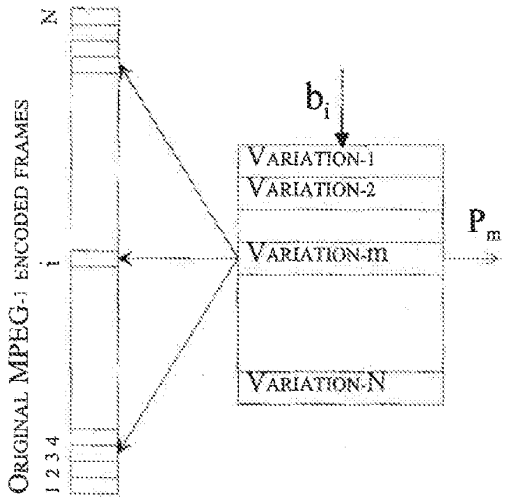


Figure 6. Use of the Variation Description Scheme in the UMA concept.

In the example, the media conversion is in the form of an extraction of key frames according to their significance in the sequence [3], [4]. The UMA test bed is set up to dynamically change the bandwidths to each of the clients connected to the network to be able to simulate the expected dynamics of a real scenario. The media conversion will at any given instance pick these frames from the original MPEG-1 encoded content database for transmission to the client.

7. Conclusions

UMA gives the basis for the future of efficient multimedia communications, providing the concept of "Multimedia anytime, anywhere". UMA provides a seamless access to multimedia information over wired and wireless systems. The merger of telecommunication systems with the MPEG-7 Descriptors and Description Schemes of multimedia content provides the mechanisms for maintaining an effective connection regardless of communication resources. MPEG-7 enables storing the content as a single entity, using the descriptions to select the appropriate content for the client's capabilities. The mechanism is based on media conversions, selecting a conversion suitable for the given requirements.

A test bed is under development, providing insight on the following issues for future research:

- Simulations with visual quality comparisons between different conversions for different client terminal capabilities, necessitating tables with descriptions of content according to certain channel conditions using conversions

of the original content. These descriptions have to be formalized, e.g., by using the DDL as proposed by MPEG-7.

- Necessary requirements for multimedia viewers in order to handle the concept of UMA.
- Requirements on content servers, noting that content no longer has to be stored on servers in a large set of formats suitable for any client. In fact, media conversion operations will be performed in transcoders that reside in gateways in the network. The main idea is that an MPEG-7 client will exchange its capabilities using the MPEG-7 descriptions, thus negotiating conditions with the server on establishment of connection and revising these during the connection.
- Necessary UMA protocol requirements establishing a mechanism for ensuring seamlessness when moving from one environment to the next, such as going from a wired access to a wireless access while viewing multimedia content.
- Discussions on a UMA architecture linking this to the GMM architecture and GII. This architecture allows for an evolution of existing systems in coexistence with new systems. The new systems just act as new additions in the flora of building blocks available for the user at any time and location.

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Adapting Multimedia Internet Content for Universal Access

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***Abstract*—Content delivery over the Internet needs to address both the multimedia nature of the content and the capabilities of the diverse client platforms the content is being delivered to. We present a system that adapts multimedia Web documents to optimally match the capabilities of the client device requesting it. This system has two key components. 1) A representation scheme called the *InfoPyramid* that provides a multimodal, multiresolution representation hierarchy for multimedia. 2) A *customizer* that selects the best content representation to meet the client capabilities while delivering the most value.**

We model the selection process as a resource allocation problem in a generalized rate-distortion framework. In this framework, we address the issue of both multiple media types in a Web document and multiple resource types at the client. We extend this framework to allow prioritization on the content items in a Web document. We illustrate our content adaptation technique with a web server that adapts multimedia news stories to clients as diverse as workstations, PDA's and cellular phones.

***Index Terms*—Compression, content adaptation, Internet, multimedia, information appliances, rate-distortion, transcoding, universal access.**

I. Introduction

NETWORK appliances, or information appliances, are computing devices that are network enabled. They typically have fewer resources than personal computers and are geared toward a limited number of applications. Some current examples of network appliances are hand-held computers (HPC's), personal digital assistants (PDA's), set-top boxes, screen telephones, smart cellular phones and network computers. In "ubiquitous" or "pervasive" computing, consumers will use different network appliances to connect to the Internet for different applications, from entertainment to banking, from different settings, from living rooms to cars. Sources, such as *The Economist* [1] and International Data Corporation (IDC) [2], predict that the sales of network appliances will significantly outstrip that of personal computers after the year 2002. Therefore, within a decade, network appliances will replace personal computers as the client device of choice for viewing Web content.

Currently multimedia content is authored with the personal computer as the target client device. Web documents, which have rapidly become the largest deployed form of multimedia, are also authored specifically for personal computers with reasonable wired network connections. However, network appliances are very different from the typical PC on a modem or LAN. The network appliances vary widely in their features such as screen size, resolution, color depth, computing power, storage and software. They also use a variety of network connections ranging from cable to mobile, with different bandwidth, connection characteristics and costs [7]. The diversity of these devices will make it difficult and expensive to author multimedia content separately for each individual type of device. Therefore, technologies that can adapt multimedia content to diverse client devices will become critical in the coming pervasive computing era.

In this paper we present a system that **adapts** multimedia Web content to optimally match the resources and capabilities of diverse client devices. This system employs two key technologies.

1) A progressive data representation scheme called the **InfoPyramid** [25]. Content items on a Web page are transcoded into multiple resolution and modality versions so that they can be rendered on different devices. For example, a video item is transcoded in to a set of images so that it can be rendered on a device not capable of displaying video. The InfoPyramid provides a multimodal, multiresolution representation for the content items and their transcoded versions.
2) A **customizer** that selects the best versions of content items from the InfoPyramids to meet the client resources while delivering the most "value." The customizer allocates resources on the client among the items in the document. This resource allocation results in the selection of the appropriate resolution or modality of the content items. If the client has limited resources (such as a PDA or pager), some of the content items may not get any resources assigned and thus will not be delivered to the client. We propose a novel *value-resource* framework for the customizer. This value-resource framework allows us to design and analyze a number of content adaptation strategies.

We illustrate this content adaptation with a multimedia news delivery system that adapts to clients ranging from workstations to cellular phones.

A. Related Work

Much work (for a small sampling, see [3]–[6]) has been done on adapting video to bandwidth variations by selecting a suitable compression scheme. These systems consider only a single type of media, not composite multimedia documents.

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Drastically different clients, such as those that cannot handle video, are not addressed.

Web content adaptation can be performed either at the server, at the client, at an intermediate proxy, or some combination of the three.

Some client devices adapt content at the device. For example, Windows-CE™ devices change color-depth (for example, from 24-bit color to 4-bit gray-level) of images. The drawbacks are that network appliances have low network bandwidth, which results in slow access to pages with rich multimedia, and they are restricted in their computational power, which makes content adaptation at the device slow, or even impossible.

Most content adaptation systems [7]–[16], [18] are http proxy-based. The proxy intercepts client device's requests for Web pages, fetches the requested content, adapts it, and sends the adapted version to the client. This content adaptation is often termed "*transcoding*."

In the TranSend project [7]–[10] a proxy transcodes Web content on the fly. The adaptation, which they term "distillation," is primarily limited to image compression and reduction of image size and color space. Video is also converted into different frame-rates and encodings using a video gateway [6]. Based on this work, a company, Proxinet [16], has been started that provides a proxy which customizes content for a special browser on the 3Com PalmPilot™ [17].

Bickmore and Schilit [11] also propose a proxy based mechanism. They use a number of heuristics and a planner to perform outlining and elision of the content to fit the Web page on the client's screen.

The Spyglass Prism™ [13], a commercial product, is another transcoding proxy. AvantGo [18] offers a solution similar to Proxinet.

Content adaptation upstream of the client results in a faster response time [7], [8]. Based on this observation, Intel launched the QuickWeb™ [12] service that compresses images at a proxy.

These transcoding proxies typically consider a few client devices and employ static, *ad-hoc*, content adaptation strategies. A common policy [7]–[13] is to scale all images by a fixed factor. Thus, these transcoding proxies fail to dynamically address the variation in the resource requirements of different Web documents. The set of client devices will also grow more diverse. Certain resources, such as effective network bandwidth, costs and patience of the users can be different for similar client devices. The static adaptation policies used by these systems do not handle well this variability in Web content and client resources.

None of the existing transcoding systems (with the possible exception of [11] and [14]) consider the requirements of the entire Web page or relationships between its various components in different media. Also, these systems only consider transcoding within the same modality.

In this paper, we propose a content adaptation framework that ***dynamically*** accounts for resource requirements of the complete Web page and its individual components. It selects from a number of different possible transcoded versions of the content, ones that provide the "best value" within the constraints of a client's resources. This system also considers transcoding between modalities. We provide a theoretical framework in which various content adaptation policies can be formulated and analyzed.

One big benefit of the proxy approach is that it is totally transparent to the content providers; they do not have to change the way they author or serve content. However, there are a number of drawbacks to this approach:

1) content providers have no control over how their content will appear to different clients;
2) there may be legal issues arising from copyright that may preclude or severely limit the transcoding by proxies;
3) HTML tags mainly provide formatting information rather than semantic information;
4) on the fly transcoding is difficult to apply to many media types such as video and audio.

These factors limit both the quality and the amount of customization that proxies can provide.

In this paper we present an alternate solution that extends the Web server deployed by a content provider. In this system, the content author can lay the transcoding policies and control the adaptation process. Also, the content author can edit and replace the transcoded versions of content items generated by the system. This control of the customization overcomes problems of publisher control and copyright issues faced by transcoding proxies [7]–[18]. The content is authored in XML [23], allowing the author to provide more information to the transcoding and customization system than can be deduced from an HTML page. The key benefit of this server-based system is that due to the guidance provided by the author, significantly greater level of customization can be performed than is possible in transcoding proxies. The systems generates transcoded versions of the content items prior to any requests; thus, it can handle media items such as video and audio which are difficult to handle in proxies. This off-line transcoding also leads to lower response latencies than proxies. The server shares the benefit of transcoding proxies in speeding content delivery as the customized content is often much smaller than the original content.

B. Outline

We first present the overall architecture of the system. The InfoPyramid, a multimodal, multiresolution representation hierarchy for multimedia, content analysis, transcoding modules, content customization, and cache, is described in Section II.

In Sections III–V, we describe the customization process in detail. In Section VI, we present an implementation of the content adaptation system. We present a summary in Section VII.

II. System Architecture

The content adaptation system is an extension to a Web (http) server. An overview of the system architecture is shown in Fig. 1. The content source contains the multimedia content to be delivered by the Web server. First, content is analyzed to extract meta-data used in guiding subsequent transcoding and selection processes. Based on the capabilities of the typical client devices, different transcoding modules

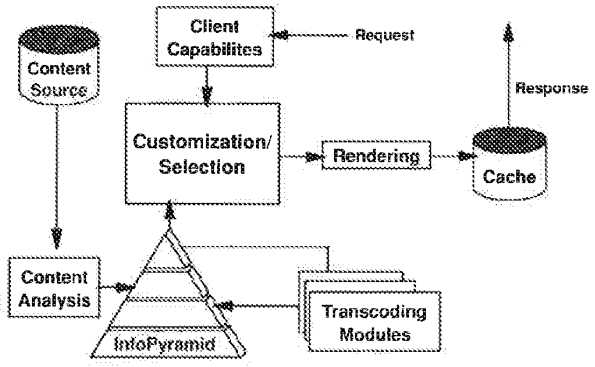


Fig. 1. Internet content adaptation system architecture.

are employed to generate versions of the content in different resolutions and modalities. A novel data representation, the InfoPyramid, is used to store the multiple resolutions and modalities of the transcoded content, along with any associated meta-data. This transcoding is done off-line, during content creation time. When the Web server receives a request, it first determines the capabilities of the requesting client device. A customization module then dynamically selects from the InfoPyramids, the resolutions or modalities that best meet the client capabilities. This selected content is then rendered in a suitable delivery format (for example, HTML) for delivery to the client. A cache that stores these client specific versions of content is used to improve response times. In the following sections, we describe these processes in detail.

A. Client Devices

The types of devices that can access the Internet are rapidly expanding beyond the workstation on LAN that most multimedia Internet content is authored for [1], [2], and [7]. One can now use personal digital assistants (PDA) such as the PalmPilot™ and Sharp Zaurus™, handheld personal computers (HPC) such as the Psion and numerous Windows-CE™ machines, various Internet capable phones such as the AT&T Smartphone™ (cellular) and Screenphone (wired), set-top boxes such as WebTV™ etc. to browse the Web. Even traditional computers such as workstations, laptops and PC may vary widely in their display and specially in their network bandwidth. The browsers designed to meet the special needs of handicapped people can be modeled as client devices with specific capabilities [19]. For example, a speech browser for the blind may be modeled as a device that only supports audio. Thus, we see that to fulfill the promise of universal access to the Internet, devices with very diverse capabilities need to be catered to.

Currently, the system considers the following client device characteristics.

1) *Screen* size i.e., width and height in pixels, color and bits/pixel.
2) Effective *Network bandwidth*.
3) *Payload* defined as the total amounts of bits that can be delivered to the client for the static parts of a Web document. For streaming media this includes only the initial buffer space required before the media starts playing, not the size of the media itself. The payload is defined as the product of the network bandwidth and the time the client is ready to wait (bandwidth* wait-time) before the complete Web page downloads. For storage constrained devices, the payload will be defined as the storage space.
4) *Capabilities* for displaying video/audio/image.

B. Content

We will restrict our discussion to Web pages. The content is authored in XML [21], which is converted to HTML prior to delivery. We are also working on an extension to HTML that allows authors to introduce more information for content customization using XML and also enables our content adaptation system to be deployed at proxies.

A multimedia Web ***document*** W is composed of a number of component ***items*** $A, W = \{A_i\}, i = 1, n$. Each item can be an atomic unit of media, such as an image or a video clip. An item can also be composed of other items, for example a document can have a number of stories as content items, and each story item may be composed of image items, text items, etc. For simplicity, we will first consider only atomic content items, and then, in Section V-B, deal with composite items.

C. Content Analysis

The authored content is analyzed to extract information that will be useful in transcoding and customization. Two types of content analysis are performed.

Each atomic item A of the document is analyzed to determine its resource requirements. The types of resources considered are those that may differentiate different client devices. We determine the following resource requirements.

1) Static content size in bits.
2) Display size such as height, width and area.
3) Streaming bit-rate.
4) Color requirements.
5) Compression formats.
6) Hardware requirements, such as display for images, support for audio and video.

The semantics of the content items are determined in the context of the entire document. We currently analyze images to determine their type and purpose [22], [23]. This analysis allows us to improve image transcoding by selecting policies according to image type and purpose [22].

D. InfoPyramid

The InfoPyramid [25] is a framework for aggregating the individual components of multimedia content with content-descriptions, and methods and rules for handling the content and content descriptions [24]. The InfoPyramid describes content in different modalities, at different resolutions and at multiple abstractions. In addition, it defines methods for manipulating, translating, transcoding, and generating the content. We use InfoPyramids to represent content at multiple

modalities and resolutions so that it can be rendered on a variety of devices. Fig. 1 shows a simplified InfoPyramid for a video.

Multimodal: Multimedia content is usually not in a single media format, or modality. A video clip can contain raw data from video, audio in two or more languages, and closed captions. In the medical arena, MRI, CT, PET, and ultrasound can be captured for the same patient, resulting in multiple three-dimensional (3-D) scans of the same content.

For certain devices, the appropriate content modality may not be available. The required modality may be generated by transforming other modalities. For example, a video clip can be transformed into images showing keyframes [36], while text can be synthesized into speech.

Multiresolution: Each content component can also be described at multiple resolutions. Numerous resolution reduction techniques exist for image and video. Features and semantics at different resolutions can be obtained from raw data or transformed data at different resolutions, thus resulting in a feature or semantic pyramid.

Multiple-Abstraction Levels: The abstraction levels describe features and data in a hierarchical fashion. For example, one hierarchy could be features, semantics and object descriptions, and annotations and meta-data. For content adaption, we store meta-data such as size, color, bandwidth requirements, publisher preferences, etc., for each constituent element. This meta-data may be supplied by content analysis (Section II-C) and/or by the content author.

Methods and Rules: Methods generate content descriptors from the features of the data, or analyze, manipulate, provide modality translation, or process the data in various ways. In addition, the InfoPyramid may have rules to provide flexible application of the methods. Methods and rules provide linkage between different modalities, resolutions and abstractions. For content adaptation, we consider procedures and rules for translating and summarizing (transcoding) between modalities and resolutions.

The InfoPyramid concept can be further generalized by using other axes such as fault/loss tolerance, numerical complexity, interaction modality, etc. Rather than forcing a strong separation between the data and the content description meta-data, the InfoPyramid offers a continuum between the data, various abstractions of the data, and content description data.

Definitions: From each *original* item A_i, in the Web document $W = \{A_i\}$, an ***InfoPyramid*** $M_i = \{M_{ij}\}, j = 0, m_i$, is computed by transcoding A_i into j ***versions*** with different resolutions and modalities.[1] We will denote the original version by $M_{i0} = A_i$. We also introduce a null version, which corresponds to the item being deleted from the delivered content, by $M_{im_i} = \phi$.

E. Transcoding

Content transcoders populate the InfoPyramid structure with multiresolution, multimodal versions of the content. For example, in Fig. 2, the video is transformed to images by extracting a set of key frames [36]. Audio is also extracted from the video. Each of the modalities is then represented at different resolutions, bit-rates, color depth, etc. We have implemented a number of transcoding modules for handling video and images and imported others for text, images, video and audio. The system is designed to allow third-party content transcoders to be plugged in. The capabilities of the typical client devices and content analysis are used to guide the transcoding process. The transcoding is done off-line, unlike in previous proxy-based systems [7]–[18].

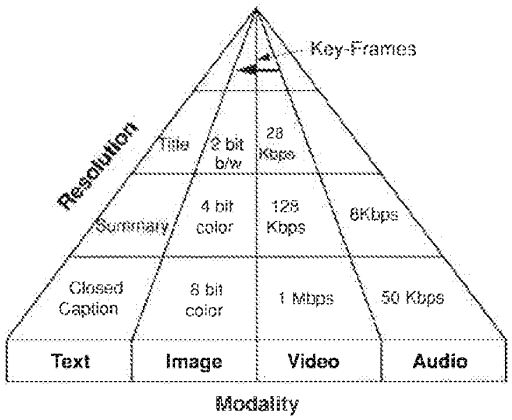


Fig. 2. An InfoPyramid for a video item.

F. Customization

The customization module uses the client device characteristics as constraints to pick the best content representation. The best representation is the one that maximizes content value for that client device. This customization process is detailed in Sections III–V.

The InfoPyramids represent the transcoded resolutions and modalities of the component multimedia items. From the InfoPyramids, the customization module selects the final ensemble such that it optimally satisfies all the client's resource constraints. This content selection is performed dynamically in response to a request. Thus, the customization is able to account for any time varying client resources such as effective bandwidth and storage.

The customization utilizes a value-resource framework, which is generalization of rate-distortion (Section III). We then solve the problem of generating a version of a Web document that provides the most "value" to a client within the client's resource constraints. In Section IV, we model the selection problem as one of optimal allocation of the resources on the client among the different versions of the multimedia items of the Web document. We show that different models for the relationship between the value and the resource requirements lead to different optimal resource allocation strategies. In Section V, we present extensions to the optimization process to 1) account for the importance of each item and 2) to jointly satisfy different class of resources, such as display area and bandwidth.

[1] In the following discussion, we will often use "*item i*" as a shorthand for "*InfoPyramid of the item i*."

G. Cache

When a customized Web page is delivered to the client, it is also stored in a cache. When the system receives a request for a document, it first checks if a client with the same capabilities made the request previously, and if so, retrieves the corresponding customized. Temporal variations in resources on the client, such as bandwidth, CPU resources, storage, etc., will reduce the cache hit ratio. To effectively handle this, the cost of performing customization versus the variation in the resources will need to be considered. Our system currently performs customization again if the resources for the requesting client differ from the cached versions. Alternatively, one can group clients with very similar capabilities under the same client id. We will also explore the possibility of storing partial InfoPyramids based on customizations performed for clients, and using these to for subsequent customizations, thus reducing the search space for the customization.

III. Content Value

Image or video compression can be viewed as adapting the content to meet bit resource constraints. One framework for compressing to meet bit resource constraints [26], [28] has built on the rate-distortion (R-D) theory due to Shannon [27]. Rate-distortion theory deals with the minimum bit-rate R needed to represent a source with desired distortion D, or alternately, given a bit-rate R determining the distortion D in the compressed version of the source. The rate-distortion framework is employed in many image and video compression systems, for example [26], [28]–[30], [33]. We generalize rate-distortion theory to a ***value-resource*** framework by considering different versions of a content item in an InfoPyramid as analogous to different compressions, and different client resources as analogous to the bit-rate.

Distortion is typically measured as the mean squared error (MSE) between the source and its compressed version. One problem with the MSE based distortion measure is that it may not correspond to the perceived loss of fidelity [31]. However, a bigger drawback is the difficulty of formulating a meaningful distortion measure when the adaptation is drastic. For example, it is difficult to measure the loss of fidelity when a video is transcoded to a set of key frames or transcoded into its textual transcript.

To overcome this problem, we introduce a subjective measure of fidelity which we call ***value***.

Definition: Value

$$V(M_{ij}) = \frac{\text{perceived value of transcoded version } M_{ij}}{\text{perceived value of original } M_{i0}}.$$

$$V \in [0,1], \quad V = \begin{cases} 1 & \text{for original item } M_{i0} \\ 0 & \text{when the item is excluded } M_{im_i}. \end{cases}$$

The benefit of V is that we have a measure for fidelity that is applicable to transcodings of media at multiple resolutions and multiple modalities. This also allows us to compare document items that were in different media types. However, the drawback is that we still do not have a computational mechanism for determining V. The value V can either be assigned by the author for each transcoding, or we can assume some arbitrary functional relation between V and R, the resource utilized. In the special case where we can measure the distortion D of all the versions, and the distortion for the null version is assumed to be infinite, we have $V = (1/1+D)$.

The value/distortion is neither an easily estimated metric, nor is it uniform across different people with diverse interests. In general, it will also be difficult to manually assign values to different transcodings. The content value is a useful construct that helps us analyze various dynamic content adaptation policies in a theoretical rate-distortion based framework and draw parallels with compression.

IV. Resource Allocation

We can then model the content adaptation as the following resource allocation problem:

$$\max \left\{ \sum_i V_i \right\} \text{ such that } \sum_i R_i \leq R_{\text{client}} \qquad (1)$$

where $V_i \in \{V(M_{ij})\}$ and $R_i \in \{R(M_{ij})\}$ are the values and resources used by the ith item M_i of the multimedia document. While V_i and R_i are discrete, we will first consider them to be continuous, and then deal with the discrete case. R_{client} is the maximum resource available at the client.

Let the value V_i be some function of the resource, R_i, i.e. $V_i = f_i(R_i)$. We convert the above *constrained optimization* problem to an *unconstrained* optimization problem by considering the Lagrangian [32]:

$$L(R,\lambda) = \left\{ \sum_i V_i + \lambda \left(R_{\text{client}} - \sum_i R_i \right) \right\} \text{ with } \lambda \geq 0.$$

Then if R_0 is an optimal solution, there exists a λ_0 such that $\Delta L(R,\lambda) = 0$. Given that the items, and thus their values, are independent of each other, we get $(\partial L/\partial R_i) = (df_i(R_i)/dR_i) - \lambda$. Therefore, the candidate solutions to (1) are given by

$$\frac{df_1(R_1)}{dR_1} = \frac{df_2(R_2)}{dR_2} = \cdots = \frac{df_i(R_i)}{dR_i} = \cdots = \lambda. \qquad (2)$$

A. Analytic Functions

Content value, as an alternative to distortion, makes it possible for authors or users to specify value judgements about various transcoded versions of the content. However, manually assigning the values is not a practical proposition in most scenarios. To mitigate this problem, we introduced functional mappings between content value and resource utilization. This is not to suggest that there actually exist such a simple mechanism for assigning value (or distortion). Computing distortion, even in specific modalities such as images, that is meaningful perceptually over all images and people is not easy [31]. Our framework allows one to design fast adaptation policies for a combinatorial resource allocation problem, by assuming a particular functional mapping that captures the general trend of reduction in value with resource utilization. Fig. 3 shows a table for example values obtained

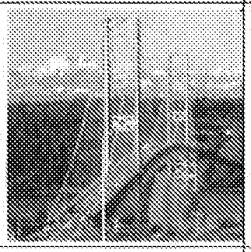
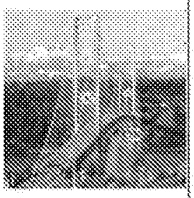
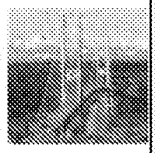
	Workstation/LAN	PC/Dialup	TV Browser	Gray PDA	BW PDA	Text Browser
Image						"bridge"
Color	24 bit color	24 bit color	256 colors	4 bit gray	B/W	
Size	256x256	192x192	128x128	96x96	64x64	
Bits	34KB	23KB	8KB	4KB	0.6KB	0.01KB
Value = RUF*Bytes	1.0	0.68	0.24	0.12	0.02	0.0003
Value = RUF* ln(Bytes)	1.0	0.96	0.86	0.79	0.61	0.22
Value = RUF* Sqrt(Bytes)	1.0	0.84	0.48	0.34	0.13	0.017

Fig. 3. Table showing value V for different functional relationships between value and resource used in terms of bytes.

using different functional relationships with the resource in bits (payload).

Let us assume a function $f, V_i = f_i(R_i)$. Note that f, and therefore, the solution, is dependent on the choice of units for R. If f is concave, (2) will give us the optimal solution. We will first consider the case when f is not concave and then the case when it is.

Nonconcave: We will limit our discussion to the case when f is either linear or convex. Let us assume that the value of an item is linearly proportional to the resource that it utilizes i.e. $V_i = c_i R_i$. From the definition of V, we have that $f_i(R_i) = 0$ when item i is absent from the delivered document i.e. $R_i = 0$ and $f_i(R_i) = 1$ for the original version of item i i.e. $R_i = R_i^{\max}$. Thus, $c_i = (1/R_i^{\max})$. We term c_i to be the *resource utilization factor* (RUF) because it measures how well the item i utilizes its resources to deliver value. It is easy to see that a greedy algorithm that allocates resources to items in the order of their RUF's gives the optimal resource allocation:

1) store items in order of decreasing RUF, c.
2) starting with the item with the largest RUF, allocate the maximum resources that each item can use until all the resources are depleted.

Similarly, the optimal resource allocation for any convex function f is also the greedy algorithm.

Concave: Let us consider the concave function $V_i = c_i \ln(1 + R_i)$. We have defined f on $1 + R_i$ to avoid negative V_i. For simplicity, we assume that $R \gg 1$ for most versions, and that $R = 1$ is equivalent to the item being deleted, giving $V_i = c_i \ln(R_i) = (\ln(R_i)/\ln(R_i^{\max}))$. We now get a RUF of $c_i = (1/\ln(R_i^{\max}))$. Using (2), we see that the resources are distributed among the items in proportion to their RUF's. Since, $V_i = c_i \ln(R_i)$ is concave (and the constraint is linear), this solution is optimal. In a similar vein, (2) will give us the optimal solution for all other concave functions.

Discrete Values: Since each item is transcoded into a limited number of versions, we may have no version that uses exactly the same resource as computed in the optimization process above. To account for the discrete values, we use the following algorithm.

1) For each item i, let R_i' be the resource selected by the optimization process. Select version j such that $R_{ij} < R_i'$ and $R_i' - R_{ij}$ is minimum.
2) Order the items in order of decreasing RUF's. Starting from the item with the highest RUF, while there are any resources left, assign to each item the version with the next higher value.

Step 2 needs to be performed only once.

B. Arbitrary Functions

When the values V_i are assigned, say by the author, we adapt a technique by Shoham and Gersho [33]. For each InfoPyramid M_i of each item i, we plot the value V_{ij} versus the resource utilized R_{ij} of each version M_{ij}, as illustrated in Fig. 4. The optimal version M_i' is given by sweeping a line with slope λ, from the top-left to the bottom-right, until it meets the concave hull of these points. As shown by (2), and in [33], the optimal solution is given by the same slope λ for all the different items i. As in [33], we perform a binary search for λ such that $\Sigma_i R_i$ is close to, but less than R_{client}. Points outside the concave hull are not in the solution space. For example, a text transcript of video may take more screen space but have less value, so it is out of the solution space. Note that if V is denoted in terms of D, as in (2), this resource allocation strategy becomes equivalent to the one presented in [33].

V. Extensions

Next we consider the extensions of the resource allocation strategies discussed in the previous section to account for

1) priorities on content items;
2) hierarchical or composite items;
3) multiple classes of resources;
4) mutually dependent items.

A. Priorities

In the resource allocation strategies discussed in Section IV, no matter how the value to resource relationship is defined, the items with the least resource requirements for their original versions (i.e., with the highest RUF) get precedence in the allocation of resources. Thus, when considering the bandwidth or computational resources, text items will always be assigned resources ahead of image items, and smaller images will get precedence in resource allocation over larger images.

The author of the Web document may have a mental priority ordering of the items in the document that is different from that given by their RUF's. Consider, for example, a news Web page that has one color photograph of the event covered in the news story. The page also has a large number of small images used for decorative purposes. When the news story is adapted for a client with low bandwidth or small screen size, all the resources may get allocated to the decorative images and the image central to the story may not get delivered.

Thus, we need to extend our content adaptation model to account for priorities on the content items of a document. The priorities may be assigned by the author of the page, as is the case above. Many Internet applications, such as search engines, customized news sites, etc., generate documents dynamically in response to a user request. In these applications, there is often a priority implicitly assigned to the items. For example, in image search engines, the match scores of the returned images serve as priorities. When the result page consisting of the matched images is returned to a client with low bandwidth or screen area, the images should be reduced or removed on the basis of their match scores an not their sizes (in terms of area or bits).

Let P_i be the priority assigned to item i by the author or the application. We then define the *prioritized value* of item i as $V_i^P = P_i V_i$. The goal is now to find $\max_i\{\Sigma_i V_i^P\}$ such that $\Sigma_i R_i \leq R_{\text{client}}$.

Using this formulation, the following resource allocation strategies mirror those described previously in Section IV, but with prioritized values replacing RUF's.

1) If f is linear or convex, the resources are assigned in a greedy manner in order of the prioritized values of the items.
2) If f is logarithmic, the resources are assigned in proportion to the prioritized values of the items. In general, when f is concave, we can apply the technique outlined in Section IV-A.

When f_i is not analytic, the value versus resource plot (Fig. 4) is replaced with $V_i^P = P_i V_i$ on the Y-axis. The rest of the algorithm is as described previously in Section IV-B.

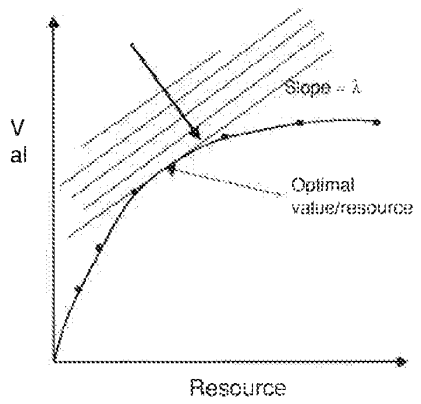


Fig. 4. Optimal value is obtained at the point where a line with slope λ meets the concave hull. The version selected has value closest to this optimal.

One common transcoding practice [7]–[13] is to scale the size of all images by a constant factor (0.75, 0.25, etc.). One can argue that in the original Web document, the larger images were more important as more resources were given to them. We can model these intrinsic priorities as proportional to ln(image size). Then this *ad-hoc* policy of constant scaling is equivalent to allocating the client resource of screen area in proportion to the prioritized values of the images and is optimal with the assumption that image value is a logarithmic function of its size.

B. Composite Items

Each content item i can be a *composite item*, i.e., a hierarchy of other content items. To account for composite items, we allocate resources using $V_i = f_i(R_i)$ where f is a concave analytic function and the items i under consideration may be composite. The optimal resource R_i^* thus allocated to each composite item i is in turn used as the resource constraint for its constituent items. We then allocate this resource R_i^* among the children of the composite item i. This resource allocation is repeated until the items being considered are atomic. When we have priorities assigned to items, we similarly modify the resource allocation strategy described in Section V-A.

For a composite item, the number of its different versions is combinatorial in the number of its children item. Thus, it is not practical to manually assign values to each version of a composite item.

C. Multiple Resources

A client may have a different number of *capabilities* and *resources*. We term capability to be the ability to handle a particular media type. For example, a hand-held PC (HPC) may not be capable of displaying video, and a PDA may not be capable of displaying color images. Before we start the resource allocation process, we remove from consideration all the versions of items that a client is not capable of handling.

The resources of a client can typically be divided up among several items. Examples of resources are

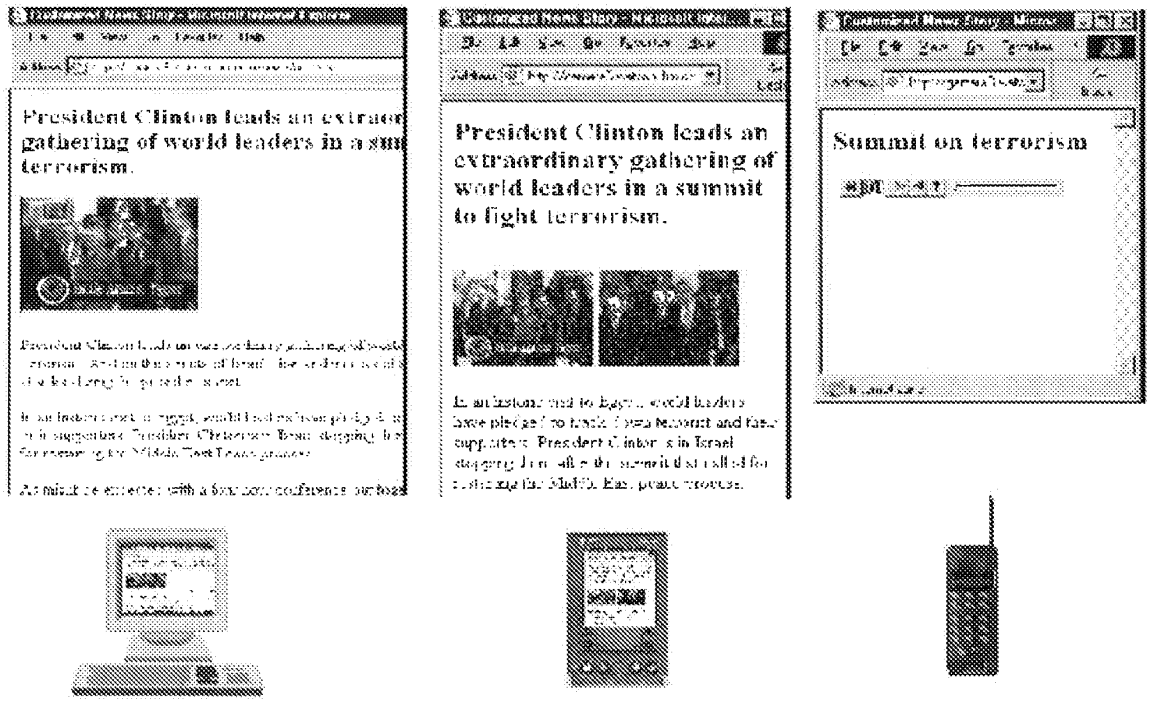


Fig. 5. The workstation gets the full text of the story and streaming video. The PDA gets a text summary and two keyframes in 2-bit grayscale. The cellular phone gets a short title and audio.

1) bandwidth;
2) bits as determined by the product of the bandwidth and the time a client is ready to wait to receive the complete document;
3) bits determined by the clients storage capacity;
4) screen area;
5) money the client is ready to pay for the document, etc.

Let there be r different resources R^k_{client} that we have to consider. Then, the resource allocation problem can be stated as $\max_i\{\Sigma_i V_i\}$ such that $\Sigma_i R^k_i \leq R^k_{\text{client}}$ for all $1 \leq k \leq r$.

We first allocate each resource R^k_{client} separately. Let M^k_i be the version of item M_i that is selected for resource k. We can select only one version of an item to be delivered. We achieve this by the following algorithm.

1) For each item i, find the set of resources $R_i = \{R^k(M^k_i)\}$ used by each of its versions selected for each of the resources.
2) For each item i, find the version M_{ij} that has the highest assigned value among all the versions and such that for all $k, R^k(M_{ij}) \leq R^k(M^k_i) \in R_i$. If no values have been assigned, since we define $V_i = f^k_i(R^k_i)$, the value of a version may be different for different resources. In that case, we choose a resource as the dominant resource, and use the values of the versions for that resource.

The above algorithm is guaranteed to select one version for each item without breaking the constraints of any of the r resources. However, the version so selected may not be optimal. To find the optimal set, a search (possibly combinatorial) may be required.

D. Mutual Dependence

For finding the optimal content adaptation schemes we assumed that the content items on a Web page are independent of each other. This assumption may not hold in general. For example, for a news story, if the text to the story has to be discarded due to space limitations, then delivering the pictures for the story may not be very useful. Our partial solution is to use composite items (Section V-B). We consider dependent items as composite items and allocate resources first to the composite item. This resource can then be allocated among the components of the composite item in an all-or-none manner. This solution is nonoptimal. A better solution would be to extend rate-distortion techniques for handling dependent blocks, such as [34], [35], and [26], to the value-resource framework.

VI. A Multimedia News System

We have implemented a Web server that customized Web pages to the capabilities of the client requesting them, employing the content adaptation process described above as an extension to this server [19].

For content, TV news programs are captured and parsed into stories [36]. The raw content for each news story is the video and the closed captioned text. Currently, we manually add a title to each new story. The content items are the title, the video, and the text of the news story. Based on a template InfoPyramid for news stories, these raw content items are ingested into InfoPyramids. The content is then transcoded to populate the InfoPyramids. The video content is compressed at multiple bit rates (1.14 Mbs, 128 kbs, 56

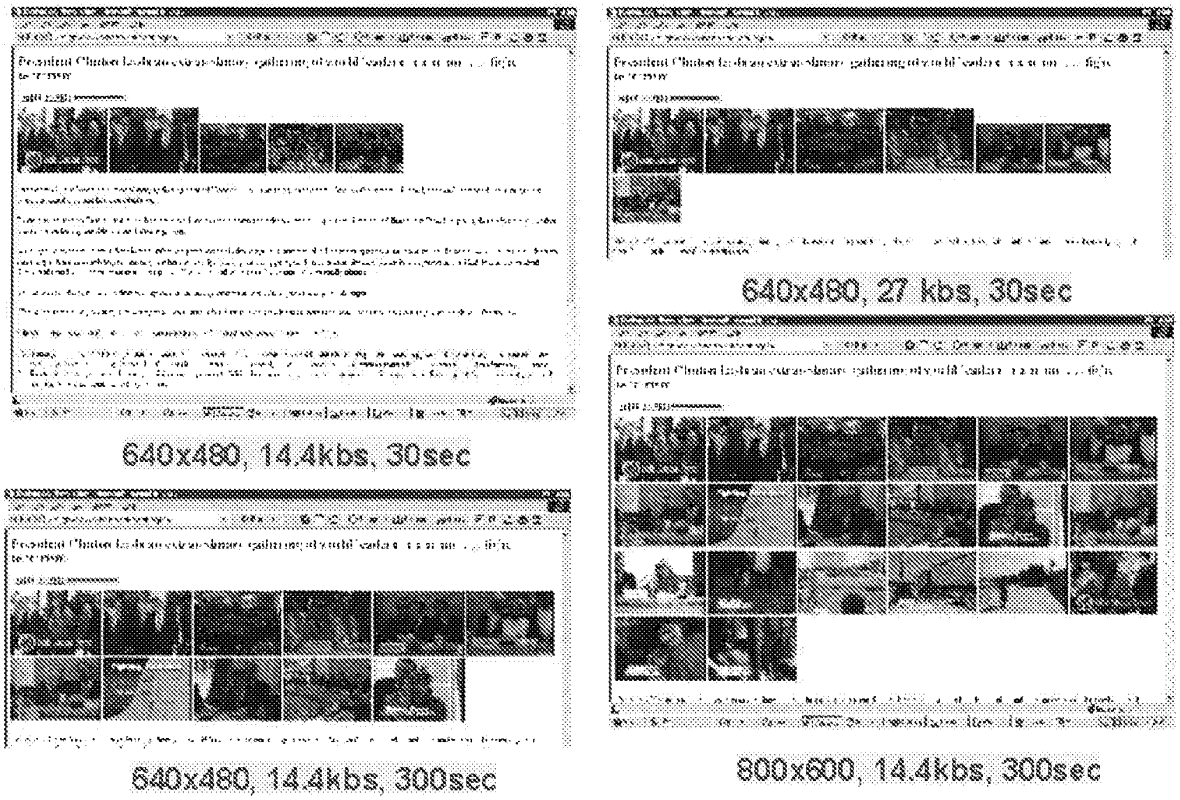


Fig. 6. Dynamic adaptation of same original content to different resources on client. Client resources are specified as *screen width* × *screen height*, *bandwidth*, and *wait-time*.

kbs, 28 kbs). The audio is extracted from the video and also compressed at multiple bit rates (50 kbs, 8 kbs). The video modality is also converted to images by extracting keyframes. These images are then converted for multiple color depths and resolutions (original size JPEG, 0.75 scale as 16-color GIF, 0.75 scale as gray-level GIF). The textual elements of the story are converted into summary versions. These InfoPyramids are then represented in XML (details on the XML DTD for the InfoPyramid can be found in [25]).

This multimodal, multiresolution version of the multimedia news story has many possible renditions. In our example, we have stories with over 2^{60} different possible renditions. We assigned the same default priorities for the title, video and text InfoPyramids for all the news stories. We also manually added priorities to key-frames based on our subjective judgement of their importance. Since the stories have an average of over a dozen key-frames, this allowed us to test out the effect of adaptation for both small and large differences among client resources.

Currently, the system considers client device resources of screen size, color depth, network bandwidth, maximum download time, and capabilities regarding video/audio/image display and screen color.

The web server dynamically synthesizes a rendition of the news story by selecting and combining the components of each constituent InfoPyramid such that the result both meets the client capability constraints and maximizes the content value for a given set of client resources. Fig. 5 shows example delivery of same story to a workstation on a LAN, a PDA on a CDPD modem, and a smart cellular phone using the priority-based greedy resource allocation strategy described in Section V-A. Some of the content adaptation is based on client device capabilities and some on resource allocation. For example, for the PalmPilotTM, video, audio and color image versions were filtered out prior to the resource allocation. The allocation of screen size and payload resources resulted in a summary of the text being selected and two images with the highest priorities being selected out of the 30 images.

Fig. 6 shows results of adaptation for client devices with the same capabilities but varying resources. The differences in the content delivered to these clients are only due to the resource allocation. In Fig. 6(a), a PC with VGA screen on a 14.4 kb modem gets the title and text of news story along with an audio stream and some images. We can see that images with lower priorities get fewer resources by the fact that some of them are shown at a reduced scale and color depth. If we increase the bandwidth to 27 kbs (at 28 kbs, we would select video instead of audio+keyframes), we see that some of the images from Fig. 6(a) get more resources, and some lower priority images are added. If we increase the wait-time to 300 s, increasing the total number of bits available at the client, we see that in Fig. 6(c) there are more images that get downloaded. In

Fig. 6(d), the client has the same bandwidth and wait time as in Fig. 6(c), but a larger-screen. As this client get more images delivered, we can see that the client in Fig. 6(c) was running out of screen-space before it was running out of bits.

VII. Summary

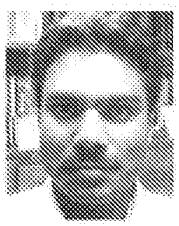
In this paper, we have presented a system for adapting multimedia Internet content. This system adapts Web content to client devices with diverse capabilities. Thus, this system enables *universal access* to the Internet by allowing different types of devices, and people with different abilities, to receive content adapted to a form suitable for them. We used InfoPyramids to represent content transcoded into multiple resolution and modalities. We extended the rate-distortion framework to optimally allocate resources on the client among the different content versions in the InfoPyramid. Finally, we presented an implementation of the content adaptation scheme.

In the value-resource framework, content adaptation is analogous to compressing multimedia documents to meet resource constraints imposed by the client device. However, unlike traditional compression, a composite document is considered and the constraints are not limited to bits or bandwidth, but also include resources such as screen size, color, cost, and hardware and software capabilities. Further, our framework can be used to analyze various content adaptation strategies, for example, the common practice of scaling images [7]–[13] by a constant factor, the greedy policy and the proportional policy. This value-resource framework also clearly shows that it is critical to assign priorities to content items in a multimedia document to get useful content adaptation polices.

The server-based content adaptation approach allows precise control over the process by the publisher. It also allows a higher level of customization, both in terms of the variety of client devices and the variety of media types than is possible by proxy based solutions. We are investigating extensions to HTML that would allow authors to annotate their HTML documents for client based customization and thus allow the deployment of the system, with comparable benefits, on proxies.

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Dr. Smith received the Eliahu I. Jury award from Columbia University for outstanding achievement as a graduate student in the areas of systems communication or signal processing in 1997.



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Dr. Li received a Research Division award from IBM in 1995 for his major contribution to the tunable receiver design for WDMA, and numerous invention and patent application awards. He is serving as the Technical Editor and Feature Editor for the *IEEE Communications Magazine*. He has authored or coauthored more than 100 journal and conference papers and received one of the Best Paper awards from the IEEE International Conference on Computer Design in 1992. He is a senior member of the IEEE Laser Electro-Optic Society, the Communication Society, the Computer Society, and the Circuits and Systems Society.

US007551913B1

(12) **United States Patent**
Chien

(10) **Patent No.: US 7,551,913 B1**
(45) **Date of Patent: Jun. 23, 2009**

(54) **METHODS AND APPARATUS FOR ANONYMOUS USER IDENTIFICATION AND CONTENT PERSONALIZATION IN WIRELESS COMMUNICATION**

(75) Inventor: **Herman Chien**, Redmond, WA (US)

(73) Assignee: **AT&T Mobility II LLC**, Atlanta, GA (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 609 days.

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(22) Filed: **Dec. 5, 2001**

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H04L 9/32 (2006.01)
H04K 1/00 (2006.01)

(52) **U.S. Cl.** **455/411**; 380/247; 705/74

(58) **Field of Classification Search** 455/403, 455/73, 411; 379/93.25, 433.09; 705/74; 718/108; 380/247
See application file for complete search history.

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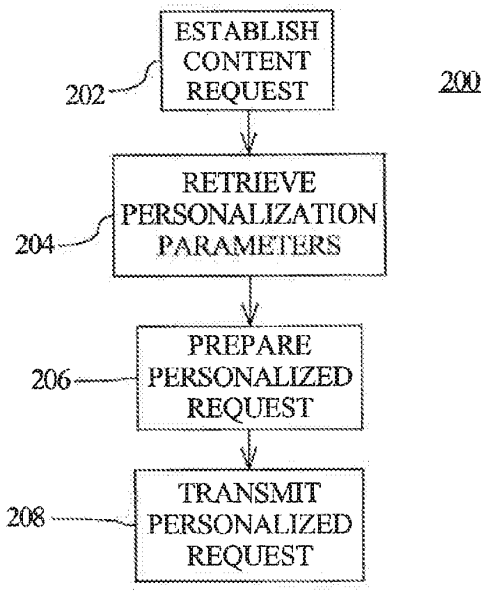
* cited by examiner

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(57) **ABSTRACT**

Methods and apparatus for providing personalized content to a user of a wireless network include establishing an anonymous user identifier and delivering the user identifier to a content provider. Based on the user identifier, communication with a predetermined data source is established or predetermined data content is selected. In some embodiments, a device identifier is provided in addition to the user identifier and device specific, personalized content is delivered to the user. In one example, a device identifier and a user identifier are based on a mobile station serial number and a subscriber identity module, respectively, and are used in an HTTP header. The anonymous user identifier can be based on a subscriber identity module (SIM) serial number, or a hash of the SIM serial number so that user information such as a user phone numbers is not available to content providers.

29 Claims, 3 Drawing Sheets



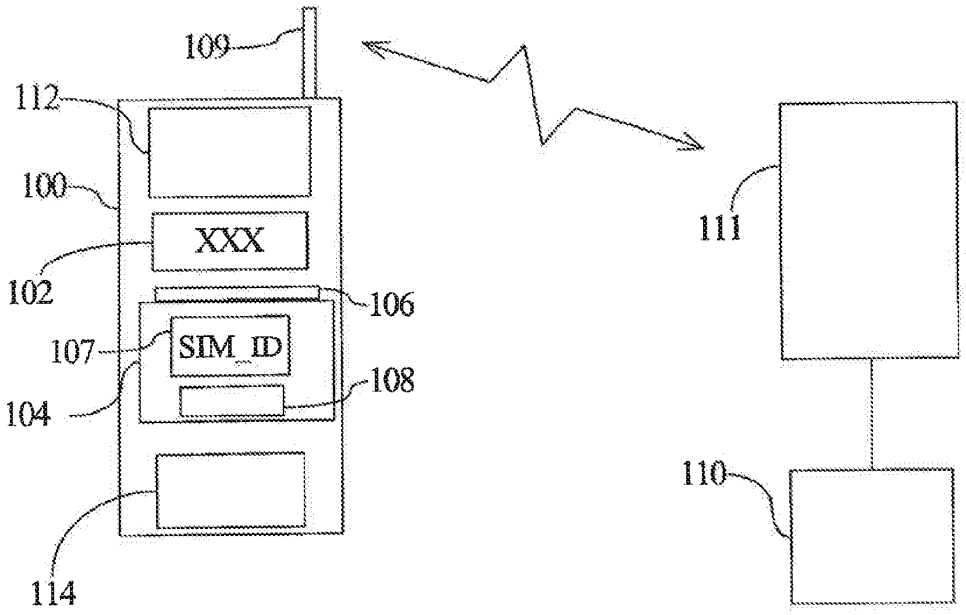

109
112
100
XXX
102
106
107
SIM_ID
108
104
111
110
114

FIG. 1

FIG. 2

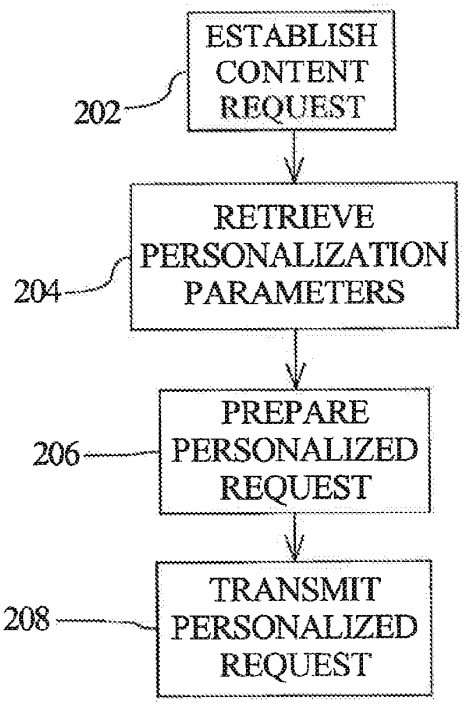
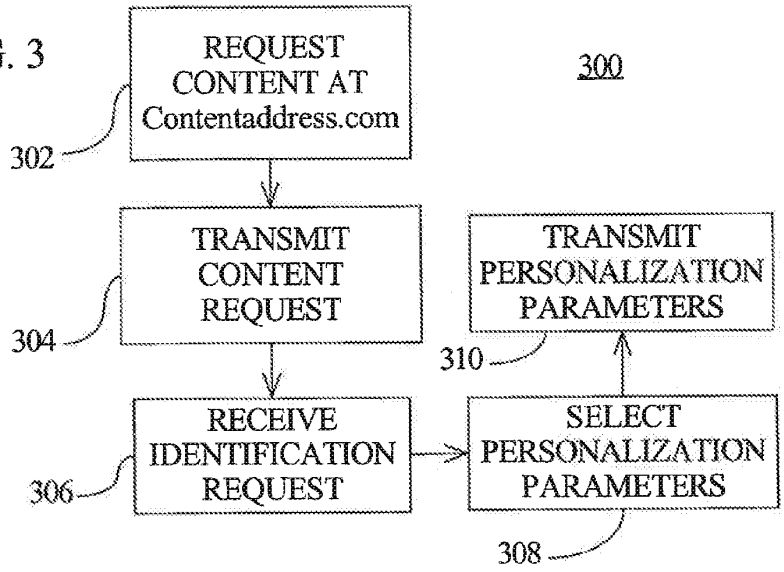

ESTABLISH CONTENT REQUEST
202
200
RETRIEVE PERSONALIZATION PARAMETERS
204
PREPARE PERSONALIZED REQUEST
206
TRANSMIT PERSONALIZED REQUEST
208

FIG. 3


REQUEST CONTENT AT Contentaddress.com
302
300
TRANSMIT CONTENT REQUEST
304
TRANSMIT PERSONALIZATION PARAMETERS
310
RECEIVE IDENTIFICATION REQUEST
306
SELECT PERSONALIZATION PARAMETERS
308

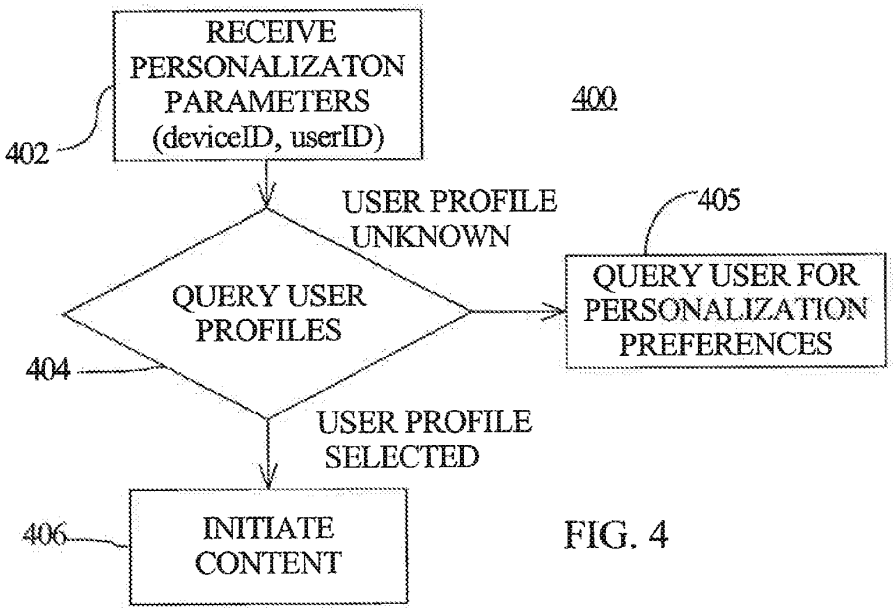

RECEIVE PERSONALIZATON PARAMETERS (deviceID, userID)
402
400
USER PROFILE UNKNOWN
405
QUERY USER PROFILES
404
QUERY USER FOR PERSONALIZATION PREFERENCES
USER PROFILE SELECTED
406
INITIATE CONTENT

FIG. 4

FIG. 5

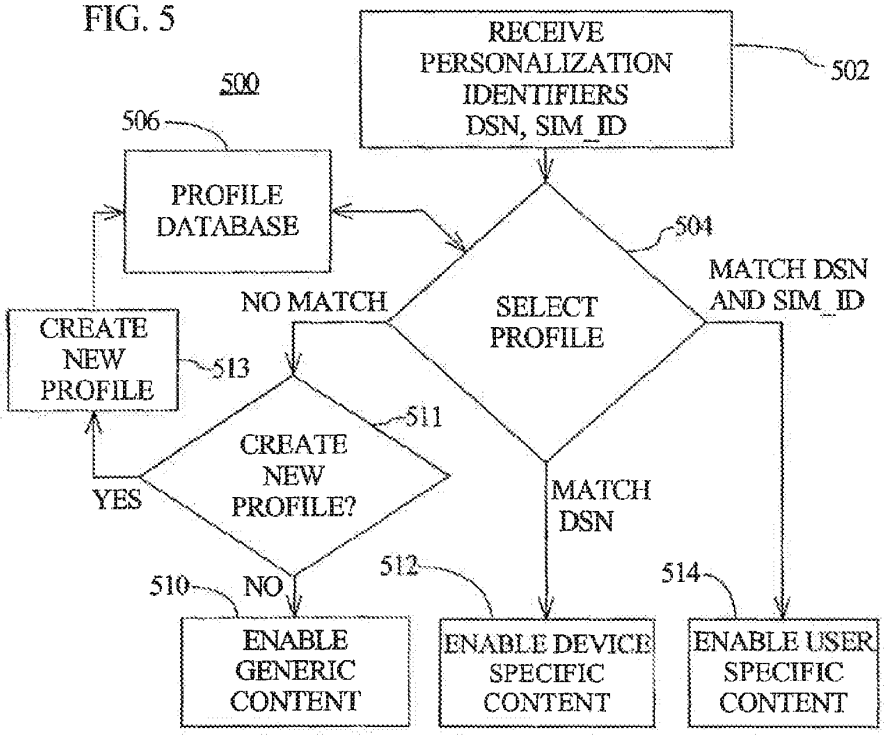
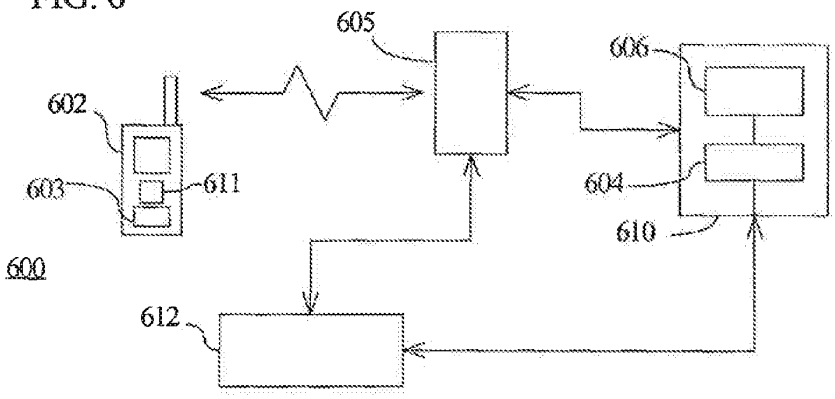

500
RECEIVE PERSONALIZATION IDENTIFIERS DSN, SIM_ID
502
506
PROFILE DATABASE
504
SELECT PROFILE
MATCH DSN AND SIM_ID
NO MATCH
CREATE NEW PROFILE
513
511
CREATE NEW PROFILE?
YES
NO
MATCH DSN
510
512
514
ENABLE GENERIC CONTENT
ENABLE DEVICE SPECIFIC CONTENT
ENABLE USER SPECIFIC CONTENT

FIG. 6


605
606
602
603
611
604
610
600
612

METHODS AND APPARATUS FOR ANONYMOUS USER IDENTIFICATION AND CONTENT PERSONALIZATION IN WIRELESS COMMUNICATION

FIELD OF THE INVENTION

The invention pertains to methods and apparatus for providing user identification in wireless communications.

BACKGROUND AND SUMMARY

Wireless communication systems typically offer limited communication bandwidths and/or data rates. One method of enhancing data communication is to limit total data transfers to and from a user by providing customized data to the user. As a result, system data capacity is available for transfer of selected data, and is not wasted on data inappropriate for, or unwanted by a particular user.

Data customization in wireless communication can be based on a communication device serial number. For example, a cell phone used by a network subscriber to access a wireless network includes a device serial number. While the network can be configured to provide data to this cell phone based on the serial number, such data customization is inadequate for another user of the same cell phone. In addition, a user of multiple shared cell phones can receive data content configured differently based on different cell phones, and not based on user identification. Not only is unwanted data communicated to the user, wasting network capacity so that the network appears slow, inappropriate personal data or user content preferences selected based on a device serial number can be provided to another user. Such inappropriate data can include personal data or other information that the user wishes to remain private. Due to the ease of exchange of cell phones in networks based on standards such as the Global System for Mobile Communication (GSM), association of individual users based on cell phone serial number is inadequate for data customization.

In one example of serial number based interaction, a keyword that requests return of a device serial number is provided in a Web page. If the user responds in a manner which invokes the keyword, a device serial number is appended to a device model number and the combined number is transmitted. Because of the likelihood that a selected cell phone is used by more than a single user, content providers typically restrict the extent of content personalization available based upon device serial numbers.

In view of the shortcomings of content personalization based on device serial numbers, methods, systems, and apparatus are needed for anonymous content personalization.

Communication devices include a register configured to store a user identifier and a transmitter configured to transmit the user identifier to a network. According to representative embodiments, communication devices also include a register configured to store a device identifier, and the transmitter is configured to transmit the device identifier to the network. In additional examples, the communication devices include a processor, and a user input interface is configured to supply commands to the processor. The user identifier is an anonymous identifier that does not enable discovery of sensitive personal information such as a telephone number and can be based on a serial number defined in a subscriber identity module (SIM). In some embodiments, the processor is configured to encrypt at least one of the device identifier and the user identifier before transmission to the communication network. In other embodiments, the user identifier is hashed prior to transmission or prior to delivery to a content provider.

Cell phones include a display configured to display data and commands and a keypad or other user input interface for data entry and command entry. A subscriber identity module (SIM) includes a user identifier and a transmitter is configured to transmit the user identifier. In additional examples, the cell phone includes a memory location configured to store a device identifier, and the transmitter is configured to transmit the device identifier. In a representative example, the user identifier is associated with a SIM serial number.

Subscriber identity modules for a wireless network include a memory configured to retain a SIM identifier and a processor configured to supply the SIM identifier to a communication device. According to representative examples, the processor is configured to provide a hash of the SIM identifier to the communication device.

Content providers include a personalization interface configured to receive personalization data and a processor configured to provide content to a user based on personalization data. According to some examples, content providers include a database configured to store personalization data. In further examples, the personalization interface is configured to receive personalization data associated with an HTTP header. In additional representative examples, the personalization interface is configured to receive personalization data that includes a device identifier and the processor provides device-specific content based on the device identifier. In still other examples, the personalization interface is configured to receive personalization data from a mobile station and receive a user identifier that is stored on a subscriber identification module (SIM). In some examples, the user identifier is a SIM serial number.

Methods of providing personalized content in a wireless communication network include selecting an anonymous user identifier and selecting content based on the user identifier. According to a representative example, the user identifier is selected based on a subscriber identity module. In other examples, methods include selecting a device identifier. In further embodiments, the device identifier and the user identifier are compared with a set of user profiles and content is selected based on a selected user profile.

Methods of obtaining anonymous personalized content include selecting an anonymous user identifier and identifying content for delivery based on the anonymous user identifier. In some examples, the anonymous user identifier is based on a serial number of a subscriber identification module.

These and other features of the invention are described below with reference to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a block diagram illustrating communication between a wireless communication device and a content provider.

FIG. **2** is a block diagram illustrating a method of requesting personalized content.

FIG. **3** is a block diagram illustrating an alternative method of requesting personalized content.

FIG. **4** is a block diagram illustrating a method of configuring a content provider for delivery of personalized content.

FIG. **5** is a block diagram illustrating a method of providing personalized content.

FIG. **6** is a block diagram illustrating a communication system that includes a content provider having a personalization interface.

DETAILED DESCRIPTION

Transmission of content personalization indicators in an unsecured wireless network can present security issues as such indicators can be intercepted, permitting unauthorized users to access sensitive personal information. In addition, users typically wish to remain anonymous and do not intend to reveal user phone numbers or other personal data. Use of a device serial number as a personalization indicator does not generally reduce network security as such numbers can be freely exchanged. However, content personalization based on device serial numbers is limited to customization based on a communication device that may or may not be associated with a particular user.

With reference to FIG. **1**, a wireless communication device **100** such as a cell phone, handheld computer, or other device is provided with a device serial number **102** and a subscriber identity module (SIM card) **104** that is retained by a SIM connection **106**. The SIM card **104** includes a microprocessor/memory system **108** configured to store subscriber identifiers and in some examples, can be configured to encrypt voice and/or data communications, or provide cryptographic parameters for such encryption. The communication device **100** includes an antenna **109** configured to transmit one or more subscriber identifiers to a content provider **110** via a wireless or other communication network **111**. The communication device **100** is also configured to exchange voice and data transmissions with the network **111**. As shown schematically in FIG. **1**, the SIM card **104** is configured to fit within the communication device **100**, and is generally configured to be removable for use in additional communication devices. For example, a single SIM card **104** can be used with a variety of communication devices of a single user, such as one or more cell phones or handheld computers. The communication device **100** also includes a display **112** and a keypad **114** or other input device for input of alphanumerical values, retrieval of commands and data stored in on-board memory, and transmission of commands to the network **111** and the content provider **110**.

The network **111** can be configured to provide data service based on, for example, the General Packet Radio Service (GPRS) and/or the Global System for Mobile Communication (GSM) digital cellular service. In wireless systems based on the Global System for Mobile Communication (GSM), the SIM card **104** is configured to provide an international mobile subscriber identity (IMSI) to the wireless network. The IMSI typically includes a unique subscriber identifier including, for example, a home country and carrier. The SIM card **104** is also configured to provide a mobile station ISDN number (MSISDN). Generally communication of the MSISDN to a content provider is undesirable because the MSISDN contains the subscriber phone number and users generally wish to remain anonymous.

In addition to the microprocessor/memory system **108**, the SIM card **104** also includes a SIM_ID **107** that is typically provided at least in part by the SIM card manufacturer and is based on, for example, date and time of manufacture, manufacturer batch number, or other identifiers supplied by the manufacturer. The SIM_ID (or SIM ICCID) typically includes static digits that indicate application, mobile country code, and mobile network code. In addition, the SIM_ID includes variable digits associated with SIM vendor, network profile, a sequential number, and a checksum value for assessing SIM_ID integrity. Because portions of the SIM_ID can be obtained by trial and error, the SIM_ID can be hashed so that recovery of subscriber or other information is more difficult.

The communication device **100** can be configured to transmit the SIM_ID to the network **111** and/or the content provider **110**. Because the SIM_ID is established by the manufacturer and is not associated with security-sensitive user identification parameters such as the user's MSISDN and IMSI, communication of the SIM_ID generally presents fewer privacy and security concerns. For enhanced security and anonymity, the SIM_ID can be processed by, for example, the processor **108** or other processor before transmission. For example, the SIM_ID can be processed with a hash function to produce a hash value that is associated with a particular user. Recovery of the SIM_ID from the hash value is difficult, and transmission of the hash value instead of the SIM_ID enhances security.

In the example of FIG. **1**, a SIM_ID serves as a user identifier and a device serial number serves as a device identifier, but other user identifiers and device identifiers can be used. For example, the MSISDN can be used, and, to enhance privacy, can be hashed before delivery to a content provider. Delivery of a hashed MSISDN to a content provider typically would not be sufficient to permit the content provider to determine the user's phone number or to obtain other information necessary to contact the user. An MSISDN can be hashed based upon additional private data provided by a wireless network, so that the hashed MSISDN can be provided without loss of anonymity and can be confidently associated with a particular user. Cryptographic keys or other security parameters associated with a SIM can be used. For enhanced security and privacy, such parameters can be hashed. An international mobile station equipment identity (IMEI) can be used as a device identifier. Other identifiers can also be used.

In the example of FIG. **1**, the keypad **114** is used for entry of personalization parameters, but other input devices can be used such as touchpads, voice inputs, handwriting pads, pointing devices, and others. These input devices can be associated with, for example, voice or handwriting recognition methods. For convenience, such input devices are referred to as user input interfaces.

Referring to FIG. **2**, a method **200** of requesting personalized content based on, for example, an HTTP protocol includes a step **202** of selecting a content specific command such as, for example, a request for a specific Web page or connection to a particular data service. In a step **204**, content personalization parameters such as a device identifier and a user identifier are retrieved. Representative examples of such parameters include a cell phone serial number, other device serial number, and a SIM_ID. In a step **206**, a personalized content request is prepared based on the personalization parameters. The personalized content request generally includes a specification of a selected content with a command that can be represented as Get contentaddress/content. Content personalization parameters such as device and user personalization parameters can be specified by, for example, corresponding headers such as Device Serial No: XYZ and User ID: 123, respectively. In a step **208**, the personalized content request is transmitted to, for example, a wireless network or other communication network. Based on the content personalization parameters, a content provider can configure, for example, a web page content.

Personalized content requests can also be configured in other ways. An alternative method **300** of content personalization is illustrated in FIG. **3**. In a step **302**, a request for specific content at an address Contentaddress.com is selected and in a step **304** this request is transmitted. In a step **306**, a request for identification is received from, for example, a content provider or a network component such as a Mobile

Switching Center (MSC) and in step **308**, one or more or of a user identifier, a device identifier, or a device serial number, or other identifier is selected. In a step **310**, the selected identifiers are transmitted as, for example, a portion of an HTTP header. The method **300** can be configured to transmit fewer or additional personalization parameters in one or more transmission steps. For example, a content request can initially include a device serial number in an HTTP header, as, for example, "Manufacturer_Name/Model_No." After a request for identification is received, a user can determine if additional identifiers are to be transmitted in the step **308**. If transmission of additional identifiers is selected, an additional header or a modified header is transmitted that includes, for example, one or both of a device serial number and a user identifier. For example, such a header can include device maker, device model number, device serial number, and SIM card serial number (SIM_ID) in an HTTP header of the form "Maker/Model_No/DevSerNo/SIM_Ser_No." Such a header permits user and device identification and permits content personalization based on either or both. The methods of FIGS. **2-3** are illustrated with reference to HTTP protocols, but methods can be implemented in other ways.

With reference to FIG. **4**, a method **400** of configuring a content provider for personalized content includes receiving one or more personalization identifiers including, for example, one or more of a device maker, a device model number, a device serial number, and a SIM card serial number in step **402**. In the method **402** of FIG. **4**, a device identifier deviceID and a user identifier userID are provided, but other personalization identifiers or other combinations of one or more such identifiers can be provided. In the example of FIG. **4**, personalization identifiers associated with a single user are associated with two or more communication devices. For example, a single user identifier userID can be associated with two or more cell phones, personal digital assistants, handheld computers, or other communication devices. As used herein, a combination of identifiers such as a device identifier and a user identifier are referred to as a user profile. A collection of one or more user profiles is referred to as a family of user profiles. A family of user profiles for a user having two cell phones associated with respective device identifiers phone_1 and phone_2 includes the user profiles (phone_1, userID) and (phone_2, userID). In addition, a user profile can include a content identifier, a device parameter, or other parameters. For example, a user profile based on device and user identifiers phone_1, userID, respectively, can include a content identifier such as MyHomePage to form the user profile (phone_1, userID, MyHomePage). In communication based on this example user profile, communication with MyHomePage is established.

User profiles are queried in a step **404** to determine if a particular communication request is associated with a known user profile. If a user profile corresponding to the received personalization parameters (deviceID, userID) is not located, the user can be requested to establish, edit, or modify a user profile in a step **405**. Based the personalization parameters, a personalized content request is initiated in a step **406**. As a specific example of such personalization, content requests from a first device can be associated with content types or content formats that can differ from a second device. For example, a user can establish a user profile so that a first cell phone can be associated with a user preference for sports related content. A second cell phone, associated with the same user, can be associated with a preference for financial data. Thus the user profiles (phone_1, userID) and (phone_2, userID) can be associated with sports content and financial content, respectively. When use of the first or second cell phones is initiated, specific types of content can be requested, without requiring querying the user. For example, a user connection to an internet-based news service can be personalized for sports or financial data based on user profiles. Alternatively, the step **405** can be omitted or content personalization can be provided for a single user profile associated with a particular communication device.

Personalized content appropriate for a particular communication device can be based on properties of the communication device, user location, user calendar data, or otherwise configured. For example, a communication device with a low resolution display can request personalized content that is suitable for the display while a communication device with a higher resolution display requests higher resolution images. Alternatively, a user can associate a particular cell phone with use in a particular location or application, and configure a user profile accordingly. For example, a selected cell phone can be configured for use at home and for which sports content is requested. A particular communication device can include a sophisticated audio system or completely lack audio. Accordingly, the user profiles of such devices can be associated with audio-rich content or to avoid audio content. Communication devices configured especially for audio applications can be personalized based on device audio capabilities via, for example, a device identifier and according to user musical or other preferences based on a user identifier. A family of profiles can be associated with calendar data, time of day data, or otherwise configured. For example, a user profile associated with identification of restaurant locations can be used to provide appropriate restaurant data based on time of day so that coffee shop content is preferred in the morning. Geographical data can also be used in conjunction with a user profile. As a result of such personalization, user-preferred content can be selected and delivered and unwanted content can be avoided, thus conserving network data capacity while providing an apparently faster or more useful network.

In other examples, users can establish one or more user personalization profiles associated with a communication device to select content for delivery. For example, a communication device having audio capabilities can be associated with a user profile that is configured to block or limit delivery of audio content. As a result, content is delivered based on user preferences and not solely on communication device capabilities. In some examples, types of content appropriate for a particular communication device are included in a hypertext transfer protocol (HTTP) header that is delivered to a content provider. Based on a user personalization profile, one or more of these content types can be requested, or delivery of one or more content types can be indicated as unwanted. Such user profiles permit a user to conserve communication bandwidth, communication device processing power, battery life, or other parameter based on user preferences.

Referring to FIG. **5**, a method **500** of providing personalized content includes a step **502** of receiving personalization identifiers such as a device serial number DSN and a SIM card serial number SIM_ID. Additional, fewer, or alternative personalization identifiers can be used. In a step **504**, the device serial number DSN and the SIM card serial number SIM_ID are compared with a family of user profiles that are retrieved from a database **506**. If the device serial number DSN and the SIM card serial number SIM_ID do not appear in a user profile in the family and/or the device serial number DSN is unrecognized, association of a content request with a particular user is incomplete, and standard content parameters are assigned in a step **510**. Such standard content parameter can be configured generically to be neither device specific nor

user specific. Alternatively, if a user profile is not identified, a profile development procedure **511** can be executed. For example, the device serial number DSN and the SIM card serial number SIM_ID can be used to define a user profile that is provided to the profile database **506** in a step **513**. The device serial number DSN and the SIM card serial number SIM_ID can be provided to the profile database **506**, based on communication based on parameters associated with generic content. If a device specific identifier such as a device serial number matches a stored profile and an associated user identifier is unmatched, device specific content parameters are assigned in a step **512**. Alternatively, content personalization parameters can be configured so that device specific customization is available only to users associated with additional, non-device specific personalization identifiers such as the SIM card serial number. For example, a service subscriber could access device customization/personalization features only as a subscriber to a customization/personalization service that is associated with a user identifier. If the device serial number DSN and the SIM card serial number correspond to a user profile in the database, user-specific personalization parameters are established in a step **514**.

With reference to FIG. **6**, a communication system **600** for providing personalized content to a wireless communication device such as a cell phone **602** that is in communication with a wireless network **605**. A content provider **610** includes a personalization interface **604** that is configured to receive a user identifier and a device identifier from the cell phone **602** and typically includes a processor such as a personal computer, workstation, parallel processor, processor network, or other devices. The content provider **610** can be configured to provide data and services such as financial data, entertainment, messaging, or other services. The personalization interface is also configured to receive content instructions from, for example, the cell phone **602**, an internet connection, or from a registration database **606** based on stored user preferences or user preferences that are provide in other ways. The cell phone **602** includes a processor **603** configured to transmit personalization identifiers to the personalization interface **604** and that can be obtained from, for example, a SIM **611**. The content provider **610** can be configured to communicate with the cell phone **602** via a Publicly Switched Telephone Network (PSTN) **612** or directly with the wireless network **605**. In some examples, the registration database **606** can be included in the wireless network **605** and configured for access by one or more content providers. For example, an internal content provider **615** can be included in the wireless network **605** and personalization data provided only for content providers within the wireless network **605**.

Representative embodiments are described above. In other examples, a user identifier is provided that is based on, for example, a stored value provided by, for example, a SIM card or otherwise provided. The stored value can be assigned by a user or pre-assigned by a manufacturer or communication device vendor. In some examples, security of personal information is enhanced by independent selection of such values without association with sensitive personal information such as subscriber phone numbers, billing information, or other sensitive information.

In some examples, content personalization is described with reference to obtaining data from a particular source by, for example, targeting a selected web address, connecting to a selected information service, selecting a data category, or a data type such as audio, video, or text data. In other examples, content personalization includes personalization based on information presentation parameters such as image resolution, audio quality, text page size, or other parameters. Such information presentation parameters can be selected based upon one or both of a user identifier and a device identifier. In addition, content personalization based on data source, data type, or information presentation parameters can be configured in conjunction with user location or user calendar information.

User profiles can be used to provide subclasses of content personalization. For example, a user connection to a game download service can be personalized based on a user profile. A user can associate a particular communication device with resources available in the device such as memory, processing power, display resolution, and/or other parameters. The game service then presents the user with downloads appropriate to the device resources based on the selected user profile. If the game service does not recognize the user profile, the user can be queried to establish a new or additional profile. In this and other examples, a content provider can be configured to deliver content based on one or both of a device identifier and a user identifier.

Example embodiments are described with reference to cell phones, but other mobile stations can be used. A mobile station typically includes a transceiver, an antenna, and control circuitry and can be mounted in a vehicle, used as a portable handheld device, and is configured to communicate with a base station. Base stations typically include one or more transmitters and receivers and are configured for full duplex communication with one or more mobile stations and a mobile switching center (MSC) or a mobile telephone switching office (MTSO). A MTSO generally includes a processor configured to monitor, track, arrange handoffs, and keep track of billing information as well as arrange communication with a wire-based communication system. A wireless network usually includes one or more mobile stations that communicate with one or more base stations that in turn communicate with a MSC or MTSO.

Aspects of the invention are described above with reference to example embodiments. It will be apparent to those skilled in the art that these embodiments can be altered in arrangement and detail without departing from the scope of the invention and these representative embodiments should not be taken to limit the scope of the invention. We claim all that is encompassed by the appended claims.

What is claimed is:

1. A method of providing personalized content to a wireless device coupled to a wireless communication network having a content provider, the wireless device comprising a device identifier, authentication information, and a subscriber identity module (SIM) having a serial number assigned, at least in part, by a manufacturer of the SIM, the wireless device being configured to transmit the authentication information and an anonymous user identifier to the wireless communication network, the anonymous user identifier being based, at least in part, on the serial number and being unrelated to both the device identifier and the authentication information, the method comprising:

receiving the authentication information;

performing an authentication process based on the authentication information and not based on the anonymous user identifier, the authentication process authenticating the mobile station with the wireless communication network; and

after the mobile station is authenticated with the wireless communication network, at the content provider:

receiving an anonymous user identifier from the wireless device over the wireless communication network;

selecting content based on the anonymous user identifier; and

providing the selected content to the wireless device over the wireless communication network.

2. The method of claim 1, wherein the selected anonymous user identifier is the serial number of the SIM.

3. The method of claim 1, for use with a wireless device configured to transmit the device identifier to the wireless communication network, the method further comprising after the mobile station is authenticated with the wireless communication network, at the content provider:

receiving the device identifier from the wireless device over the wireless communication network;

selecting content based on the anonymous user identifier and the device identifier; and

providing the selected content to the wireless device over the wireless communication network.

4. The method of claim 3, wherein the content provider has a plurality of user profiles, each user profile of the plurality of user profiles having a device identifier and an anonymous user identifier, the method further comprising at the content provider:

selecting a user profile from the plurality of user profiles, the selected user profile having a device identifier identical to the device identifier of the wireless device and an anonymous user identifier identical to the anonymous user identifier of the wireless device; and

selecting content based on the selected user profile.

5. The method of claim 1, wherein the selected anonymous user identifier is a hash value obtained by applying a hash function to the serial number of the SIM.

6. The method of claim 1, wherein the authentication information includes a mobile station ISDN number (MSISDN).

7. The method of claim 1, wherein the authentication information includes a mobile subscriber identity.

8. The method of claim 7, wherein the mobile subscriber identity is an international mobile subscriber identity (IMSI).

9. The method of claim 1, wherein the authentication information includes a mobile subscriber identity and a mobile station number.

10. The method of claim 9, wherein the mobile subscriber identity is an international mobile subscriber identity (IMSI) and the mobile station number is a mobile station ISDN number (MSISDN).

11. The method of claim 1, further comprising:

receiving anonymous personalization data from the wireless device; and

personalizing the selected content for the wireless device based on the anonymous personalization data.

12. The method of claim 1, further comprising:

after the mobile station is authenticated with the wireless communication network, at the content provider, transmitting the anonymous user identifier across the wireless communication network to the content provider.

13. The method of claim 1, further comprises:

before providing the selected content to the wireless device over the wireless communication network, personalizing the selected content based on at least one information presentation parameter.

14. The method of claim 13, wherein the at least one information presentation parameter comprises image resolution, audio quality, or text page size.

15. The method of claim 1, wherein selecting content based on the anonymous user identifier comprises using the anonymous user identifier to obtain a user profile and selecting the selected content based at least in part on the user profile.

16. The method of claim 15, wherein the user profile specifies one or more resources available on the wireless device, and the selected content is selected based at least in part on the one or more resources available on the wireless device.

17. The method of claim 16, wherein the one or more resources available on the wireless device comprise memory, processing power, or display resolution.

18. The method of claim 1, wherein the wireless device is located at a location, and the method further comprises:

before providing the selected content to the wireless device over the wireless communication network, personalizing the selected content based on the location of the wireless device.

19. The method of claim 1, further comprises:

before providing the selected content to the wireless device over the wireless communication network, personalizing the selected content based on geographical data.

20. The method of claim 1, further comprises:

before providing the selected content to the wireless device over the wireless communication network, personalizing the selected content based on calendar information.

21. The method of claim 1, further comprises:

before providing the selected content to the wireless device over the wireless communication network, personalizing the selected content based on time of day.

22. The method of claim 1, further comprises:

before providing the selected content to the wireless device over the wireless communication network, identifying a user profile having user preference information associated with the anonymous user identifier and selecting the selected content based on the user preference information of the user profile.

23. The method of claim 22, wherein the user preference information of the user profile instructs the content provider not to provide selected types of content.

24. The method of claim 1, wherein receiving the anonymous user identifier from the wireless device over the wireless communication network comprises receiving the anonymous user identifier in an HTTP protocol header.

25. The method of claim 1, further comprising:

at the content provider, requesting the anonymous user identifier from the wireless device.

26. The method of claim 1 for use with a wireless communication network comprising a network component, the method further comprising:

at the network component, requesting the anonymous user identifier from the wireless device.

27. The method of claim 26, wherein the network component comprises a mobile switching center.

28. The method of claim 1, further comprises:

at the content provider, obtaining the selected content from a content source; and

before providing the selected content to the wireless device over the wireless communication network comprises, personalizing the selected content based on the content source.

29. The method of claim 1, wherein the selected content has a content type, and the method further comprises:

before providing the selected content to the wireless device over the wireless communication network comprises, personalizing the selected content based on the content type.

* * * * *

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(54) **PICTURE COMMUNICATIONS SYSTEM AND ASSOCIATED NETWORK SERVICES**

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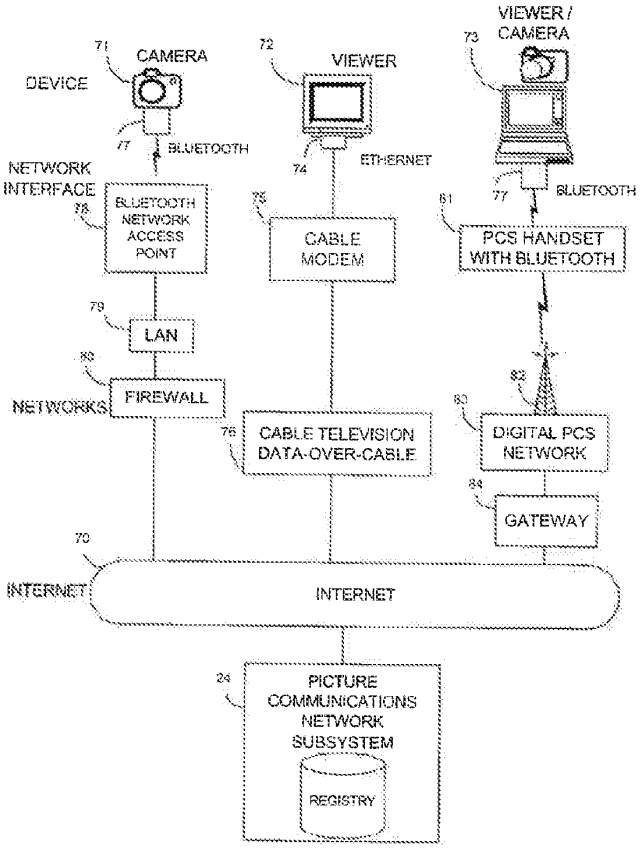
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(51) **Int. Cl.**[7] **H04N 7/173**

(52) **U.S. Cl.** **725/105**

(57) **ABSTRACT**

A real-time picture communications system (15) including a picture communications network subsystem (26) provides real-time picture communication services between users (21), devices (22), and/or groups of users, devices, and other groups. Examples of devices include cameras, viewers, keypads, writing tablets, microphones, telephones, and combinations thereof. One or more protocol communications nodes (27) are connected to one or more networks to provide communication between the network and the picture communications network subsystem. A registry database (28) includes user information (86), device information (87) and group information (88). A control subsystem (29) processes requests and executes instructions, such as an attach instruction and instructions that establish real-time communication services responsive to an authenticated request by a user or a device to the extent allowed by the various access rights of any users, devices and groups.



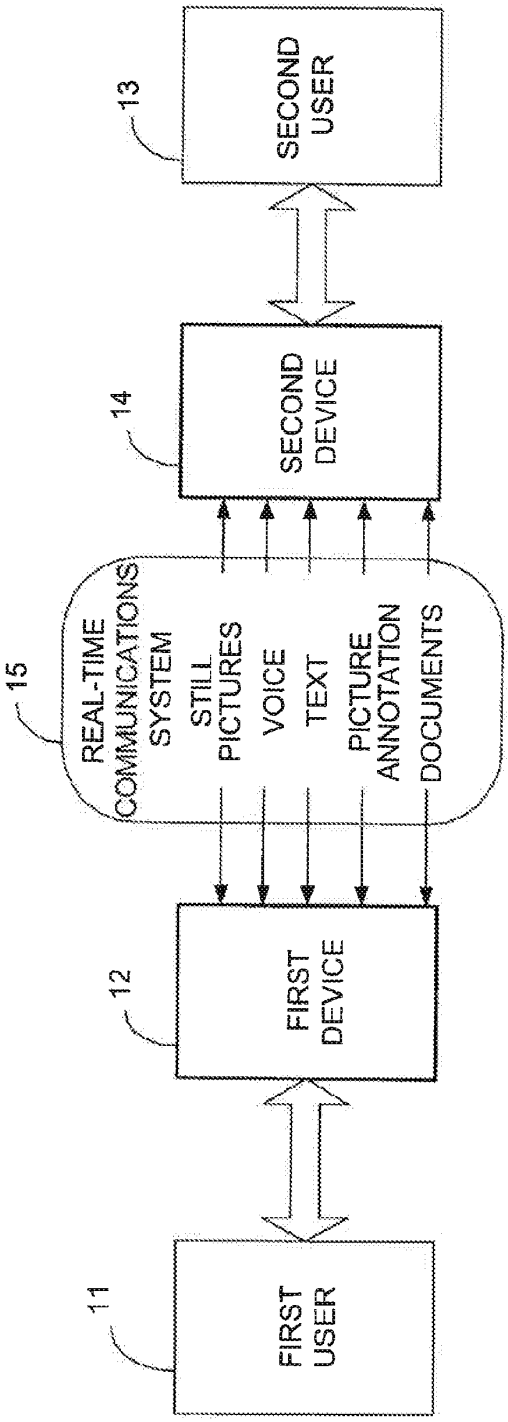

11
FIRST USER
12
FIRST DEVICE
13
SECOND USER
14
SECOND DEVICE
15
REAL-TIME COMMUNICATIONS SYSTEM
STILL PICTURES
VOICE
TEXT
PICTURE ANNOTATION
DOCUMENTS

FIG. 1

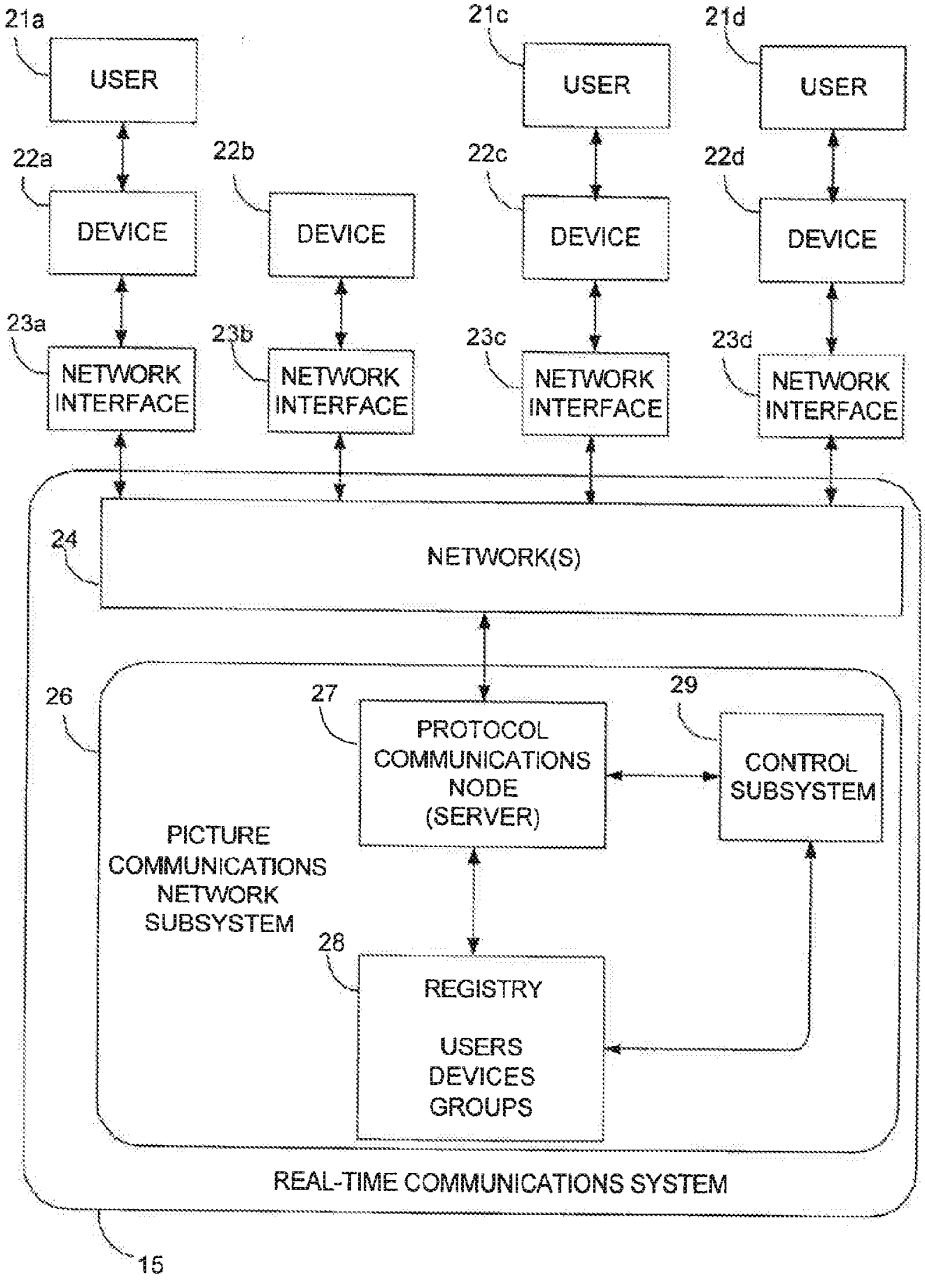

21a
USER
21c
USER
21d
USER
22a
DEVICE
22b
DEVICE
22c
DEVICE
22d
DEVICE
23a
NETWORK INTERFACE
23b
NETWORK INTERFACE
23c
NETWORK INTERFACE
23d
NETWORK INTERFACE
24
NETWORK(S)
26
27
PROTOCOL COMMUNICATIONS NODE (SERVER)
29
CONTROL SUBSYSTEM
PICTURE COMMUNICATIONS NETWORK SUBSYSTEM
28
REGISTRY
USERS
DEVICES
GROUPS
REAL-TIME COMMUNICATIONS SYSTEM
15

FIG. 2

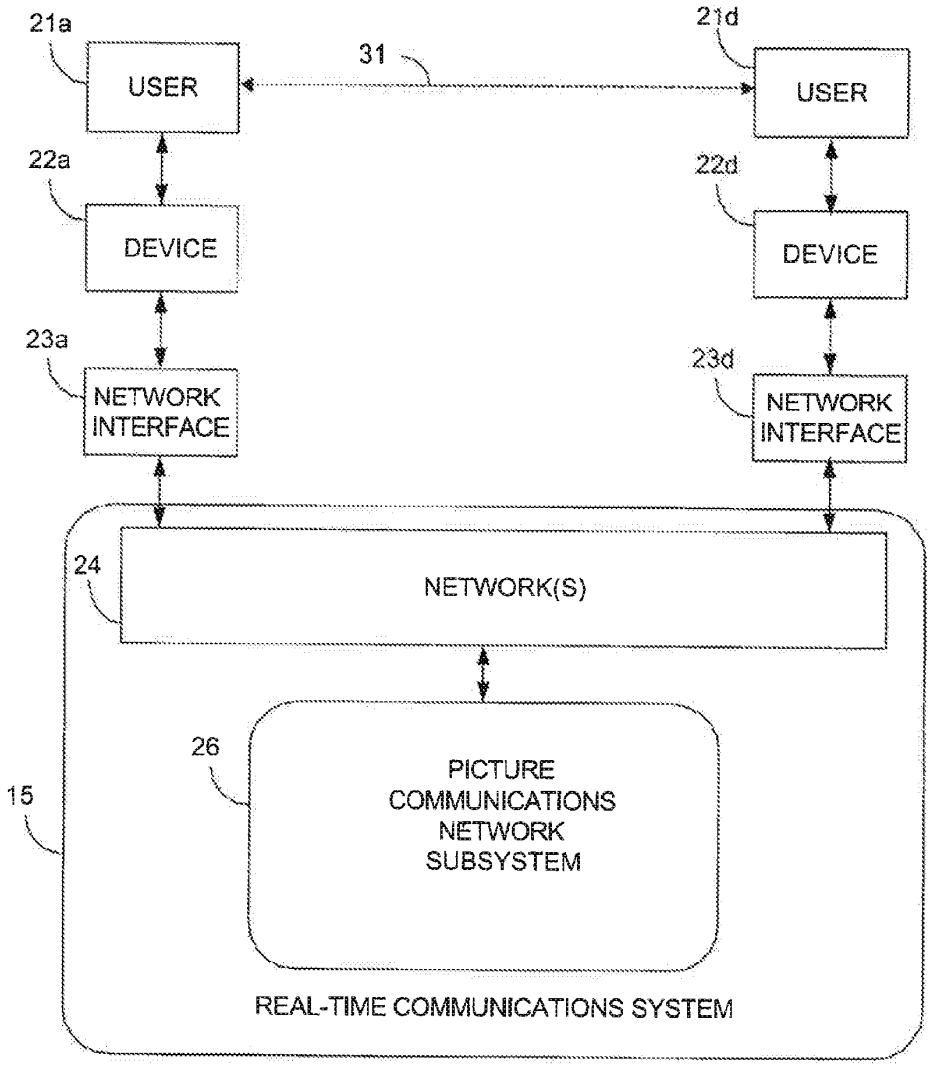

21a
USER
31
21d
USER
22a
DEVICE
22d
DEVICE
23a
NETWORK INTERFACE
23d
NETWORK INTERFACE
24
NETWORK(S)
26
PICTURE COMMUNICATIONS NETWORK SUBSYSTEM
15
REAL-TIME COMMUNICATIONS SYSTEM

Fig. 3

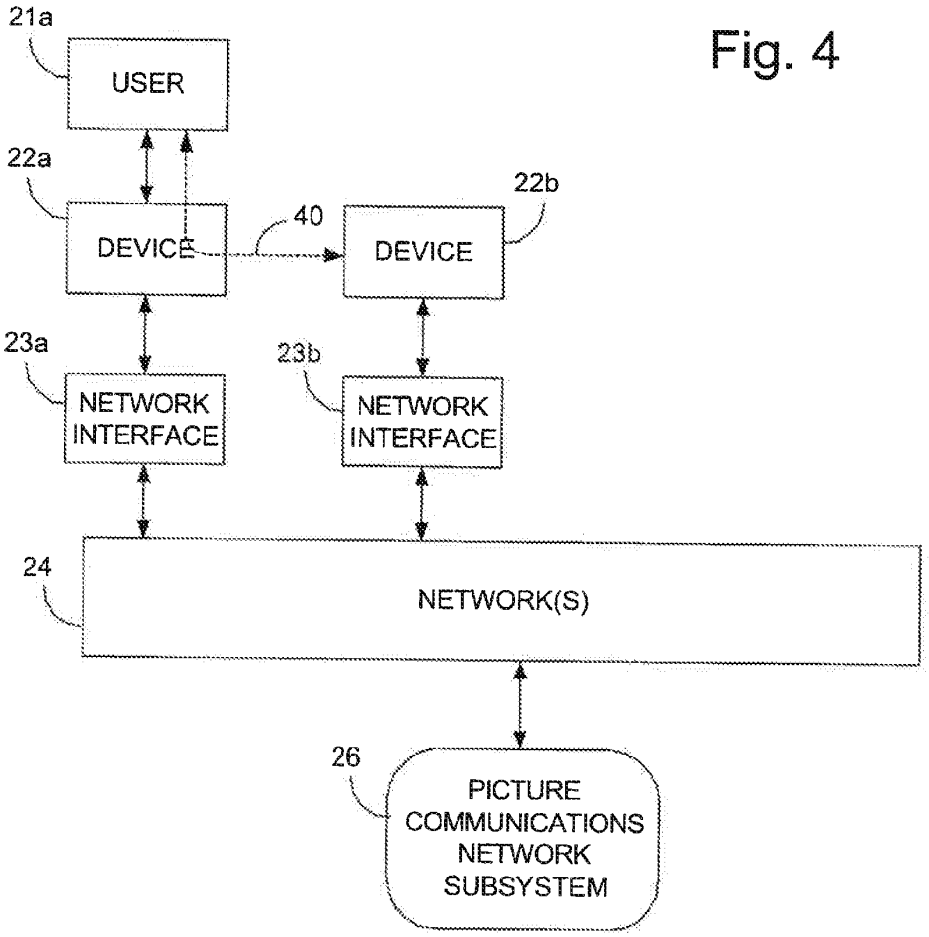

21a
USER
22a
DEVICE
40
22b
DEVICE
23a
NETWORK INTERFACE
23b
NETWORK INTERFACE
24
NETWORK(S)
26
PICTURE COMMUNICATIONS NETWORK SUBSYSTEM

Fig. 4

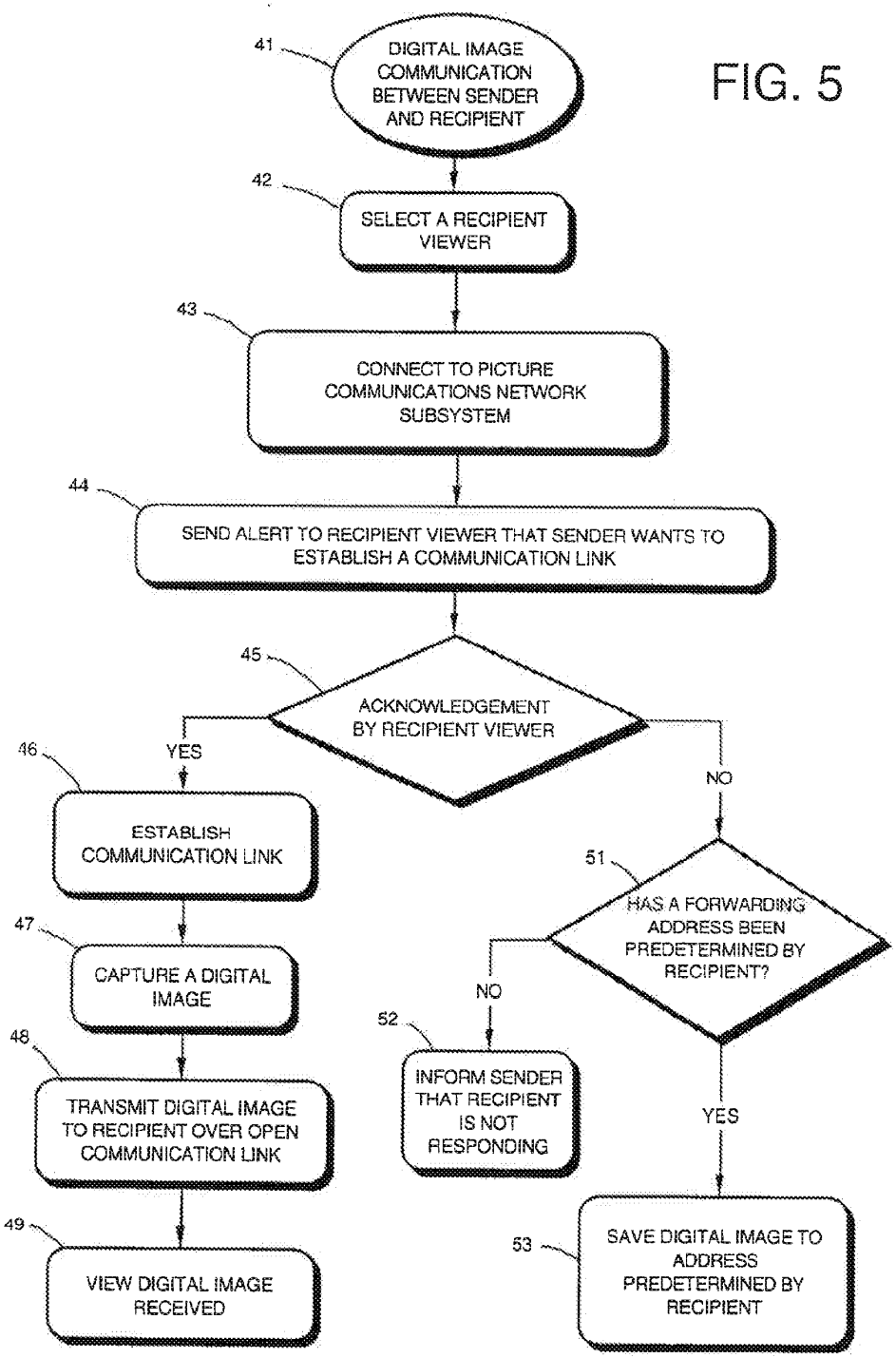
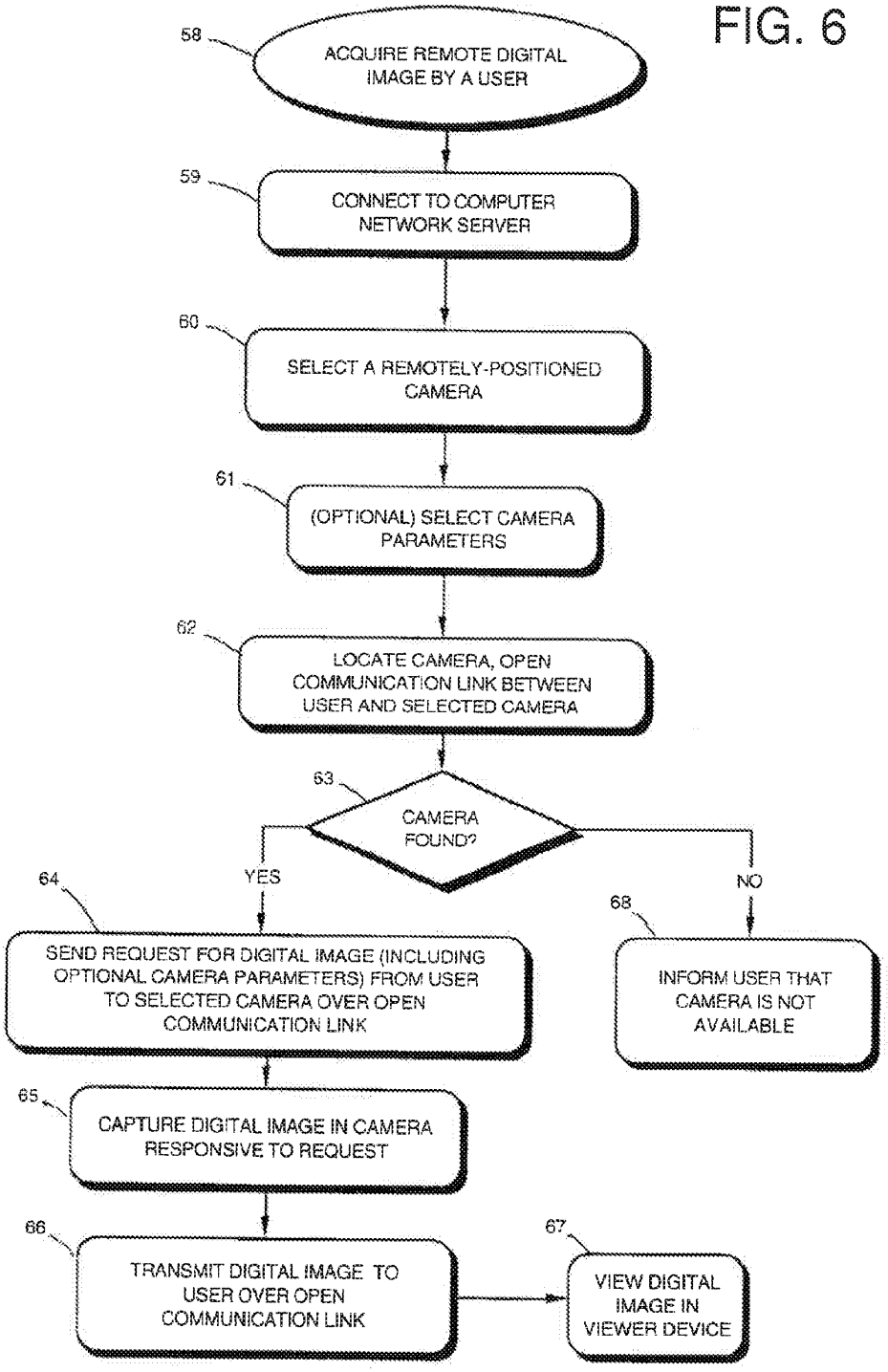

41
DIGITAL IMAGE COMMUNICATION BETWEEN SENDER AND RECIPIENT
42
SELECT A RECIPIENT VIEWER
43
CONNECT TO PICTURE COMMUNICATIONS NETWORK SUBSYSTEM
44
SEND ALERT TO RECIPIENT VIEWER THAT SENDER WANTS TO ESTABLISH A COMMUNICATION LINK
45
ACKNOWLEDGEMENT BY RECIPIENT VIEWER
YES
NO
46
ESTABLISH COMMUNICATION LINK
47
CAPTURE A DIGITAL IMAGE
48
TRANSMIT DIGITAL IMAGE TO RECIPIENT OVER OPEN COMMUNICATION LINK
49
VIEW DIGITAL IMAGE RECEIVED
51
HAS A FORWARDING ADDRESS BEEN PREDETERMINED BY RECIPIENT?
NO
YES
52
INFORM SENDER THAT RECIPIENT IS NOT RESPONDING
53
SAVE DIGITAL IMAGE TO ADDRESS PREDETERMINED BY RECIPIENT

FIG. 5

FIG. 6


58
ACQUIRE REMOTE DIGITAL IMAGE BY A USER
59
CONNECT TO COMPUTER NETWORK SERVER
60
SELECT A REMOTELY-POSITIONED CAMERA
61
(OPTIONAL) SELECT CAMERA PARAMETERS
62
LOCATE CAMERA, OPEN COMMUNICATION LINK BETWEEN USER AND SELECTED CAMERA
63
CAMERA FOUND?
YES
NO
64
SEND REQUEST FOR DIGITAL IMAGE (INCLUDING OPTIONAL CAMERA PARAMETERS) FROM USER TO SELECTED CAMERA OVER OPEN COMMUNICATION LINK
68
INFORM USER THAT CAMERA IS NOT AVAILABLE
65
CAPTURE DIGITAL IMAGE IN CAMERA RESPONSIVE TO REQUEST
66
TRANSMIT DIGITAL IMAGE TO USER OVER OPEN COMMUNICATION LINK
67
VIEW DIGITAL IMAGE IN VIEWER DEVICE

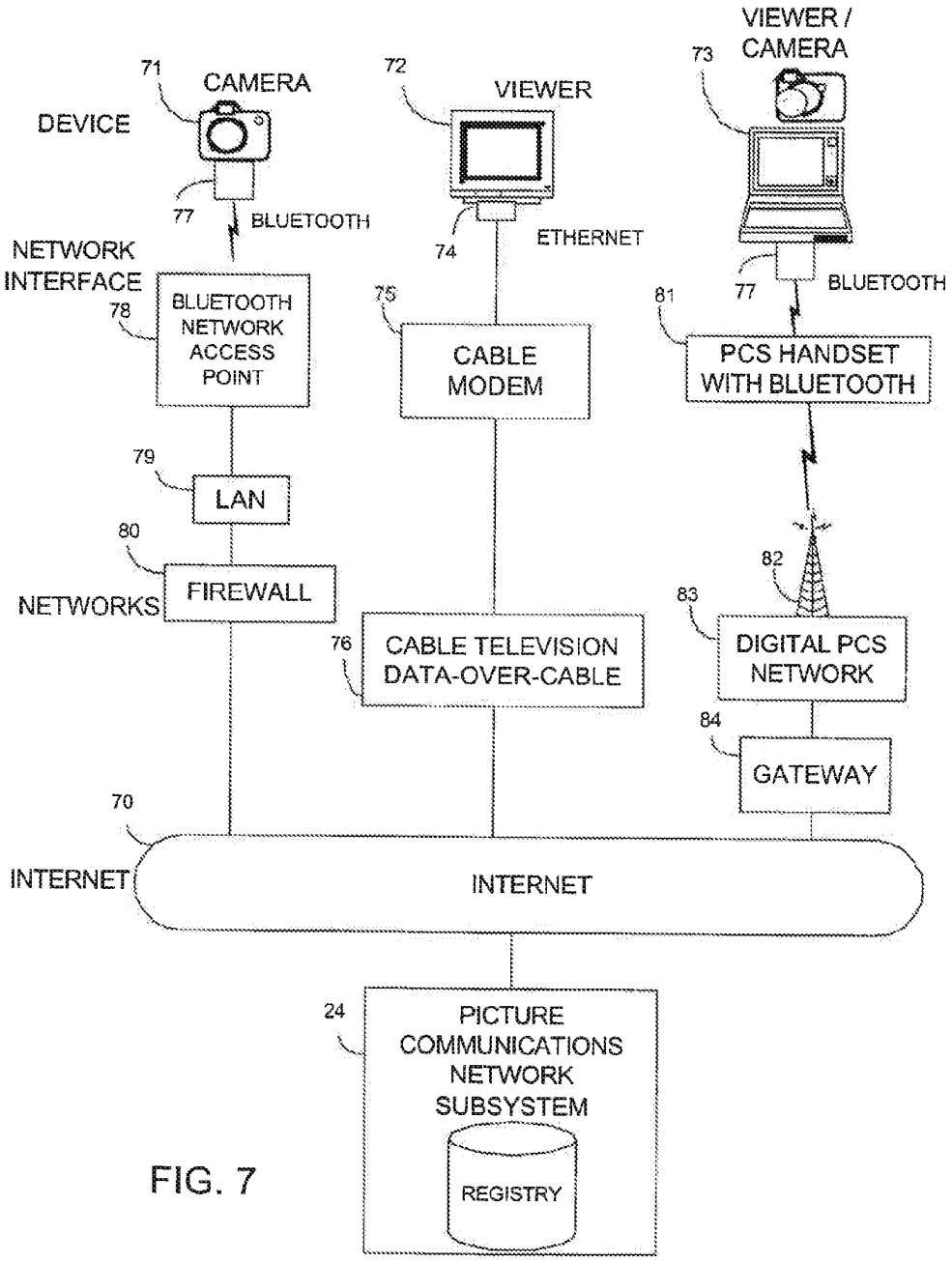

71
CAMERA
DEVICE
77
BLUETOOTH
NETWORK
INTERFACE
78
BLUETOOTH
NETWORK
ACCESS
POINT
79
LAN
80
NETWORKS
FIREWALL
70
INTERNET
INTERNET
72
VIEWER
74
ETHERNET
75
CABLE
MODEM
76
CABLE TELEVISION
DATA-OVER-CABLE
VIEWER /
CAMERA
73
77
BLUETOOTH
81
PCS HANDSET
WITH BLUETOOTH
82
83
DIGITAL PCS
NETWORK
84
GATEWAY
24
PICTURE
COMMUNICATIONS
NETWORK
SUBSYSTEM
REGISTRY

FIG. 7

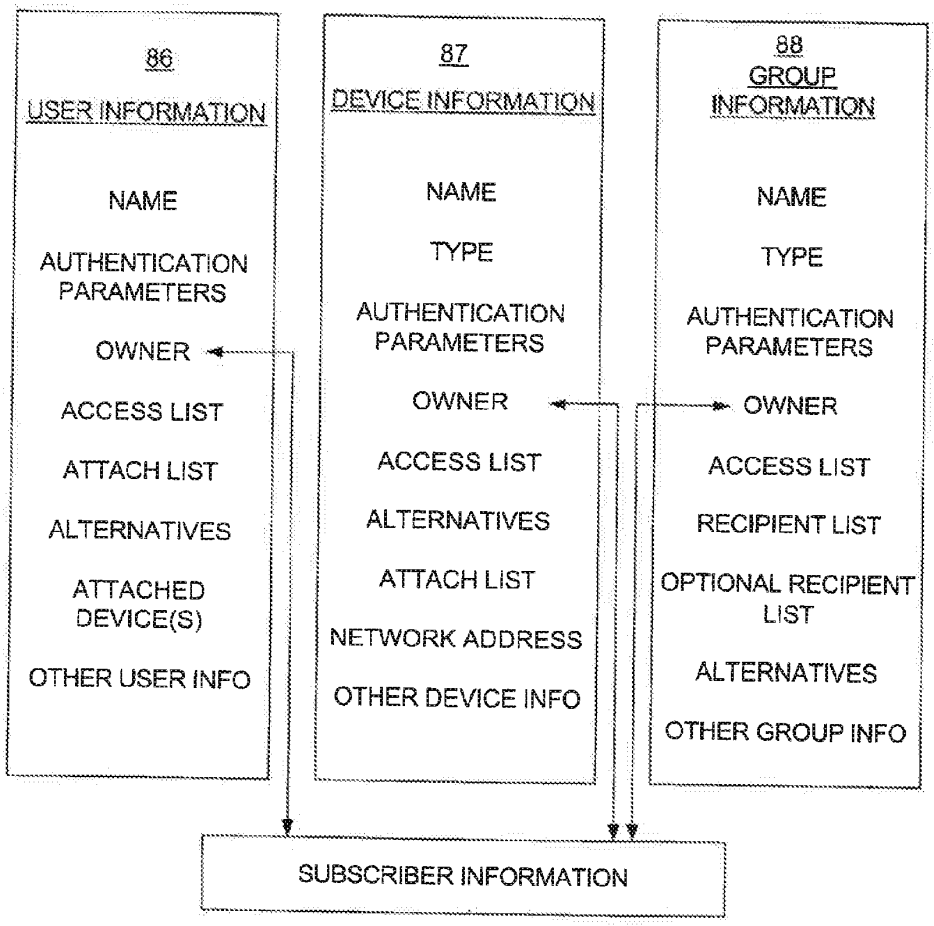

86
USER INFORMATION
NAME
AUTHENTICATION PARAMETERS
OWNER
ACCESS LIST
ATTACH LIST
ALTERNATIVES
ATTACHED DEVICE(S)
OTHER USER INFO
87
DEVICE INFORMATION
NAME
TYPE
AUTHENTICATION PARAMETERS
OWNER
ACCESS LIST
ALTERNATIVES
ATTACH LIST
NETWORK ADDRESS
OTHER DEVICE INFO
88
GROUP INFORMATION
NAME
TYPE
AUTHENTICATION PARAMETERS
OWNER
ACCESS LIST
RECIPIENT LIST
OPTIONAL RECIPIENT LIST
ALTERNATIVES
OTHER GROUP INFO
SUBSCRIBER INFORMATION

FIG. 8

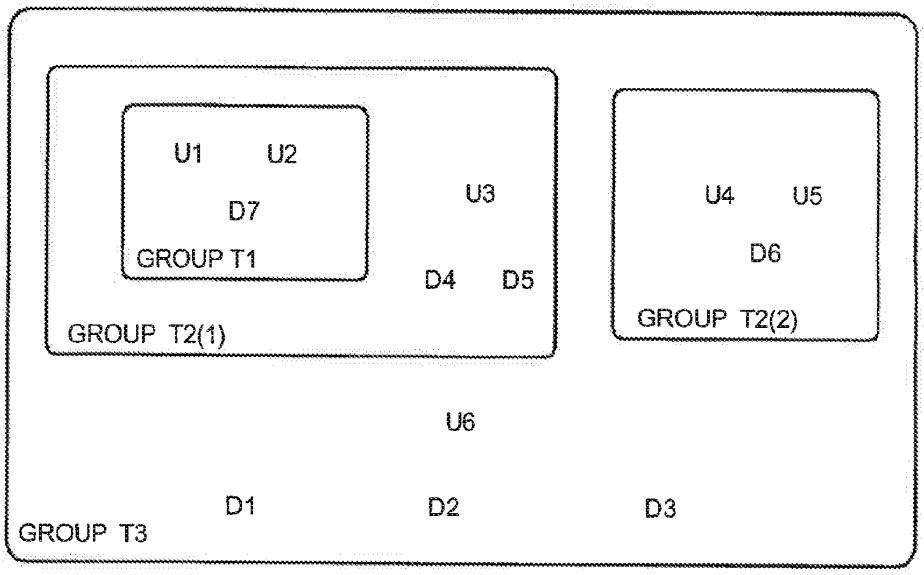

U1
U2
D7
GROUP T1
U3
D4
D5
GROUP T2(1)
U4
U5
D6
GROUP T2(2)
U6
D1
D2
D3
GROUP T3

Fig. 9

FIG. 10

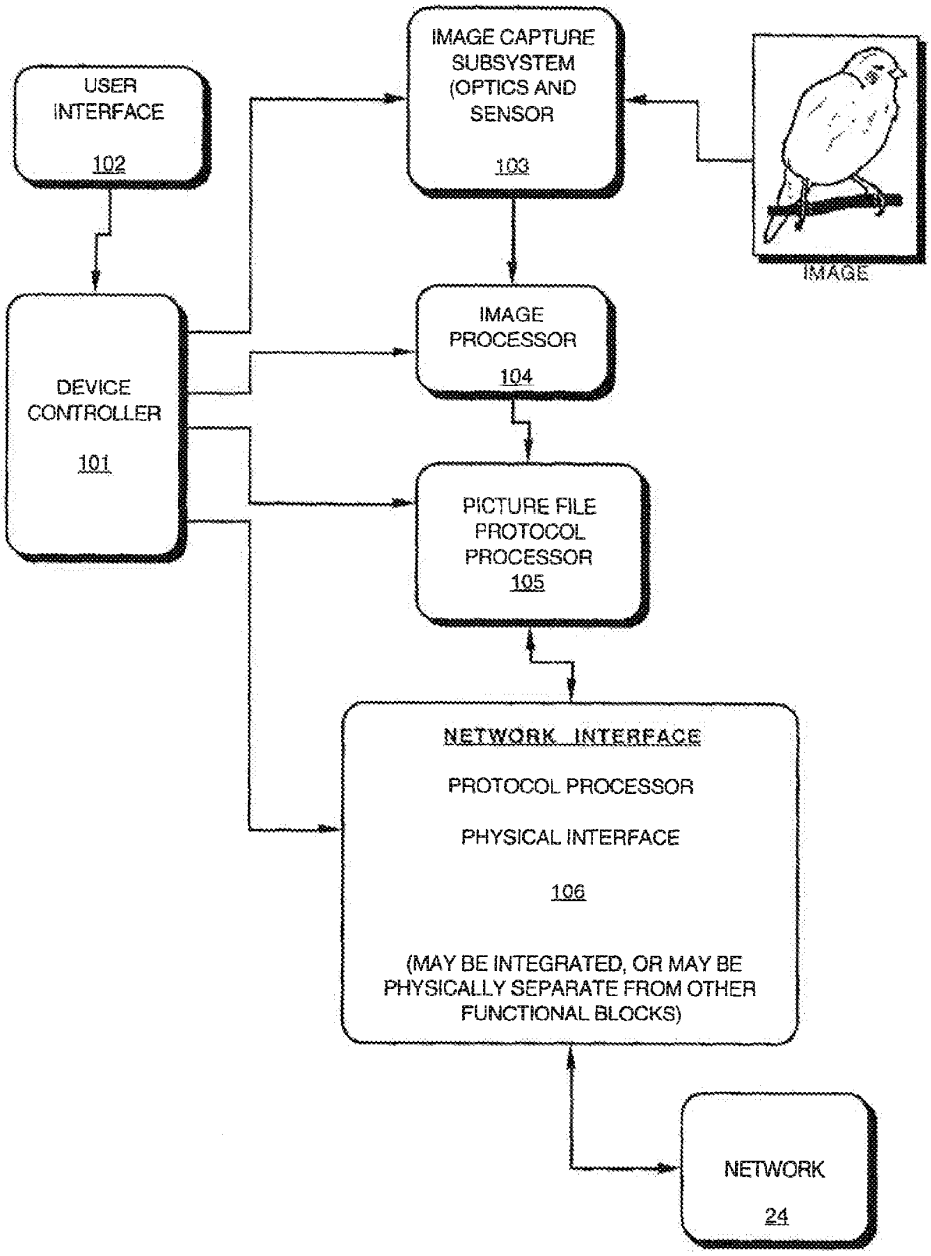
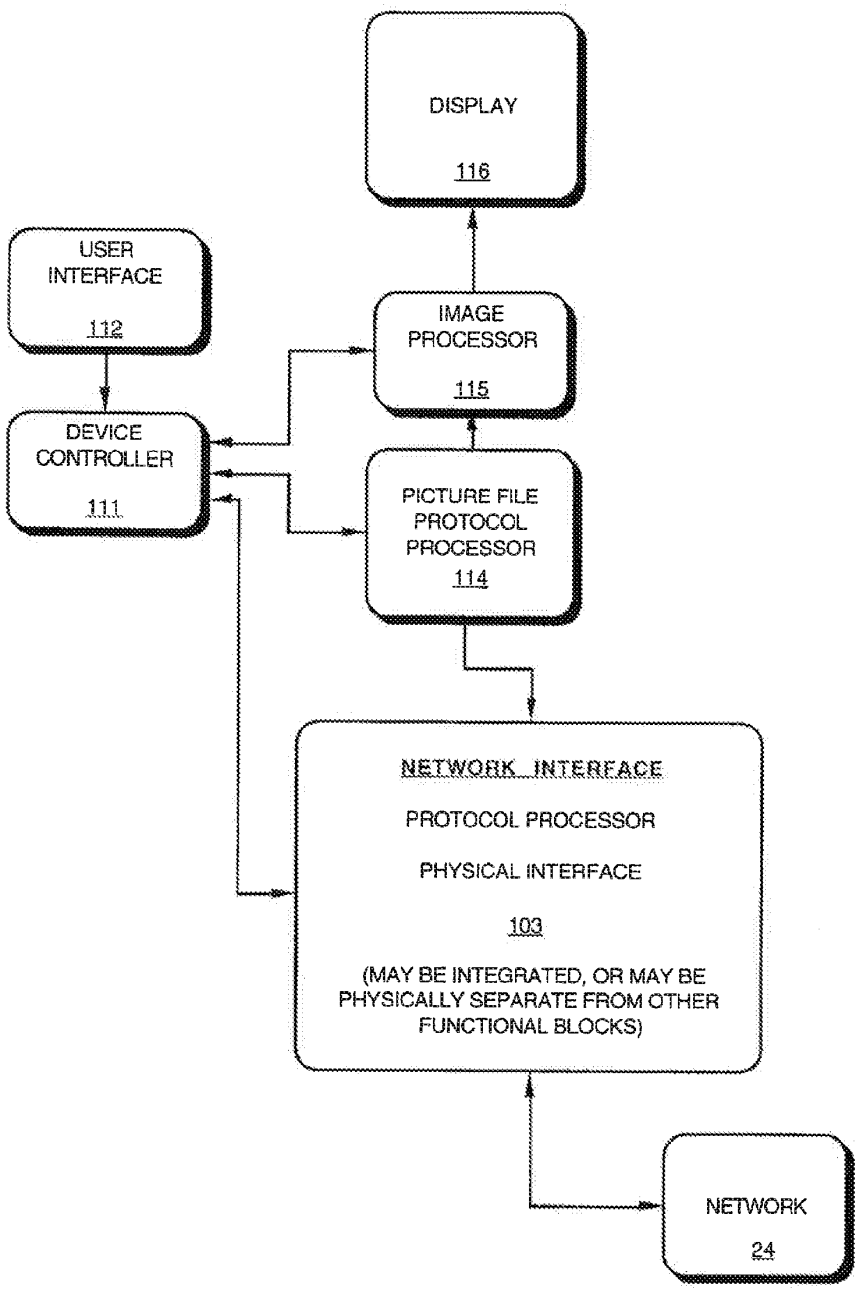

USER INTERFACE
102
IMAGE CAPTURE SUBSYSTEM (OPTICS AND SENSOR
103
IMAGE
DEVICE CONTROLLER
101
IMAGE PROCESSOR
104
PICTURE FILE PROTOCOL PROCESSOR
105
NETWORK INTERFACE
PROTOCOL PROCESSOR
PHYSICAL INTERFACE
106
(MAY BE INTEGRATED, OR MAY BE PHYSICALLY SEPARATE FROM OTHER FUNCTIONAL BLOCKS)
NETWORK
24

FIG. 11


DISPLAY
116
USER INTERFACE
112
IMAGE PROCESSOR
115
DEVICE CONTROLLER
111
PICTURE FILE PROTOCOL PROCESSOR
114
NETWORK INTERFACE
PROTOCOL PROCESSOR
PHYSICAL INTERFACE
103
(MAY BE INTEGRATED, OR MAY BE PHYSICALLY SEPARATE FROM OTHER FUNCTIONAL BLOCKS)
NETWORK
24

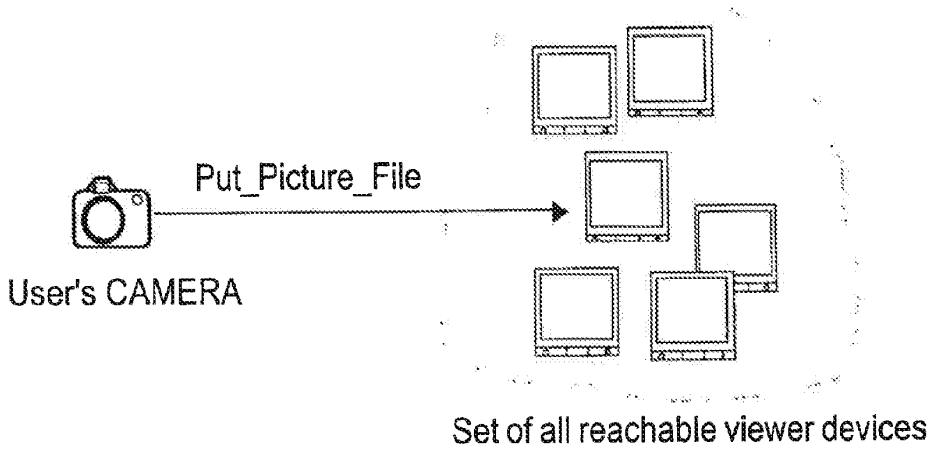

Put_Picture_File
User's CAMERA
Set of all reachable viewer devices

Fig. 12

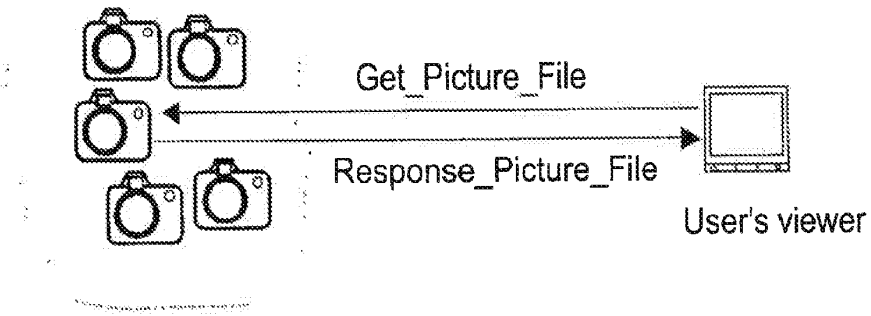

Get_Picture_File
Response_Picture_File
User's viewer
Set of all reachable camera devices

Fig. 13

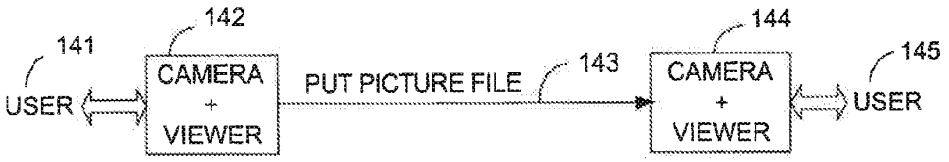


FIG. 14

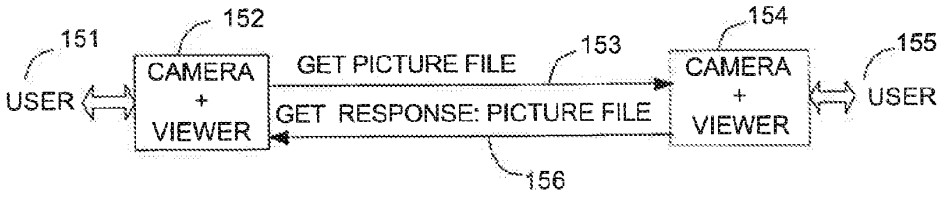


FIG. 15

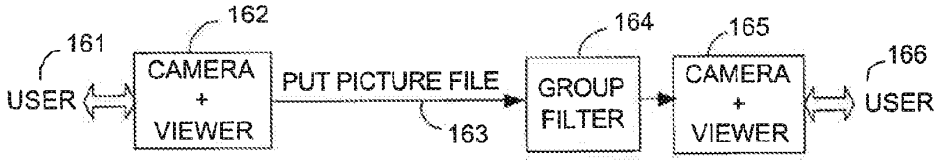


FIG. 16

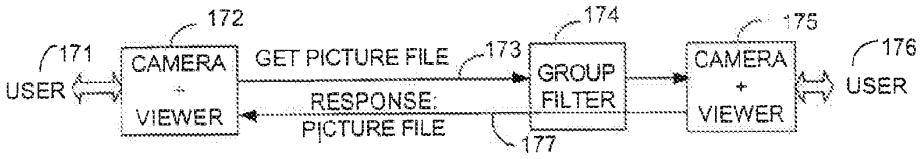


FIG. 17

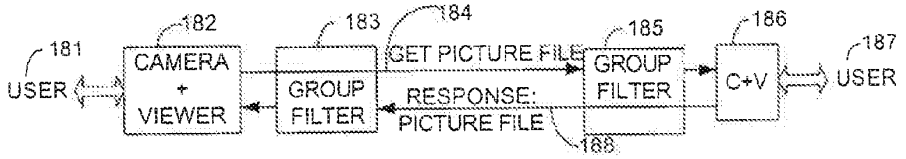


FIG. 18

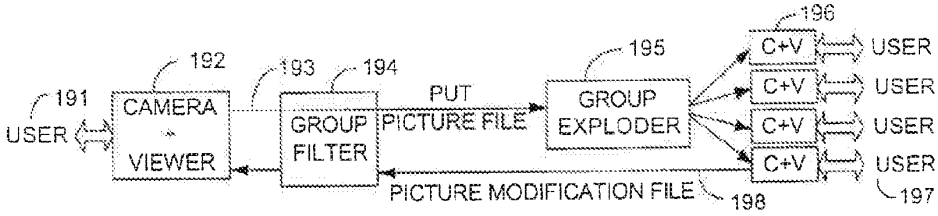


FIG.19

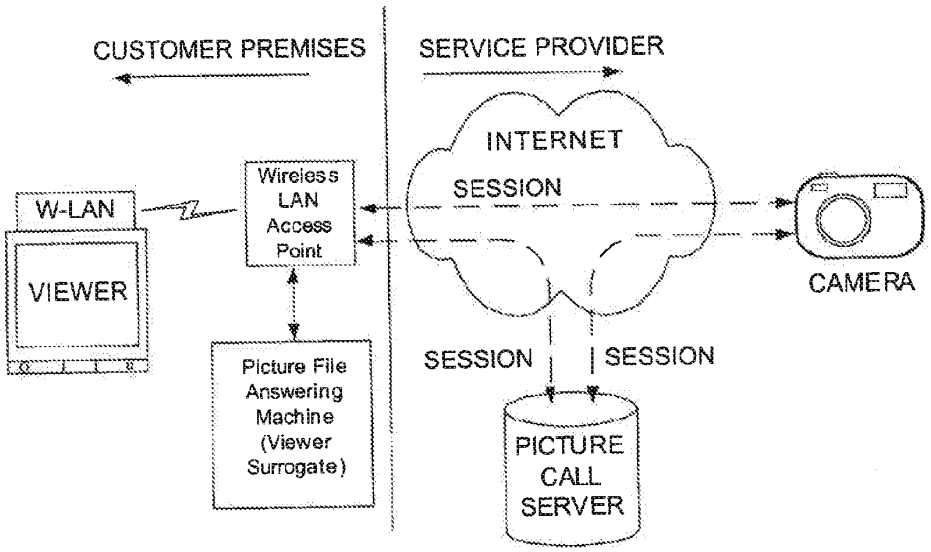

CUSTOMER PREMISES
SERVICE PROVIDER
INTERNET
SESSION
W-LAN
VIEWER
Wireless LAN Access Point
CAMERA
Picture File Answering Machine (Viewer Surrogate)
SESSION
SESSION
PICTURE CALL SERVER

FIG. 20

PICTURE COMMUNICATIONS SYSTEM AND ASSOCIATED NETWORK SERVICES

CROSS-REFERENCE TO RELATED APPLICATION

[0001] Priority is hereby claimed to U.S. Provisional Application No. 60/187,235, filed Mar. 3, 2000, entitled A Picture Communications System and Associated Network Services.

BACKGROUND OF THE INVENTION

[0002] 1. Field of the Invention

[0003] This invention relates to communication systems, and particularly to systems for real time communication of information.

[0004] 2. Description of Related Art

[0005] Despite the increasing use of electronic mail and other forms of electronic communication, the telephone system remains the most widely used and reliable forms of communication in the world today. The world is interconnected by a telephone network over which we speak and hear the spoken word, and engage in real time conversations to anyone, anywhere, at any time; for example a person in the U.S. can engage in a voice conversation with someone thousands of miles away in Europe, as if that person were in the same room. In summary, the telephone call is a fundamental and integral part of contemporary life.

[0006] Although a call to a distant telephone appears simple, it is actually the result of a complex interaction of underlying service providers and networks. Organizations are responsible for those networks, and working together to establish the standards that enable those networks to interconnect so perfectly. While many networks and service providers are involved, tight integration enables one to view it as a single public switched telephone network (PSTN).

[0007] The telephone system's great strengths-ubiquity, consistency, and reliability-rest squarely on technical standards that remain stable over the long term. One fundamental reason that telephones work so well is that they all work the same way; for example a person in the U.S. can telephone a person in Europe and be assured that voice communication will most likely proceed smoothly, without the frustrating incompatibilities experienced by other electronic forms of communication.

[0008] Since its inception, the telephone has largely remained a voice-oriented communication system. Other forms of communication, such as visual communication, have been largely ignored. Technical choices made nearly a century ago fundamentally constrain PSTN performance and design decisions. Although telephone lines are now commonly used to transmit data via modem or facsimile machines; this type of communication is not real-time. For example, facsimile (fax) machines are widely used to transfer monochrome printed images over the telephone network; however, fax use is limited primarily to documents and text for businesses due to the low resolution of faxed images, the relatively lengthy time period required to send a fax communication, and the performance compromises necessary to accommodate mechanical paper scanners and modem connections over a voice-grade dial-up switched circuit network.

[0009] Wide-ranging networks have been proposed and are under development to implement various forms of broadband communication. For example, the Third Generation Partnership Project (3GPP, see http://www.3gpp.org), the widely supported global wireless multimedia network initiative, proposes to serve our visual sense with video, providing dynamic, moving scenes. Unfortunately, video communication requires relatively large bandwidth, forcing a difficult tradeoff between image quality and cost control. Furthermore, video is difficult to reference, to sort, to store for ready retrieval, and to annotate when contrasted with still images. 3GPP does not propose real-time still image communications services such as envisioned herein.

[0010] When communicating a scene to another person, a still image can be much more practical and useful than video images. For example, a still image---a picture is---readily named, stored, annotated, and modified. A still image can be precisely discussed, referenced and recorded. High resolution still images can be sent over networks using a bandwidth far too low for comparable video resolution. Furthermore, still image display systems can be less costly and less complicated than video display systems.

[0011] Vision is our broadband sense. We see and take in a scene in an instant, and from that scene the mind rapidly identifies objects and forms associations. It would be useful if a system could provide real-time visual communication analogous to the telephone, allowing complex understanding to be achieved in a single moment from observation of a scene. It has been said that "a picture is worth a thousand words", but in many instances even a thousand words cannot convey a single picture.

[0012] At the present time there is no practical way to share images and communicate visually in real-time from a distance. Digital cameras and scanners are two widely used devices that capture digital images. However, to view those images and send them to others, the digital still images are routinely transferred into a computer, from which they are printed, processed or transferred to a remote location. The Internet allows people to share still images via e-mail or via downloads from a remote server. To send an image by e-mail, one must capture a picture with a digital camera, transfer the picture file to a computer, attach the file to an e-mail, mail it to the distant party, and wait for that party to retrieve and open the mail. To share a picture using a remote server interface, a user must first capture a picture with a digital camera, transfer the picture file to a computer, upload the picture from the computer to the server. Then the recipient must log onto the server, access the picture, and download it. These approaches lack the immediacy, naturalness, symmetry and real-time interactive nature of a telephone call.

SUMMARY OF THE INVENTION

[0013] A real-time picture communications system is described herein that is easy of use, technically sound, compatible with today's technologies, and likely to survive the test of time. A picture communications network subsystem is described that provides real-time picture communication services between users, devices, and/or groups of users, devices, and other groups. The picture communications network subsystem comprises one or more protocol communications nodes connected to one or more networks

to provide communication between the network and the picture communications network subsystem. A registry database in the picture communications system includes user information for a plurality of users, including a user name that uniquely identifies each user, access information, and an owner of each user. The registry also includes device information for a plurality of devices, including a device name that uniquely identifies each device, access information, and an owner of each device, and group information for a plurality of groups that provide access rights to users, devices, and other groups, including a group name that uniquely identifies each group, access information, and an owner of each group.

[0014] The picture communications network subsystem includes a control subsystem that processes requests and executes instructions, such as an attach instruction for attaching a user to a device so that said user is associated with a device during the time period while the user is attached to said device. The control subsystem also executes instructions that establish real-time communication services between users, devices, and groups responsive to an authenticated request by a user or a device if allowed by the various access rights of any users, devices and groups involved in the request. The picture communication system for still images described herein can be implemented in a wide variety of forms, including such aspects as: (1) rapid device initialization, (2) alerting the intended recipient of the originating user's wish to share a still image, (3) acknowledgement by the intended recipient of readiness and willingness at that time to receive a still image from the identified originating user, (4) essentially immediate capture of a still image and transfer of that still image to the recipient, and (5) tools enhancing two-way discourse regarding the still image, such as compact representations of picture annotations and modifications providing an efficient way to share ideas relating to a specific still image among the two or more parties.

[0015] In one embodiment, the system enables an originating user (i) to initiate a contact with another user, (ii) to receive an essentially immediate response as to the remote user's device status and willingness to receive an image from said originating user, (iii) to capture and send the image essentially immediately, and (iv) to engage in a useful real-time exchange with the remote user regarding the image; all in a manner consistent with the spontaneous and immediate nature of a telephone call.

[0016] In some embodiments a real-time still image communications service could be made available to users in combination with real-time voice communications. For example, a complete network service offering might combine still image and voice telephone services in a single integrated package. In this example, a user could initiate a combined voice and picture call with a second user, discuss one or more still images, and receive and originate picture annotations.

[0017] In other embodiments, a still image network service might be deployed without voice services. In this case, the user might know two addresses carried by the intended recipient: a still image device address, and a cellular telephone number. With these two addresses, the originating user could establish a multimedia session supporting voice and still images by using two independently-deployed technologies.

[0018] In another embodiment, user names are distinct from device names in the still image network systems. In one such embodiment, a first user may attach to a particular device so that a second user can initiate contact with the first user by addressing the first user and employing network services to automatically recognize the association between the first user and device to which he is attached, and direct the contact to that device.

BRIEF DESCRIPTION OF THE DRAWINGS

[0019] For a more complete understanding of this invention, reference is now made to the following detailed description of the embodiments as illustrated in the accompanying drawing, wherein:

[0020] **FIG. 1** is a conceptual diagram of a system that provides still picture and other real-time network communication services between a first user who is using a first device and a second user who is using a second device.

[0021] **FIG. 2** is a block diagram illustrating interconnections between users, devices, network interfaces, a network, and a picture communications network subsystem;

[0022] **FIG. 3** is a block diagram of the communication system of **FIG. 2**, illustrating a real-time communication session set up between two users;

[0023] **FIG. 4** is a block diagram of the communication system of **FIG. 2**, illustrating a real-time communication session set up between a user and a device;

[0024] **FIG. 5** is a flowchart illustrating steps to establish a real-time picture communication session between a sender and a recipient;

[0025] **FIG. 6** is a flowchart illustrating steps to establish a real-time communication session between a user and a remotely-positioned camera, and acquire a remote digital image from the remotely-positioned camera;

[0026] **FIG. 7** is a diagram of a picture communication system, including devices, network interface examples, network examples including the internet, connected to a picture communications network subsystem;

[0027] **FIG. 8** is a diagram of information in a registry, organized by user, device, and group;

[0028] **FIG. 9** is a diagram of tiered groups, illustrating access rights;

[0029] **FIG. 10** is a block diagram of a camera for sending picture files;

[0030] **FIG. 11** is a block diagram of a viewer for receiving and displaying picture files;

[0031] **FIG. 12** is a diagram illustrating a process of sending a picture file from a user's camera to a selected viewer in one embodiment;

[0032] **FIG. 13** is a diagram illustrating the process of requesting a picture file from a selected camera in one embodiment, from a set of all immediately reachable cameras,

[0033] **FIG. 14** is a diagram of an arrangement wherein a first user puts a picture file to a second user;

[0034] **FIG. 15** is a diagram of an arrangement wherein a first user gets a picture file from a second user;

[0035] **FIG. 16** is a diagram of an arrangement wherein a first user puts a picture file to a second user through a group filter;

[0036] **FIG. 17** is a diagram of an arrangement wherein a first user gets a picture file from a second user through a group filter;

[0037] **FIG. 18** is a diagram of an arrangement wherein a first user requests a picture file from a device through a group filter affiliated with a second user, and as a result the first user gets a picture file from the second user who is affiliated with a second group filter;

[0038] **FIG. 19** is a diagram of an arrangement wherein a first user puts a first picture file from a device through a group exploder filter to multiple users, and at least one of the multiple users modifies the first picture file and puts it through a group filter to the first user; and

[0039] **FIG. 20** is a schematic diagram illustrating a picture-file answering machine that may act as a surrogate for a viewer during periods when the viewer is available for a session.

DETAILED DESCRIPTION

Introduction

[0040] Future multimedia network plans invariably refer to voice, data and video service offerings. Targeted customers are presumed to want to browse the Web and view full motion video images from afar. In contrast to video communication services, the picture communications system disclosed herein provides a new class of still image visual communications services. Still images can be very useful, often far more useful than streaming full motion video. Still picture communications services enable usage models substantially different from existing and planned services. The following example scenarios illustrate situations in which still picture communication can be useful:

[0041] Scenario 1: A shopper calls home to ask "Which item do we need? This big one or this other one?" The shopper takes a picture of each item, and after a quick glance at the labels on the items, the answer is clear to the viewer at home-and not the answer that would have resulted from a verbal description.

[0042] Scenario 2: An inspector calls the office from the field, sends a picture of a nonstandard implementation to his supervisor and asks: "This looks different.

[0043] What do you think?" The supervisor immediately approves the alternative implementation based on remote inspection of the picture, and records the deviation in the permanent record.

[0044] Scenario 3: From across town, Mom calls up a real-time image of the children's playroom and is immediately assured that they are safe and secure, although awake.

[0045] As can be seen from these and other examples, still images offer distinct advantages over video and verbal communication, for example: (1) precision, because a still image enables two or more parties to review an identical specific picture, (2) simple referencing and archiving, because still images are readily indexed and stored, (3) higher available resolution of still images than video under typical constraints, and (4) economy, requiring only modest bandwidth and a relatively short time period to transmit a still image.

[0046] Described herein is an effective and practical picture communications system that is easy to use, technically sound, compatible with today's technologies, and likely to survive the test of time.

System Overview

[0047] A system and method for communicating a still picture ("image") over networks is disclosed herein. This invention is described in the following description with reference to the Figures, in which like numbers represent the same or similar elements.

[0048] **FIG. 1** is a conceptual diagram of a system that provides still picture and other real-time communication services for a session between a first user **11** using a first device **12** and a second user **13** using a second device **14**, which is connected with the first device **12** using a communication network **15**. In addition to still picture communication services, the system shown in **FIG. 1** can also optionally provide other real-time communication services including voice communication, text communications, picture annotation services, and documents that are viewed simultaneously by both users by using their respective devices, and can be edited in real-time. Either the first user or the second user can initiate any of the communication sessions, and either can send and receive the still picture communication. In some implementations, the second user may be absent, in other words the first user may connect directly to the second device to request information without requiring immediate attention from the second user.

[0049] A user is a person or other operator who communicates with another user or device. A device is an apparatus capable of exchanging picture files with another device substantially in real time. A session is an association between two communicating end points for a period of time. A real-time communications system is a combination of a picture communications network subsystem and one or more networks, described with reference to **FIG. 2** for example.

[0050] **FIG. 2** is a block diagram of a plurality of users **21***a*, **21***b*, and **21***d*, devices **22***a*, **22***b*, **22***c* and **22***d* and network interfaces **23***a*, **23***b*, **23***c*, and **23***d* connected to a network **24**. The network **24** may comprise a single network or a network of interconnected networks. In a simple example, the network **24** may consist of one or more devices directly attached to a picture communications network subsystem. In a more complex example, the network **24** may comprise a GSM network providing a General Packet Radio Service (GPRS) utilizing a GSM handset as the network interface **23***a* connecting through the public Internet to a cable television network utilizing a cable modem as network interface **23***c* that complies with the Data over Cable Service Interface Specification (DOCSIS™).

[0051] A network interface is a component or mechanism by which a device connects to a network. In a simple case, a network interface may consist of a serial port. In a more

complex example, a network interface may comprise a combination of a Bluetooth™ wireless link to a GSM handset employing GPRS packet technology over a GSM network. In many instances, a user interacts directly with a device in order to communicate; for example, a first user **21***a* may interact directly with a device **22***a*, which utilizes a network interface **23***a* to connect with, and communicate over the network **24**. However, as will be discussed with reference to **FIG. 4**, for example, in some instances a user is not necessary to operate the device, for example if the device is a remote camera that serves only to take pictures, an actual user is unnecessary except to set up the device. This is illustrated in **FIG. 2** by a second device **22***b*, operating independently from any user, that utilizes a network interface **22***c* to connect with, and communicate over the network **24**.

[0052] A picture communication network subsystem **26** is connected to the network to provide communication services that facilitate communication between the various users and/or devices. These services include a wide range of services, such as locating users on the network in response to a query, establishing communication services that allow two or more users to communicate in real-time, and support services. In order to provide these services, the picture communications network subsystem **26** includes one or more protocol communication nodes (termed herein "servers") **27**, a registry **28** that includes information about the users, devices, and groups, and a control system **29**. The control subsystem processes requests and executes instructions, such as an attach instruction for attaching a user to a device so that said user is associated with a device during the time period while the user is attached to said device. The control subsystem also executes instructions that establish real-time communication services between users, devices, and groups responsive to an authenticated request by a user or a device if allowed by the various access rights of any users, devices and groups involved in the request. A registry is a database that stores and processes information regarding users, devices, and groups of users and/or devices. One example of a registry is described with reference to **FIG. 8**. Briefly, to keep track of devices and facilitate communication between the various devices connected to the network, the registry may include information such as the device name, owner, description, capabilities, and current network address. Using this information, the picture communications network subsystem **26** communicates with and otherwise facilitates communication between the devices. For example, to establish a real-time communication session between two or more users, the picture communications network subsystem **26** locates all users who are to participate in the session and sets up and establishes the services necessary to allow the users to communicate. Once the services have been established, the users may then communicate in real-time using these services directly without further intervention from the picture communications subsystem.

[0053] A picture communications network subsystem contains one or more registries. The picture communications network subsystem server **27** (**FIG. 2**) is a protocol processing communications node that provides picture communications transport services to devices and users, including for example relaying of queries to the registry, relaying of responses from the registry, and redirection of picture communications between users. The picture communications network subsystem, including registry and server functions, may be implemented within a single computer. Alternatively, registry and server functions, as well as other functions of the picture communications network subsystem may be implemented in different computers and even in different locations.

[0054] **FIG. 3** is a block diagram of the communication system of **FIG. 2**, illustrating a real-time communication session **31** that has been set up between the first user **21***a* and the fourth user **21***d* by the picture communications subsystem. Conceptually, since the session **31** has been established, the session is now directly between the first and fourth users; i.e., the underlying devices and services become transparent to the users. However, in actuality, the physical signals exchanged between the two users **21***a* and **21***d* follow a path through device **22***a*, the network interface(s) **23***a*, the network **24**, the network interface(s) **23***d*, and device **22***d*.

[0055] **FIG. 4** is a block diagram of the communication system of **FIG. 2**, illustrating a real-time communication session **40** that has been set up by the picture communications subsystem between the first device **21***b* attached to the first user **21***a* and the second device **22***b*. Conceptually, since the session **40** has been established, the session is now directly between the first user **21***a* and the second interface device **22***b*; i.e., the underlying devices and services become transparent. However, in actuality, the physical signals follow a path from device **22***a*, through the network interface(s) **23***a*, through the network **24**, through network interface(s) **23***b*, and then to device **22***b*.

[0056] Using the system described herein, a wide variety of communication sessions can be established and utilized for real-time communication. **FIGS. 5 and 6** are flow charts illustrating two examples of such communication sessions; many other examples are possible.

[0057] As in any fully formed real-time communication network, many possible functions are possible, which are made up of a series of operations. **FIGS. 5 and 6** show examples of two such functions. **FIG. 5** is a flow chart of operations to set up and establish real-time communications between two users, identified as a sender and a recipient. Operations to send a digital image from the sender to the recipient begin at box **41**, and at **42**, the sender selects one or more recipient users and/or viewers. At box **43**, the sender connects to the picture communications network subsystem **26**. At box **44**, the picture communications network subsystem locates the recipient viewer and sends an alert notifying the recipient that the sender wants to establish a communication session. At decision box **45**, if the recipient viewer acknowledges, then operation moves to box **46** in which the picture communications network subsystem establishes a communication session between the sender and the recipient. At box **47** the sender captures a digital image. Alternatively the sender can choose to send a previously saved digital image. Then at box **48** the sender transmits the digital image to the recipient over the open communication session. At box **49**, the recipient user views the image on the viewer device. After this, the sender and recipient can engage in other communications over the real-time session; for example, the sender and recipient may converse using telephone-like services, and/or the recipient may annotate the image using a keypad or a tablet to create a picture

modification file, and return the picture modification file to the sender for review and discussion.

[0058] Still referring to FIG. 5, if from the box 45 the recipient does not acknowledge the alert from the server, or if a communication session cannot be established, then operation moves to box 51 in which the picture communications network subsystem 26 determines if a forwarding address has been predetermined by the recipient. If there is no forwarding address, then operation moves to the box 52, and the sender is informed that the recipient is not responding. However, if there is a forwarding address, then operation moves to box 53, in which the picture communications system server sets up a session with that forwarding address, and the sender can capture a digital image, and save it to the address predetermined by the recipient. In addition, the sender may also save other information to the device at the forwarding address, such as a voice message. Alternatively, a forwarding address predetermined by recipient may direct the query to another device or user, in which case the process is re-entered at step 44 where the picture communications network subsystem 26 sends an alert to the predetermined alternate viewer/user address.

[0059] FIG. 6 is a flow chart of operations to set up and establish real-time communications between a user and a device, identified as a remotely-positioned camera, for the purposes of acquiring a real-time digital image. Operations to acquire a digital image from a remotely-positioned camera begin at box 58, and at 59, the user connects to the picture communications network subsystem 26. At box 60, the user selects a remotely-positioned camera. At box 61, if desired, the user selects camera parameters. At box 62, the picture communications system locates the selected camera and attempts to establish a real-time communication session between the user and the camera. At decision box 63, if the camera is found and a communication session is established, then operation moves to box 64 in which the user sends a request for the remote camera device to capture and send a digital image over the real-time communication session. At box 65 the camera captures a digital image, and then at box 66 the digital image is transmitted to the user over the open communication session. At 67, the user views the image. After this, the user can request additional images from the camera and/or request additional information, such as sound if the camera includes a microphone. However, if at box 63 the camera is not found or the communication session cannot be established or if the user does not have access rights to the camera device according to Registry records associated with the camera device, the user is informed that the selected camera is not available.

[0060] FIG. 7 is a diagram of a picture communications network, showing examples of user interface devices, network interface devices, and networks, connected via an Internet 70 to the picture communications network subsystem 26, which supervises and facilitates communication between the devices connected thereto. The Internet 70 is a widely used, world-wide electronic communication network, and provides a suitable network from which to implement the picture communications system, and connect to the network subsystem 26. In other embodiments, the network subsystem 26 can be connected directly to other networks, in addition to, or in place of the Internet.

[0061] In the examples shown in FIG. 7, the user devices include a camera 71, a viewer 72, and a combination viewer-camera 73. The camera 71 may comprise a suitable digital camera that may also capture an image in a selected digital format and save it in a memory card within the camera. The camera 71 may include a system for communicating the digital image at the same time as the images is captured, and it may include a system for communicating the digital image before the image is saved on the memory card, thereby allowing real-time communication. The viewer 72 comprises any suitable viewing media, such as an LCD screen that can display an image substantially when received for real-time communication. The combined camera-viewer 73 comprises a combination of both the camera and viewer 72. Any of the user interface devices 71, 72, and 73 may also include, in the same package, one or more network interfaces.

[0062] A first network interface example shown in FIG. 7, the viewer 72 is connected to an Ethernet adapter 74, which is connected to a cable modem 75, which is connected a cable television head end and gateway 76, which is in turn connected to the Internet 70. In a second network interface example, the camera 71 is connected to a Bluetooth® adapter 77, a Bluetooth™ node host 78, and a Local Area Network (LAN) 79, which is connected to the Internet 70. In this example, a firewall 80 is situated between the LAN 79 and the Internet 70 in order to provide security to the LAN. In a third network interface example, the viewer/camera 73 is connected to a Bluetooth™ wireless adapter 77, a digital PCS handset 81 with a Bluetooth® wireless adapter that transmits over a wireless wide area network such as a digital PCS network 82 utilizing GSM or CDMA technology, and then to a data services gateway 84 that connects to the Internet 70.

[0063] FIG. 8 is a diagram of the fields in one example of the registry 28. As discussed briefly with reference to FIG. 2, the registry stores information on users, devices, and groups. The registry information for one embodiment is illustrated in FIG. 8; other embodiments may contain different or additional information as appropriate to meet the desired purposes.

[0064] The registry shown in FIG. 8 includes three sets of records: user information shown at 86, device information shown at 87, and group information shown at 88. In addition, subscriber information is shown at 89. The database structure may vary between embodiments, considerations such as scalability, security, subscriber service, fraud mitigation, and other factors can lead to structural variations. For example, the user information for each user may be stored with a user record, the device information for each device may be stored in a device record, and the group information for each group may be stored in a group record.

[0065] User information 86 includes a user name that is unique within the namespace utilized by the registry. Additional user information stored within the registry includes information necessary to authenticate the user (e.g. a password), access information such as a list of other users and devices with rights to access that user, the identity of a device to which the user is attached, and the owner, who has the right to change and update user information. In some embodiments, the authentication information comprises a secure authentication algorithm and necessary keywords which may, for example, be similar to that used by a GSM network to authenticate a GSM subscriber identity module

(SIM). The owner of a user may be that user; that is, the person who is the user may also serve the function of owner of that user identity within the registry. Additional information about the owner may be stored in the form of subscriber information **89**, which may include information such as billing information, address, phone number, and so forth. Optionally other information about the user may be included in the registry, such as informal ID (e.g. handle) and usage history.

[0066] Device information **87** includes a device name that is unique within the namespace utilized by the registry. Additional device information stored within the registry includes (i) information necessary to authenticate the device (e.g. a secure authentication algorithm and necessary keywords which may, for example, be similar to that used by a GSM network to authenticate a GSM international mobile equipment identifier (IMEI).), (ii) access information such as a list of other devices and users with rights to access that user, (iii) the (dynamic) network address of the device, (iv) the owner, who has the right to change and update device information, and (v) class (e.g. camera, viewer). Additional information about the owner may be stored in the form of subscriber information **89**. Optionally other information about the device may be included in the registry, such as device description, alternate addresses for forwarding requests, and so forth. In one embodiment a large amount of flexibility is provided in defining the access rights; particularly the access information regarding a device may identify (i) groups associated with that device, (ii) users and devices which may send picture files to and receive picture files from that device, and (iii) users who may establish control of (attach to) that device. Also, a device may be named in a recipient list of a group, so that any picture file sent to that named group will be sent to that particular viewer device as well as all other devices associated with that group.

[0067] A group is a set of users, devices, and other groups. Group information **88** includes a group name that is unique within the namespace utilized by the registry, recipient information such as a list of devices, users and other groups who may receive information from access requests directed to that particular group; access information such as a list of devices, users, and other groups with rights to access members of the recipient list as a group. Additional group information stored within the registry includes information necessary to authenticate the owner (e.g. a password, or alternative secure authentication algorithm and keywords), and the owner, who has the right to change and update group information. Additional information about the owner may be stored in the form of subscriber information **89**. Optionally other information about the group may be included in the registry, such as type, and so forth. In one embodiment a large amount of flexibility is provided in defining the access rights; particularly the access information regarding a group may identify (i) other groups whose access list members may access that group as if listed individually with access rights, and (ii) users and devices that may send picture files to members of the recipient list of that group by the single action of sending a picture file to said group, and (iii) users and devices that may request picture files from all members of the recipient list of that group by the single action of sending said request to said group. As an example of the first case (i), a particular viewer device may be listed on the recipient list of a particular group, so that any picture file sent to that named group will be sent to that particular viewer device as well as all other devices named on the recipient list of that group.

[0068] One special type of group is called a public group. Except in the case when usage restrictions do not allow, any device attached to a public network is granted access privileges to other devices that are members of the public group.

[0069] A device, such as described with reference to **FIGS. 10 and 11**, can attach to a network and execute a picture communications system protocol for the purposes of communicating with a registry and communicating picture files with other devices. A device may be a viewer, a camera, or a combination of viewer and camera. A user may become attached with a device within the registry, which sets up a session between the user and the device. If the registry knows to location of a device and also knows the user to which the device is attached, then the registry can use that device to set up a communication session with that user. A user becomes attached with a device by an attach process to be described, and a user becomes de-attached from a device by a detach process.

[0070] Subject to restrictions imposed by the operator of a picture communications system (such as establishing credit worthiness as a subscriber), any entity may register to become a user on the registry using any suitable system, such as a Web interface or direct telephonic communication; the entity that registers a user becomes an initial owner of that user. Likewise, any user may register a device, and that user becomes the owner of that device. Devices can be registered on a registry via a network by interaction between picture communications client application software running in the device and picture communications server application software running on the registry host; an owner must complete the registration using information to authenticate device ownership. Device associations and rights are set by the owner of the device.

[0071] In general, an owner is allowed to modify the registry record of the owned entity. Particularly, the registry record of every device identifies an owner of that device, the registry record of every user identifies an owner of that user, and the registry record of every group identifies an owner of that group. An owner may be a user and an owner may be a group. The owner of a user record in the registry may be that user. Alternatively, the owner of a user record in the registry may be a different registered user, and the owner of a user record in the registry may be a group. For example, an owner of a device may identify groups and users allowed to access that device. An owner of a group may change the names on the access list and the recipient list of the group. A current owner of an element (whether user, device or group) may change the owner name of that element to any other user or group, after which that other user or group becomes the current owner of said element. As another example, each device has an owner, who sets access rights to a device by specifying a list of users, devices, and groups that have access rights to the device. An owner may register a device as a member of a group, so that a user of the device may send picture files to the group and may receive picture files from the group. An owner is typically considered the subscriber for the purposes of billing for network and registry services used by a device.

[0072] An owner of a group may allow all or certain users to join a group, which means that such a user causes that

user's name to be included in the recipient list of that group. An owner of a group may specify that certain users may join by naming groups as optional recipients. This technique enables what may be termed "opt-in" group membership.

[0073] A user may be added to the recipient list of a group as a result of an action by the owner of that group and an action by the owner of that user; where the action of one party places the user name on the optional recipient list, and the action by the remaining party causes the name to move from the optional recipient list to the recipient list. The owner of that group may indirectly add a user by including on the optional recipient list a group in which that user is on the recipient list.

[0074] In groups, circular ownership is not allowed in some embodiments. For example, If group A is the owner of group B then group B may not be the owner of group A, and if user A is the owner of group B then group B may not be the owner of user A, and if user A is the owner of user B then user B may not be the owner of user A. Similarly, indirect circular ownership is not allowed. For example if user A is the owner of user B which is the owner of user C then user C may not be the owner of user A, and so forth.

Access and Attachment

[0075] Access refers to the right to connect to a user or a device over a network for the purpose of establishing a real-time communication session, and possibly exchanging a picture file. For example, if user A has access rights to device B, then user A can connect to device B. In this example, if device B is a viewer then user A has the right to connect to device B for the purpose of sending a picture file to device B. Access rights to each device are identified in the registry for every device and access rights for each user are also identified in the registry. Device access rights include the right of a user to access that device and the right of a member of a group to access that device. Device access rights are set by the owner of that device.

[0076] Access rights are identified in the registry for every device and for every user. Device access rights include the right of a user to access that device and the right of a member of a group to access that device. Similarly, user access rights include the right of a different user to access that user and the right of a member of a group to access that user.

[0077] Attaching to a device refers to the process of establishing control over that device. Every device includes an attach list that identifies users who may (and groups whose access list members may) attach to that device. Device attach rights are set by the owner of that device.

[0078] A user may attach to a device for a period of time, during which time the access rights pertaining to that user are attached to that device. For example, a user may gain physical control of a viewer device and then initiate an attach process including authenticating the user to the registry by means of a communications element within the viewer device. If successful, the user becomes attached to the device and remains attached until the user is detached from the device. A detach operation may be invoked by the user, by the device or by the registry, for example. A detach operation may be initiated any one of several events, such as (a) express release invoked by the user, (b) expiration of a timer within the viewer device, (c) expiration of a timer within the registry, (d) receipt by the registry of a detach command from the owner of the device, (e) failure of the device to successfully re-authenticate the user upon request by registry, and (f) failure of the user to successfully re-authenticate upon request by the device.

[0079] **FIG. 9** is a diagram illustrating access rights of one type of group-a tiered group. These tiered groups provide a useful example of device attach rights pertaining to users and groups. In example shown in **FIG. 9**, six users U1, U2, U3, U4, U5 and U6) and seven devices D1, D2, D3, D4, D5, D6 and D7) are registered as members of tiered groups T1, T2(1), T2(2) and T3. Assume user U1 may attach to device D7. While U1 is attached to D7, an attempt by a different user to send a picture file to user U1 will result in an alert on device D7, and an attempt by a remote user to send a picture file to user U2 will not. A picture file sent to group T1 will arrive at device D7 while D7 is attached to user U1 and while detached.

[0080] Continuing the example in **FIG. 9**, it can be seen that user U2 is a member of groups T1, T2(1) and T3, while device D3 is a member of group T3. User U2 may attach to viewer device D3. While U2 is attached to D3, D3 receives picture files directed to user U2, group T1, group T2(1), group T3, and device D3 but does not receive picture files directed to group T2(2). When detached, the viewer device D3 receives only those picture files directed to group T3 and to viewer device D3.

[0081] A user may attach to a device associated with a public group by using the device to inform the registry that the user is controlling the device. During the period while the user is attached to the device, the rights and group memberships associated with the user are attached to the device as well as the user.

[0082] For example, user K may approach a viewer that is publicly accessible. User K invokes a login procedure during which the user authenticates identity and asserts control over the device, and initiates picture communications with user L who is currently attached to another registered device. While user K remains attached, user M attempts to access user K resulting in user K receiving an alert and deciding to accept a picture file from user M. Depending upon the capabilities of the viewer device to which user K is attached, user K may then continue to interact with both user L and M while remaining attached to the viewer device.

[0083] Exchange of a picture file between users is accomplished by reference to attach status within the user record of the registry. Consider an example, in which user A is attached to camera device B and initiates a request to deliver a picture file to user C. The registry finds user C is attached to viewer D and that user A has access rights to user C. Registry routes a request to viewer D which alerts user C of the request from user A. User C accepts the request directly to user A, together with the address information for device D to which user A then sends the picture file from device B.

[0084] In this example, when user B accepted the alert from user A, user B exercised the option of addressing user A directly and inviting user A to send the picture file directly to user B. Alternatively, user B could accept the alert from user A by way of the registry with an indication that user B wishes the registry to utilize an anonymizing relay service of a protocol communications node (i.e. server). In this alter-

native, the server relays the acceptance from user B to user A and provides user A with the address of the server for the picture. User A sends the picture file to the server for relay to user B.

Device Implementations

[0085] Devices may be implemented in any of a wide variety of apparatus, including cameras that may be used to create and communicate picture files, viewers that may be used to view and communicate picture files. A device may connect to a network, possibly through one or more intermediate elements, for the purpose of communicating picture files. A single device may include the functions of a camera and a viewer.

[0086] A camera is a device such as discussed with reference to **FIG. 10** that includes an image capture subsystem and a communications subsystem suitable for communicating with a picture communications network subsystem utilizing a prearranged protocol. A camera may optionally include storage, a microphone, a display, a touch screen, a keypad, a flash unit and other elements.

[0087] A viewer is a device such as discussed with reference to **FIG. 11** that includes a display and a communications subsystem suitable for communicating with a picture communications network subsystem utilizing a prearranged protocol. A viewer may optionally include storage, a keypad, a keyboard, a touch screen, a speaker, a microphone, and other elements. For example, one embodiment may include a viewer, a camera, a keypad and a telephone, which could be useful for communicating with another user who has a similar device. Another embodiment may include only a camera and a microphone, which can be useful for remote-image capturing. A wide variety of configurations using various combinations of user interface devices for realtime communication are made possible by the communication system described herein.

[0088] **FIG. 10** is a block diagram of an example of a camera, illustrating functional blocks including a device controller **101** that receives instructions from a user interface **102** that comprises, for example, a shutter button, a mode selection wheel, and a series of menus and submenus. The device controller **101** is also connected to an image capture subsystem **103**, including lens optics and sensors, for example, that are used to capture an image. An image processor **104** is coupled to receive the image from the image capture subsystem **103**, subject to control from the device controller **101**. A picture file protocol processor **105** is coupled to receive the image from the image processor **104**, subject to control from the device controller **101**, and process the image data to provide a picture file in a format predetermined by a suitable standard. A network interface **106** is coupled to the picture file protocol processor **105** and the device controller **101** to provide an interface to provide communications functions with the network **24** to transmit the picture file. In this example, the network interface **106** is integrated within the camera; in alternative embodiments the network interface **106** is situated externally. The network interface **106** includes, for example, a protocol processor and a physical interface such as a cable connection (e.g. an Ethernet 10-base-T connector or a wireless interface.

[0089] **FIG. 11** is a block diagram of an example of a viewer for viewing picture files, showing functional blocks including a device controller **111** that receives instructions and information from a user interface **112** and a network interface **113** coupled thereto. Communications functions between the viewer and the network **24** are provided by the network interface **113**, which includes, for example, a protocol processor and a physical interface such as a cable connection (e.g. an Ethernet connector or a wireless interface. In this example, the network interface **113** is integrated into the viewer; in alternative embodiments the network interface **113** is situated externally. A picture file protocol processor **114** is coupled to receive a picture file in predetermined format from the network interface **113**. The protocol processor **114** processes the picture file into a form suitable to be processed by an image processor **115**. A display **116**, such as an LCD screen, is coupled to display the image data received from the image processor **115**.

[0090] In some embodiments, the camera and viewer could be combined in a single integrated package; in such embodiments, some of the functional blocks can be shared and integrated into a single block, for example a single image processor can perform the image processing functions for both the camera and the viewer, a single picture file protocol processor can provide picture file processing functions for both the camera and the viewer, and a single network interface device can provide communication functions for both the camera and the viewer. As discussed previously, a number of other devices, such as a telephone, microphone, keypad, and so forth, can also be integrated in a single package, and it should be apparent that some functional blocks can be shared, such as the network interface device block, depending upon the configuration of any particular embodiment.

SYSTEM DESCRIPTION

System Design Considerations and Requirements

[0091] A picture communications system can create a new class of communications services, offering the visual equivalent of a telephone call. For example, picture communications services can enable a user to contact a remote user and deliver a freshly captured picture to that party when the call is accepted. Picture communications services can also allow a user to capture a fresh picture from a remote camera selected from a directory.

[0092] In one embodiment, natural, intuitive picture communications implemented by adding key elements to existing network infrastructure, and implementing certain functions within relevant user devices. In what follows, the underlying design considerations are described, then a framework for a solution is described, and then the elements of that solution are described.

[0093] To design an effective, practical picture communications system, the following design factors should be considered. It should be apparent that in any real-world embodiment, there will be trade-offs between the various design considerations, which will be resolved by the scaled importance of each consideration:

[0094] Simple. From the perspective of the user, devices and services should be self-evident, recognizable, easy to use, readily understood, and intuitive to be adopted and used by the broad population.

[0095] Universal. Services should be widely accessible using existing networking infrastructure.

[0096] Standard. Devices and services should interact using a protocol which defines commands, procedures, and file structures in sufficient detail to ensure interoperability.

[0097] Real time. Response times should be sufficiently short to ensure that the user experience is substantially immediate.

[0098] Interactive. Users should be able to mark, annotate and otherwise manipulate a specific shared image while maintaining synchronized views of that image.

[0099] Secure. Users should be confident that an image is transferred securely, free from unlawful interception.

[0100] Addressable. Devices should be individually addressable in a consistent and stable manner.

[0101] Discoverable. A public registry is required so that device addresses can be located and basic characteristics of a device can be determined.

[0102] Accountable. Mechanisms should enable accounting for device and network services usage, in a manner that allows flexible business arrangements to be accommodated.

[0103] Forward compatible. Evolution of protocols, devices capabilities and network services is inevitable and should be considered in system planning.

[0104] Each of these features or characteristics is addressed in a following section.

Simplicity

[0105] Sharing and discussing a picture is a natural act. A picture communications system should not intrude on that natural activity. Devices and system use should be virtually obvious to the end user, so that a typical consumer can use basic functions without detailed instructions.

[0106] Simplicity applies to using picture communications; to initiating a session during which pictures may be shared, manipulated and discussed; and to initiating service for a new device. A simple, automatic device registration method is envisioned whereby a device can join the picture communications system with default parameters, and the owner can modify the registration through the Web to set the desired characteristics for the device. A simple method is envisioned whereby a user of one device may initiate contact with another device and thereby alert a user at that other device, allowing that user at another device to accept the contact and engage a session between the two devices, and then to efficiently exchange, manipulate and discuss pictures.

[0107] Simplicity also extends to service parameters, in which the range of technical options are tightly constrained to ensure that all devices interoperate without coordination. The public switched telephone network (PSTN) shares this characteristic, in that voice telephone calls are constrained to a passband of approximately 300 Hz to 3000 Hz, and the signal is mu-law companded and waveform encoded at 64 kbps, resulting in limited fidelity but maximum interoperability.

Universal

[0108] Today's networks allow a consumer to purchase a telephone, order a telephone line from the local telephone service provider, plug in the telephone and place a call to another party already on the network, without making special arrangements with the called party.

[0109] Similarly, if a consumer purchases a computer with Internet browser preinstalled, and arranges Internet access through an Internet Service Provider (ISP), the consumer can reach a broad array of Web-based information services without making arrangements with the Web site owners.

[0110] A picture communications system should make use of existing networks so that a new device owner does not need to make special arrangements with another party to share pictures with that party. A picture communications system should allow a consumer to acquire a device, connect to an existing network, register transparently, and use the device to share a picture with a remote device without technical assistance.

Standards and Specifications

[0111] A picture communications system specification should define a system architecture, file structures, commands, procedures and protocols for communicating between devices and other system elements. Picture communications system test specifications should define test cases so that devices and system elements may be certified for compliance with picture communications system specifications to ensure interoperability.

[0112] According to the Open System Interconnection (OSI) reference model, as presented in ISO 7498 and CCITT X.200, network services and protocols can be described within a seven-layer framework in which each layer provides services to the layer above. From top to down, the layers include (1) application layer, (2) presentation layer, (3) session layer, (4) transport layer, (5) network layer, (6) data session layer, and (7) physical layer. Concepts applicable to picture communications system standards are considered in what follows on a layer-by-layer basis.

[0113] A typical picture call might involve a viewer and remote camera as follows:

[0114] A viewer implemented as a picture-call specific client application using a presentation layer optimized for a real-time picture call,

[0115] A session between the viewer application and a remote camera (running it's own layered implementation), employing

[0116] Picture-call specific transport layer services, running over

[0117] Standard Internet Protocol (IP) network layer services, connected to the Internet via point-to-point protocol (PPP) data session layer, over an

[0118] Ethernet physical layer.

[0119] At the other end of the picture call, a remote camera might contain a camera application running over a camera-specific presentation layer with integrated session and transport layer services, connected via Bluetooth wireless technology to a nearby network access point, which uses Internet network layer services to connect the camera to a picture communications system server.

[0120] This brief introduction highlights only a few aspects of the necessary specifications. Among the other aspects are device and owner registration, name resolution, security, and user interface constraints.

[0121] Physical and data session layer. Various existing physical layer and data session layer protocols may be employed for network access. For example, Bluetooth™ wireless technology allows a camera or a viewer to attach to a wide area network through access points and gateway devices.

[0122] Network layer. The most widely used network layer protocol is Internet Protocol (IP). Although the picture communications system concepts apply equally well to other networks, an early implementation may connect server and registry functions to the Internet via IP.

[0123] Transport, session and presentation layers. The transport, session and presentation layers provide end-to-end communications services to the application layer.

[0124] Throughout this document, various services are described, which involve exchanges between devices, between devices and the registry, and between devices and the protocol communications node (i.e. server). Proper functioning of those services in any particular embodiment requires that the exchanges be implemented consistently in all devices. This consistent implementation may be accomplished in part through a picture communications system protocol specification addressing transport, session and presentation layers exchanges and services in detail; and addressing the application layer with regard to such elements as picture file, message structures, and basis user interface guidelines.

Real Time

[0125] Response times should be sufficiently short to ensure that the user experience is substantially immediate. Users should be able to actively share and discuss pictures without being distracted by noticeable delays.

[0126] A substantially immediate process enables an originator to alert the selected recipient, and (if accepted or acknowledged by the recipient) then captures and sends the picture to the recipient. In this two-party example, after the initial picture is delivered to the recipient, the recipient might create and return a picture modification file by using built-in, standardized tools for manipulating and annotating pictures.

Interactive

[0127] A picture communications system may support a session during which one or more users may share pictures and picture modification files among themselves. Users should be able to mark, annotate and otherwise manipulate a specific shared image while maintaining views of that image that are synchronized and identical for all users.

[0128] A picture communications system may include obtaining a fresh image from a remote camera, sending a fresh image from the user's camera to a remote viewer, and sharing a viewed image with a remote viewer. A picture communications system can also include real-time discussion of an image. To facilitate such discussion, tools may be implemented to enable a user to mark the image by placing a pointer, draw attention to an area using an area selection tool, add labels and other notations to the image, crop the image to eliminate unwanted regions, and otherwise manipulate the image, and then to communicate efficiently the resulting modifications to a remote user for discussion. A sequence of modifications may be added to the same image by different users. A set of modifications associated with a particular picture, which result in a specific view, is referred to herein as a picture modification file. Layering is one way of accomplishing this.

Secure

[0129] Users should be confident that an image is transferred securely, free from unlawful interception. One example of a secure system transports an image across the network without regard to content; that is, it transports the image without network translation, conversion or other picture manipulations. Another example of a secure system enables a device to encrypt an image so that only the intended recipient device may decrypt and use the image. Another example of a secure system enables a device to enter a secure session with another device in such a way as to establish confidence that all exchanges remain confidential. Registry-based authentication and protocol design can support these features. One secure system can be designed using concepts taken from GSM handset and subscriber authentication procedures and algorithms, GSM link-level encryption, and the widely-used "pretty good privacy" (PGP) algorithm used to secure electronic mail between many people, as disclosed for example in Internet Engineering Task Force (RFC 2440). In designing a secure system, the protocol designer may balance a number of factors such security level, complexity, network overhead, and latency in designing an optimal security solution.

Addressable

[0130] Devices should be individually addressable in a consistent and stable manner. Each device should be assigned a unique device address. When connected to a network, each device may have a network address that allows remote access.

[0131] A persistent universal resource name (URN) may be associated with each camera and viewer. A world-wide web (WWW) Uniform Resource Locator (URL) is one example of the more general URN. Specific URN assignments may be drawn from a namespace specifically developed for a standardized picture communications system. For example, device naming and addressing may fit within the URN framework evolving within the Internet Engineering Task Force (IETF) (see for example http://www.ietf.org/html.charters/urn-charter.html).

[0132] A picture communications system may enable separate registration and identification of users and devices.

In this example, both the user and the device (for example, a camera or viewer) may each be identified by a unique URN, each associated with a separate record within the registry. For example, a smart card might contain a subscriber identification number (such as the International Subscriber Mobile Identifier, IMSI, used in GSM wireless handsets) which can be read by a camera or by a viewer, and the camera might contain a equipment identification number (such as the International Mobile Equipment Identifier, IMEI, permanently associated with each GSM wireless handset). In this example, when an intended recipient receives an alert from an remote user who wishes to send a picture call, the recipient may be presented with (a) the originating user name, (b) the originating device name, or (c) both, and then use the received names to decide whether to accept the picture call.

Discoverable

[0133] A directory system can be implemented so that devices may be located so that characteristics of a device may be determined. A directory system maintains records of each registered device with information such as the URN, device address, device characteristics, current network address and current status so that authorized remote users may locate and access the device. Internet concepts for distributed domain name server (DNS) system and public telecommunications network standards for intelligent network (IN) number management provide a solid foundation for distributed registry solutions.

Accountable

[0134] Picture communications may involve the using of remote devices and network resources provided by a third party. A system that accounts for usage enables business models to justify deploying devices and networks and to maintain operation for the benefit of the users. Precise, detailed usage records facilitate accurate billing. Accounting mechanisms may collect detailed usage records without burdening devices or network resources unnecessarily and without compromising basic requirements for privacy.

[0135] Accounting mechanisms vary between embodiments; for example one or more of the following business relationships may be provided:

[0136] 1. User pays a monthly (or other periodic) access charge for use of a registered viewing device;

[0137] 2. User pays a periodic access charge for access to devices associated with a group;

[0138] 3. User pays usage charges for access to particular remote devices;

[0139] 4. Device owner pays the network operator based on traffic generated by remote users' usage of the device;

[0140] 5. Group owner pays for group member service usage based on detailed usage reports; and

[0141] 6. Anonymous user prepays for access to certain devices, group or network services.

[0142] By separating the user names and device names, and enabling each to have a separate owner, thereby identifying the user (the owner) separately from the device (e.g., the camera or viewer), business models may include devices which can be used by a user in a manner similar to the pay telephone. For example, a user might approach a publicly accessible viewer, prepay for a picture call, and request a picture from a remote camera.

[0143] To enable a device owner to charge for device usage, a device could generate a Picture Detail Record (PDR), and then deliver that PDR to an accounting collector.

[0144] PDR may be collected for reasons other than settlement of charges for resource usage. For example, a device owner may want a PDR to identify the address of a remote device that accessed the owner's device. A device accessing a remote device that collects PDR could be provided the opportunity to remain anonymous by optingout of usage.

Forward Compatible

[0145] While no system can be designed to be fully future-proof, any new system should provide for enhancements.

IMPLEMENTATION OF PICTURE COMMUNICATIONS SYSTEM

[0146] One embodiment of a picture communications system that enables real-time communication of digitally encoded pictures and associated information is disclosed herein. Picture communication includes the transfer of a digital file referred to herein as a picture file. The picture file is useful to define the various entities involved, as well as to define the image. This section defines terminology for one embodiment, and outlines the services provided by this embodiment of a picture communications system. A comprehensive picture communications system solution is envisioned, enabling a broad population of users to communicate using pictures. The system description covers architecture, primary entities, services, privacy, security, heterogeneous network topologies, mobility, transient network connectivity and other areas.

[0147] The functions of the picture camera, picture viewer and picture communications network server are described. The methods for interacting between the three primary entities (camera, viewer and subsystem) are described. The perspective of the camera user and the viewer user are described so that the device functions and the networking services may be better understood. A method includes accounting data collection so that various business models may be contemplated, personal picture storage devices enabling pictures to be received while a viewer is absent, device initialization and registration, authentication mechanisms, and access permission methods. Picture modification techniques and the interactive sharing thereof are discussed; also, group conferencing mechanisms are discussed.

[0148] The picture communication system envisioned can provide (i) fast communications of still images between distant locations over public as well as private networks; and (ii) intuitive, natural concepts facilitating rapid adoption by broad population.

[0149] FIG. 12 is a diagram illustrating a process of sending a picture file from a user's camera to a selected viewer. A picture communications system can allow an arbitrarily large population of picture cameras and picture

viewers to interconnect without prior coordination. **FIG. 12** shows this concept from the point of view of the camera user. A user of a particular camera captures a picture in a digital image file and communicates that picture to a single viewer selected by the camera user from the set of possible viewers. **FIG. 13** is a diagram illustrating the process of requesting a picture file from a selected camera 1 one embodiment, form a set of all immediately reachable cameras. **FIG. 13** shows the viewer user selecting a particular camera and issuing a command to retrieve a fresh picture, without intervention at the distant camera and without prior coordination with a user at the distant camera.

[0150] Camera and viewer devices may be interconnected through any combination of suitable public and private networks, such as the Internet, private intranets, digital wireless PCS networks, microwave distribution networks, specialized mobile radio networks, and a variety of hybrid networks. Camera and viewer devices may be interconnected by concatenated networks and sessions. For example, a viewer may integrate Bluetooth wireless technology which may be used to access a picture communications system on the Internet through a variety of intermediate networks at different times depending upon which particular network access point is in the vicinity. By such means a user may remain attached to a viewer and move among network access points involving different intervening networks.

[0151] A picture communications system includes camera devices which capture pictures, viewer devices with which a user views a picture, one or more picture communication network subsystems, each of which provides registry and other services, users who have certain privileges and service capabilities, owners who register and configure camera and viewer devices, and other elements.

[0152] A comprehensive service offering can be implemented and is referred to herein as picture file service. A file structure referred to as a Picture file is discussed. A picture file in one embodiment includes a digitally encoded image, information relating to the creation of the image, and optionally user-created text and/or a digitally encoded audio clip.

[0153] One embodiment of Picture service enables a camera user to send (for example using a "Send Picture File" command) a Picture file from a camera to a remote viewer in real time, without prior coordination. Also, the system allows a viewer to get (for example by issuing a "Get Picture file" command) a fresh picture from a camera that is registered and network accessible. That is, a Picture file transfer from camera to viewer may result from a request from either a camera user or a viewer user. A registration process allows the Owner of each camera to set access rights for individual viewers and for groups of viewers

Definitions

[0154] Accept. (verb) The action by a receiving user of accepting a request delivered by an alert message.

[0155] Access. (verb) An action of attempting to connect to a user, device and/or group. (noun) The right to access a particular user, device and/or group of users or devices.

[0156] Access list. (noun) A list attached to a registry user or device record containing a set of user, device and group names along with Boolean connectors. The access list specifies the users, devices or groups that are allowed attempt access to the user or device which is the subject of that particular record. Boolean connectors permit the use of "or", "and" and "not" to specify the combinations and sequence of user, device and group names selected by an owner of a user device, or group.

[0157] Alert. (noun) A message to a receiving user from a registry and caused by an initiating user requesting to connect with the receiving user for the purpose of exchanging one or more picture files. (verb) The action of communicating an alert message.

[0158] Allow. (verb) (a) the process by which a picture communications network subsystem authenticates and enables a request by a requesting user or device to access and/or establish real time communication with a designated user, device, or group; (b) the process by which a picture communications network subsystem authenticates and enables a request by an owner to modify a registry record of an owned entity.

[0159] Attach. (v) A user action by which that user becomes associated with a device for the purposes of using network services.

[0160] Attached. (noun) The state of a user between the time that user successfully attaches to a particular device and the time that user is detached from that device.

[0161] Camera. A device that captures a visual image and communicates the image to another device in a manner compliant with a picture communications system protocol specification.

[0162] Connect. (verb) An action by which two or more users and devices become able to put and get (as defined herein) picture files between one another within the time span of a session. Each user or device may be concurrently connected to one or more users, devices, and groups. While connected, users may put and get one or more picture files between connected devices and between connected users. From a protocol standpoint, devices connect above the transport level; the picture communications system does not rely upon connection-oriented services from the transport or lower layers.

[0163] Device. (n) A named element capable of exchanging picture files with another device and exchanging messages with a registry, all in a manner compliant with a picture communication system protocol specification.

[0164] Get. (verb) An action initiated by a user or viewer device for the purpose of obtaining a picture file from a camera. (noun) A message from a viewer soliciting a picture file from a camera. A get message is a get request.

[0165] Group. A set of users, devices such as cameras and viewers, and/or other groups, with associated connect and access rights and rules. A group is created and maintained within a registry by an owner. A group may serve one or more functions. For example, in one function termed a group exploder, a picture file directed to the group is redirected to all group members listed on the recipient list for that group, in a manner analogous to an electronic mail exploder. In this example the registry entry for the group includes a list of recipients to whom requests to put a picture file directed to the group will be directed, in addition to an access list of users, devices and groups whose members may access the recipients as a group. In another function termed a group

filter, a group name is included in the access list of an entity (user, device or other group member) so that the access list of the entity effectively includes the access list of that group.

[0166] If the access list of a particular user is limited to one group, then only requests from sources named on the access list in that group may reach that particular user. A special case of this group filter function places the group name as the sole entry in the access list of each listed user or device; the effect of this is to create a closed user group in which the members may receive requests (for example, to put or get picture files) from other members exclusively.

[0167] Join. (n) An action by which a user may enter the recipient list of a group based upon being included among the optional recipient list.

[0168] Name. (n) An identifying word unique within the namespace of a particular registry and assigned to an element as a label for the purpose of addressing that element.

[0169] Named. (adj) An element with an assigned name.

[0170] Owner. Every device and user listed within a picture communications network subsystem registry is associated with an owner. An owner may be an individual registered user and an owner may be a registered group. The owner of a registered device, such as a camera or a viewer, has authority to define capabilities associated with that device, set access rights for that device camera (viewer), and set configurable parameters on that camera or viewer. For example, an owner may change configured information relating to a camera (viewer) which is registered by that owner. A group owner is an individual who registers a particular group, selects Users who are granted access rights associated with that group, and enables particular camera and viewer devices to be associated with that group.

[0171] Picture file. A digital file containing a visual image captured by a camera, source and destination addresses and other associated information, in a format suitable for network transfer to a viewer directly or via temporary intermediate storage. A picture file may contain an audio clip and/or a text file. The optional audio clip and/or text file may be added by the camera as part of image capture, or added subsequently by a user. A picture file may include one or more picture modification file(s). A picture file may contain a view file, together with source and destination addresses and other associated information, in a format suitable for network transfer to a viewer directly or via temporary intermediate storage.

[0172] Put. (verb) An action initiated by a user or device with the purpose of delivering a picture file to another user or device. (noun) A message conveying a picture file from a particular user or device to a recipient device or user. A put message is preceded by a put request as part of the put action.

[0173] Reject. (noun) The action of denying an alert message. A reject may be explicitly sent by a receiving user or device; reject may be implicit based on expiration of a timer; and a reject may be created by inferred by the picture communications network subsystem based upon an inability to communicate with the receiving device (for example if the receiving device does not respond at the indicated network address).

[0174] Redirect. (verb) The action of redirecting a request to connect to another device or user. A receiving user may initiate a redirect upon receiving an alert. Alternatively, a receiving user may set connect rights in the registry to cause connection attempts from particular addresses to be redirected to other addresses.

[0175] Request. (verb) An action by which an initiating user device seeks an action by, or response from, a second user, device or group. (noun) A message conveying a request, for example a get picture file request directed to a camera by a viewer.

[0176] Register. (verb) An action by which a user record or device record is created within a registry.

[0177] Registry. (noun) A database containing user and device records as necessary for the operation of a picture communications system. User records in the registry include user name, owner name, access rights, and the name of any currently attached device. Device records in the registry include device name, class of device (for example, viewer, camera, or combination viewer and camera), access list, network interface address. See **FIG. 8** for more information on registry content.

[0178] Session. (noun) In the Open Systems Interconnection (OSi) communications model, the Session layer (sometimes called the "port layer") manages the setting up and taking down of the association between two communicating end points that is called a connection. A connection is maintained while the two end points are communicating back and forth in a conversation or session of some duration. Some connections and sessions last only long enough to send a message in one direction. However, other sessions may last longer, usually with one or both of the communicating parties able to terminate it.

[0179] Picture communications network subsystem. A computerized network system, attached to a suitable network such as the Internet, containing a picture communications system protocol front end (termed herein a server) and a registry back end. The picture communications network subsystem stores, within the registry, registration entries for users, devices and groups, along with information on the current status and network addresses of registered users and devices. The picture communications network subsystem processes registration requests, database update requests by owners, picture file exchange requests (e.g., Get_Picture_File and Send_Picture_File), registry queries and other actions.

[0180] User. (n) A named person. Among the actions a user may take, user may attach to a device, access registry services, connect to another user or device, join a group; detach from a device, disconnect from a user or device, leave a group, accept an alert, put a picture file to another device or user, get a picture file from another device, register a device while acting as owner of that device, and act become an owner.

[0181] Viewer. A device capable of receiving and displaying an image in a manner compliant with a picture communications system protocol specification. A viewer may be an application running within a computing device capable of displaying a picture file and capable of performing other functions. A viewer may also be embedded within a device specifically designed for this function. A camera and viewer

may exist in a single device. A camera may include a digital image display but not include a viewer, if (for example) the device is not capable of receiving and displaying a picture file from an external source. A viewer is also capable of receiving and displaying a picture modification file associated with a picture file.

[0182] View (or view file). A digital file containing (i) one or more stored picture(s), each of which may be associated with one or more picture modification files, (ii) layout instructions describing the placement of the pictures on a viewer screen, and (iii) sequencing instructions describing the order of display of referenced pictures and picture modification files, timing for display of each element in the sequence, and allowed user actions so that the viewer will display a time sequenced progression of images in a predetermined manner. A view file may be embedded within a picture file for communications via a picture service.

User's View

[0183] A user can perform many different operations. For example a user can operate a camera device that can capture and send a picture, or a viewer device that can receive and display a picture, or a device which supports the functions of both a camera and viewer.

[0184] FIGS. 14, 15, 16, 17, 18 and 19 are diagrams that provide several examples of how users might make use of a picture communications system.

[0185] FIG. 14 is a diagram of an arrangement wherein a first user puts a picture file to a second user. In FIG. 14, a camera 142 user 141 can send a picture 143 to a designated viewer 144 provided user 141 is on the access list of user 145 and/or of viewer 144.

[0186] FIG. 15 is a diagram of an arrangement wherein a first user gets a picture file from a second user. In FIG. 15, a user 151 of viewer 152 can request (get_picture_file 153) a picture 156 from a selected camera 154 provided user 151 is on the access list of camera 154 (or on the access list of user 155, provided user 155 is attached to camera 154).

[0187] FIG. 16 is a diagram of an arrangement wherein a first user puts a picture file to a second user through a group filter. In FIG. 16, a user 161 of camera 162 can send a picture 163 to a user 166 attached to a viewer 165 subject to a group 164 filter function, provided user 161 is on the access list of the group 164 providing the filter function for viewer 165 or user 166.

[0188] FIG. 17 is a diagram of an arrangement wherein a first user gets a picture file from a second user through a group filter. In FIG. 17 a user 171 attached to a viewer 172 can request (get_picture_file 173) a picture 177 from a camera 175 subject to a group 174 filter function if the requesting user 171 is on the access list of the group 174 providing the filter function for user 176.

[0189] FIG. 18 is a diagram of an arrangement wherein a first user gets a first picture file from a device through a first group filter affiliated with the first user, and the first user also gets a second picture file from a second user who is affiliated with a second group filter. In FIG. 18, a user 181 attached to a viewer 182 subject to a group 183 filter can get 184 a picture 188 from a camera 186 subject to a group 185 filter function, provided the requesting user 181 is on the access list of the group 185 filtering access to the selected camera 186 and further provided the selected camera 186 is on the access list of the group 183 filtering access to the requesting user 181.

[0190] FIG. 19 is a diagram of an arrangement wherein a first user puts a first picture file from a device through a group exploder filter to multiple users, and at least one of the multiple users modifies the first picture file and puts it through a group filter to the first user. In FIG. 19, a camera user 191 can send a picture 193 to a group of viewers 196 provided the sending user 191 is named on the access list of the group 195 providing the group exploder function to the receiving viewers 196 and users 197, and as further shown in FIG. 19, a user 191 sending a picture file 193 to a group 195 can receive a picture modification file 198 from a member user 197 of the group 195 receiving the picture file 193, provided the user 197 sending the picture modification file 198 is named on the access list of the group 194 filtering access to the intended recipient of the picture modification file (user 191).

[0191] Relating to the use and sharing of pictures, a viewer user may be provided with a number of options, depending upon the embodiment:

[0192] 1. store a picture in his viewer;

[0193] 2. select, retrieve and display a picture stored in his viewer;

[0194] 3. select, retrieve and invoke a picture modification file (i) associated with a particular picture, (ii) describing a set of picture editing actions, inserted shapes, inserted pointers, text tags and other visual markings, and (iii) which, when invoked, generates a modified view of the particular associated picture;

[0195] 4. define a view, consisting of (i) one or more stored picture(s), each of which may be associated with one or more picture modification files, (ii) layout instructions describing the placement of the pictures on a viewer screen, and (iii) sequencing instructions describing the order of display of referenced pictures and picture modification files, timing for display of each element in the sequence, and allowed user actions so that the viewer will display a time sequenced progression of images in a predetermined manner;

[0196] 5. send a picture to a remote viewer and to a group;

[0197] 6. send a picture modification file to a remote viewer and to a group;

[0198] 7. send a view to a remote viewer and to a group;

[0199] 8. receive a picture from a remote camera;

[0200] 9. receive a picture from a remote viewer;

[0201] 10. receive a picture modification file from a remote viewer;

[0202] 11. receive a view from a remote viewer.

[0203] A viewer may be a discrete, single-function device. A viewer may be an application program running within a

host computer, using the host computer display, operating system, storage system, keyboard, pointing device and communications services.

Picture Call

[0204] Relating to the communicating of pictures, a viewer user in this embodiment can do any of the following:

[0205] 1. request a picture from a selected camera;

[0206] 2. request a picture from a selected viewer;

[0207] 3. accept a picture from a remote camera;

[0208] 4. accept a picture from a remote viewer;

[0209] 5. open a session with a designated viewer for the purpose of sending and receiving pictures and picture modifications; and

[0210] 6. open a session with a designated group for the purpose of sending and receiving pictures and picture modifications to and from all other members of the group who also have a session open with the group.

[0211] Actions 1 through 4 above are discrete transactions between devices, and may in some cases be performed without establishing a session between the devices.

[0212] Actions 5 and 6 involve establishing and maintaining a session between devices, during which multiple transactions may take place. The duration of time for action 5 between the initial attempt to open a session and end of session may be referred to as a picture call.

Network View

[0213] Camera devices and viewer devices communicate over one or more networks. Commands, responses and pictures are transported by the network between devices. Each device is identified by a network address which is specific to the network and the access point.

[0214] Devices may move. That is, devices may change network access point and therefore network address. To accommodate device movement, a picture communications device registry is installed in the network. The registry allows a device to register with a unique name from a specific network address, so that another device can locate the current network address of a registered device by name.

Address Resolution

[0215] Each device is registered with a device name, and an initial network address. The device name is unique across all devices within the confines of a particular namespace, so that the device may be unambiguously addressed by name. A device name is associated with one and only one unique device address. A device name is selected by the device owner through the registration process, and name uniqueness is enforced during that registration process.

[0216] A Uniform Resource Name (URN) namespace may be established for picture communication devices in accordance with Internet Engineering Task Force (IETF) evolving concepts for URN. See for example "http://www.ietf.org/html.charters/urn-charter.html" on the World Wide Web. In this example, a Namespace identifier (NID) may be assigned by the Internet Assigned Numbers Authority (IANA).

[0217] An example of a specific device identifier may be "urn:pictall23456789abc" where the part "12345678abc" represents twelve hexadecimal characters corresponding to an assigned media access control (MAC) address drawn from the Institute of Electrical and Electronic Engineers (IEEE) Standard 802 address space. This example may be relevant for a device with an embedded Ethernet adapter or Bluetooth™ wireless technology device, each of which includes a globally unique device address assigned by the manufacturer according to IEEE Standard 802. Alternatively, a specific device identifier may be based upon the identification structure associated with a wireless network devices. For example, the Global System for Mobile (GSM) network standard set by the European Telecommunications Standards Institute (ETSI) is used by hundreds of millions of subscribers worldwide. In GSM, each handset device is assigned a globally unique International Mobile Equipment Identifier (IMEI) which is physically stored within the handset; and each subscription is assigned a globally unique International Mobile Subscriber Identifier (IMSI), which is physically stored within a Subscriber Identity Module (SIM) inserted by the subscriber into a GSM handset. In this example, a specific device physically associated with a GSM terminal might be assigned an identifier in which the IMEI is an integral element, and that specific device might be associated in the Registry with a network address based upon the GSM IMSI associated with the GSM terminal with that IMEI (by virtue of a SIM containing the IMSI being installed within the GSM device with the IMEI). Other device identification schemes and other namespace definitions are also possible.

[0218] The registry associates device name, current network address, last known network address and an owner for each device. Also, for each device, the registry maintains a record of groups in which the device is a member. For each registered device, the registry also maintains a record of user, device and group names whose members are allowed privileges with respect to the registered device. A device containing both viewer and camera may utilize a single device address.

[0219] Individual devices are addressed by device name, which the registry maps to a current network address. The registry may query a device at a particular network address and request the device address to verify the device identity.

Device registration

[0220] At any time after a device is first attached to a network, a user may invoke a new device registration process. To register the device manually, the user should know (i) the device name, (ii) an initialization key and/or other parameters stored in the device along with the device name, (iii) the network address through which the device may be contacted, and (iv) the network address of a selected registry (for example, the world wide web URL of the registration web page for that registry).

[0221] The user connects with the public Web site of the selected registry. The user begins new device registration by completing a form over a secure hypertext tag protocol (https) session using commonly available Internet browser technology. Next, the user causes the registry to connect to the subject device using the supplied (i) device name, (ii) device initialization key and (iii) network address through

which the device may be contacted. When connected, the registry authenticates the initialization key through a secure process. When authenticated, the registry next collects device information from the device. The user is now identified as the owner of the registered device. The user (now the owner) may now enter configuration information, modifying default information on the device, register a unique name for the device, enter a longer descriptive name for information purposes, and define other devices and users who may be allowed to contact the device.

[0222] A device may be registered automatically if the device has the capacity to locate a registry on a network. Upon locating a registry, an initial registration process identifies the device to the registry and opens a record using a name either preprogrammed into the device or entered into the device by a user. The device registration enters a pending state the accesses the registry, for example through a public web site, identifies the device name and an authentication key embedded in the device and accessible only to someone in physical control of the device. Once authenticated, the owner can complete the registration.

Redirection for Hidden Devices

[0223] The registry also offers a redirection service. A device registration may indicate that the network address is not to be provided to any other device. In this case, a picture communications action intended for the hidden device is addressed to hidden device by name at the network address of the registry. Based on the request, the registry sends the appropriate command to the hidden device using the network address securely stored at the registry. The hidden device may choose to reply (1) directly to the other device or (2) indirectly by addressing a reply to the registry for forwarding to the other device.

Accounting for Usage

[0224] The network and attached cameras and viewers are assets owned and operated by different parties with a variety of business interests. The network may provide accounting services. Each device may be configured to generate a picture detail record (PDR) for each action taken in response to a request from a remote device The PDR is forwarded to an accounting server for processing. Each PDR identifies the action requested, the device address of the requesting party and the responding party, the time and date, and the disposition of the request. A PDR may comprises one or more of the following:

[0225] 1. Originating device name

[0226] 2. Destination device name

[0227] 3. Responsible party

[0228] 4. Event type (e.g., picture transfer)

[0229] 5. Event size (e.g., file size)

[0230] 6. Time stamp (32 bits; time and date)

[0231] 7. Duration of event (e.g., a session or a group call)

Picture File

[0232] A standard picture file format for exchange among devices is important for the embodiment of the picture communications system envisioned herein. While some flexibility in parameters is possible, for example to permit a small number of picture resolution choices, it is important that one basic mode be universally adopted, and that a specific set of variations be supported on all devices.

[0233] Each image contained in a picture file may be encoded using a standard format such as the Joint Photography Experts Group (JPEG) encoding algorithms, in a file format compatible with JPEG File Interchange Format (JFIF).

[0234] picture files may contain additional information in a standard, precisely defined format for use by the envisioned picture communications system. Pictures may be uniquely identified within the picture file by originating device name and a time stamp.

[0235] In this example, the originating device should synchronize timing with the network-based registry. This enables a viewer to determine the actual time of origin of a specific picture file.

[0236] A conference is an ad hoc connection among more than two devices. In a Conference, a picture is sent to all viewers in the conference by the originating device. That is, an originating device wishing to share a picture originates "N−1" messages if there are "N" devices active in a conference.

Security

[0237] The registry may supply the following security functions and services:

[0238] 1) Device authentication, using the initialization number and device address by the owner at the time of registration,

[0239] 2) Public key storage for each registered device, which may be used for such purposes as authentication, message integrity and non-repudiation.

[0240] Picture file services may include mechanisms for supporting confidential transport of a picture file between source and destination device. When a viewer requests a picture from a camera, the viewer may specify that the picture be transported using confidential mechanisms.

[0241] For example, picture file service may rely upon public key encryption mechanisms and upon public key storage in the registry. In this example, the viewer sends its public key to the camera as part of the request. The camera uses its private key and the viewer's public key to encrypt the picture. The viewer obtains the camera's public key from the registry, and uses that public key together with the viewer's own private key to decrypt the picture.

[0242] To prepare an encrypted picture for delivery to another viewer in this example, an originating viewer obtains the destination viewer's public key from the registry. The originating viewer uses that public key together with it's own private key to encrypt the picture. The destination viewer obtains the public key of the originating viewer from the registry and uses that public key together with its own private key to decrypt the picture. When establishing a picture call session, one or both viewers may use the public key of the other viewer to initiate a secure session between

the viewers. During the initial secure session the viewers may negotiate a unique session key for use during the session.

Network Interface

[0243] A picture communications system device, such as a camera or a viewer, may attach to one or more of a plurality of networks. A device may be attached to a network through a Network Interface (NI). Examples of a NI may include:

[0244] 1. a cellular handset which may provide digital data transport service to the Internet by means of circuit switched data service over a public cellular network such as one using AMPS, IS-136 TDMA, or IS-95 CDMA technology;

[0245] 2. a PCS handset which may provide digital data transport service to the Internet by means of circuit switched data service over a wireless digital network, such as a GSM network or a CDMA network;

[0246] 3. a GSM handset which supports General Packet Radio Service (GPRS) over a GSM network and thence by means of a GPRS Gateway Service Node (GGSN) to the Internet;

[0247] 4. an Ethernet adapter which is connected to a local area network (LAN) and thence by means of a gateway to the Internet;

[0248] 5. a product based on Bluetooth T technology and which connects wirelessly over a short range to a network access point by using Bluetooth technology;

[0249] 6. a cellular network terminal with cellular digital packet data (CDPD) technology and thence by means of a gateway to the Internet

[0250] 7. a cable modem attached to a cable television facility and supporting digital high speed access to the Internet;

[0251] 8. a circuit switched dial-up modem connection to an Internet service provider (ISP) over the public switched telephone network (PSTN).

[0252] A particular example might combine multiple technologies. For example, a camera might include a Bluetooth wireless technology interface, through which it attaches to a GSM handset that also includes Bluetooth wireless technology.

[0253] A Network Interface may be assigned a network address by the network with which it is associated. A Network Interface may be assigned a unique device address which is permanently associated with the physical device. A Network Interface which is permanently associated with the picture communications system device may have a single unique device address useful in its function as a network interface device and in its function as a picture communications system device.

Picture Answering Machine

[0254] FIG. 20 is a schematic diagram illustrating a picture-file answering machine interposed between the viewer or connected to the viewer and the communication network such as the internet. In FIG. 20, a picture answering machine is a user interface device that may act as a surrogate viewer while a viewer device is detached from the network. A picture answering machine might be described as a device clone, in that it stores the associated viewer's device address and characteristics, and remains attached to the network address registered for the device address.

[0255] A picture answering machine may be configured by the user in a variety of ways, for example (1) to receive and store pictures sent to the viewer associated with the picture answering machine, (2) to answer a picture call from devices with permission to call the viewer.

[0256] A picture answering machine may enable a user to detach a viewer from the network temporarily without missing attempts by another device to deliver a picture or initiate a picture call.

[0257] It will be appreciated by those skilled in the art, in view of these teachings, that alternative embodiments may be implemented without deviating from the spirit or scope of the invention. This invention is to be limited only by the following claims, which include all such embodiments and modifications when viewed in conjunction with the above specification and accompanying drawings.

What is claimed is:

1. A picture communications network subsystem for providing real-time picture communication services, comprising:

one or more protocol communications nodes connected to one or more networks, said one or more nodes providing communication between said network and said picture communications network subsystem;

a registry that includes

user information for a plurality of users, including a user name that uniquely identifies each user, access information, and an owner of each user,

device information for a plurality of devices, including a device name that uniquely identifies each device, access information, and an owner of each device, and

group information for a plurality of groups that provide access rights to users, devices, and other groups, including a group name that uniquely identifies each group, access information, and an owner of each group; and

a control subsystem including a system for establishing real-time communication services between users, devices, and groups responsive to a request by a user or a device.

2. The picture communications network subsystem of claim 1 wherein said control subsystem includes a system for attaching a user to a device so that said user is associated with said device during the time period while the user is attached to said device.

3. The picture communications network subsystem of claim 2 wherein said control subsystem includes a system for locating said attached device, thereby providing a system to locate said attached user.

4. The picture communications network subsystem of claim 1 wherein said control subsystem includes a system

for using said user information to determine access rights of a selected user to other users, devices, and groups.

5. The picture communications network subsystem of claim 1 wherein said control subsystem includes a system for using said device information to determine access rights of a selected device to users, other devices, and groups.

6. The picture communications network subsystem of claim 1 wherein said control subsystem includes a system for using said group information to determine access rights of a selected group to users, devices, and other groups, and said group information includes recipient lists and access lists.

7. The picture communications network subsystem of claim 1 wherein said control subsystem further comprises a system for registering a user in the registry, including a system for creating a user record and populating said record with user information relating to said user.

8. The picture communications network subsystem of claim 1 wherein said control subsystem further comprises a system for registering a device in the registry, including a system for creating a device record and populating said device record with device information relating to said device.

9. The picture communications network subsystem of claim 1 wherein said control subsystem further comprises a system for registering a group in the registry, including a system for creating a group record and populating said group record with group information relating to said group.

10. A method for communicating image data between a first and a second user, comprising the steps of

using a picture communications system to open a substantially real time still image communication session between said first and second users;

transmitting said image data from said first user to said second user during said open communication session;

displaying an image responsive to said transmitted image data; and

viewing said image by said recipient.

11. The method of claim 10 further comprising the step of using the picture communications system to establish a voice communication session.

12. The method of claim 10 further comprising said first user selecting said second user and requesting that said picture communications system establish said real time communication session.

13. The method of claim 10 further comprising said second user selecting said first user and requesting that said picture communications system establish said real time communication session.

14. The method of claim 10 further comprising the step of capturing a digital image by said first user during said session, and communicating said digital image substantially in real time.

15. The method of claim 10 further comprising the step of capturing a digital image by said first user previous to said session, and communicating said digital image during said session.

16. A method for communicating image information between a sender and a recipient, comprising the steps of

selecting a recipient;

connecting to a picture communications network subsystem;

utilizing said picture communications network subsystem to establish a session between said sender and said recipient, including

alerting said recipient substantially immediately by transmitting an alert from said sender to said recipient,

responsive to said alert, sending an acknowledgment by said recipient, and

responsive to said receipt of said acknowledgement by said sender, establishing communication services to enable said session; and

transmitting a digital image from said sender to said recipient during said session.

17. The method of claim 16 wherein if said recipient does not acknowledge within a predetermined time period, then establishing a communication session with a location predetermined by said recipient, forwarding said digital image to said predetermined location, and storing it at said predetermined location.

18. The method of claim 16 further comprising the step of capturing a digital image by said sender during said session, and communicating said digital image substantially in real time to said recipient.

19. The method of claim 16 further comprising the step of transforming said digital image into a predetermined picture file format before transmitting said digital image.

20. The method of claim 16 further including the step of establishing a voice session and transmitting a voice message during said session.

21. The method of claim 16 further comprising the step of viewing said digital image by said recipient in a viewer.

22. The method of claim 21 further comprising the steps of editing said image, annotating said image with text and marking said digital image by said recipient, and transmitting said edited, annotated, and marked digital image to said sender during said session.

23. The method of claim 22 further comprising the steps of transmitting a file indicative of said edited, annotated and marked digital image during said open communication session.

24. The method of claim 21 further comprising the step of verbally annotating said digital image by said recipient, and transmitting said verbal annotations to said sender during said session.

25. The method of claim 21 further comprising annotating said image with text and markings by said recipient, and transmitting said annotated digital image to said sender during said session.

26. The method of claim 25 further comprising the steps of editing and annotating said previously annotated file by said sender, and transmitting said edited and annotated file to said recipient.

27. The method of claim 16 further comprising the step of previewing said digital image by said sender in a viewer.

28. The method of claim 27 further comprising the step of annotating said digital image with text and markings by said sender, and transmitting said annotated digital image during said session to said recipient.

29. The method of claim 16 wherein the step of establishing said session includes setting up services over a wireless system.

30. The method of claim 29 wherein said step of establishing said session includes setting up network services from a group comprising: digital wireless wide area networks including cellular and personal communication systems (PCS) including packet data services such as GPRS over GSM technology, PSTN, the Internet, CDPD (cellular digital packet data) service, digital telephone service, and an Intranet.

31. The method of claim 16 further comprising establishing said session over a network, and utilizing a short range wireless link that connects a device operated by one of said sender and recipient to a network interface with said network.

32. A method for viewing an image by a viewer using a remotely-positioned camera, comprising the steps of:

connecting over a network to a picture communication network subsystem;

using said network subsystem to identify a plurality of remotely-positioned cameras;

selecting, by said viewer, one of said plurality of remotely-positioned cameras;

determining, by said network subsystem, that said viewer has the right to access said remotely-positioned camera;

locating, by said network subsystem, said remotely-positioned camera;

sending a request from said viewer to said remotely-positioned camera using said picture communications system, said request including an instruction to capture a digital image;

responsive to said request, establishing network services that enable a substantially real time communication session with said remotely-positioned camera;

capturing a digital image using said remotely-positioned camera;

transmitting said digital image from said remotely-positioned camera to said viewer in substantially real- time over said open communication network; and

viewing said digital image by said viewer.

33. The method of claim 32 wherein said request includes one or more instructions selected from the group comprising: camera aperture, shutter speed, focal length, image resolution, and flash setting, and further comprising the step of controlling said remotely-positioned camera in accordance with said one or more instructions during said image-capturing step.

34. The method of claim 32 further comprising the step of accessing said remotely-positioned camera over a wireless system.

35. The method of claim 32 further comprising establishing said session over a network, and utilizing a short range wireless link that connects a device operated by one of said camera and viewer to a network interface with said network.

36. A computer-implemented method for networking a plurality of viewers and a plurality of remotely-positioned cameras, comprising the steps of:

registering a plurality of cameras with a picture communication network subsystem, including uniquely identifying each of said plurality of cameras in a registry database;

registering an owner for each camera in said registry database;

registering each of a plurality of viewers with said picture communication network subsystem, thereby uniquely identifying each of said plurality of viewers in said registry database; and

registering a plurality of users in said registry database.

37. The method of claim 36, wherein said step of registering said camera includes the step of connecting said camera to said network server, downloading registration information included with said camera into said server, and associating an owner with said camera.

38. The method of claim 36 and further comprising the step of monitoring the most recent location of each of said cameras and viewers.

39. The method of claim 36 further comprising the step of assigning access rights for each viewer that define such viewer's access rights to each camera.

40. The method of claim 36 further comprising the step of receiving in said server a request from one of said cameras to access at least one of said viewers selected by said camera, and responsive thereto, sending an alert to said at least one viewer.

41. The method of claim 40, further comprising the step of sending an acknowledgement from said at least one viewer to said camera, and opening a communication session between said camera and said viewer for digital image transmission.

42. The method of claim 41 further comprising the step of opening said communication session over a wireless system.

43. The method of claim 36 further comprising the step of receiving in said picture communication network subsystem a request from one of said viewers to access at least one of said cameras selected by said viewer, and responsive thereto, opening a communication session between said viewer and said camera for digital image transmission.

44. The method of claim 43 further comprising the step of establishing said communication services for said session over a wireless system.

45. The method of claim 43 wherein said step of opening said communication session over a network selected from a group comprising: digital wireless wide area networks including cellular and personal communication systems (PCS) including packet data services such as GPRS over GSM technology, PSTN, the Internet, CDPD (cellular digital packet data) service, digital telephone service, and an Intranet based upon public specifications.

46. The method of claim 43 wherein said request includes one or more instructions selected from the group comprising: camera aperture, shutter speed, focal length, image resolution, and flash setting, and further comprising the step of controlling said remotely-positioned camera in accordance with said one or more instructions during said image-capturing step.

47. The method of claim 43 further comprising the step of verifying that said viewer has access to said camera, and if not, then not allowing communication between said viewer and said remotely-positioned camera.

48. A method for communicating image information between a first user and a second user, comprising the steps of:

utilizing a picture communications system to establish a two-way communication session between said first and second users;

transmitting a digital image from said first user to said second user during said session;

revising said digital image by said second user;

transmitting said revised digital image to said first user during said session.

49. The method of claim 48 further comprising the steps of:

transmitting said digital image to a plurality of users simultaneously with said transmission to said second user, and

transmitting said revised digital image to said plurality of users simultaneously with said transmission of said revised digital image to said first user.

50. The method of claim 49, further comprising the step of re-revising said revised digital image by one of said plurality of users, and transmitting said re-revised image to said first user, said second user, and said plurality of users.

51. The method of claim 48 further including the step of transmitting a voice message over said open communication session.

52. The method of claim 48 further including the step of exchanging verbal communications between said first and second users during said two-way session.

53. The method of claim 48 further comprising the steps of revising by said first user said digital image previously revised by said second user, and transmitting said revised digital image from said first user to said second user.

54. The method of claim 53 further comprising the step of revising said digital image a plurality of times, and exchanging a series of revised digital images between said first and second users.

55. The method of claim 48 wherein said step of transmitting said revised digital image includes transmitting said revisions without the revised digital image over said communication session so that said revisions are efficiently transmitted.

56. The method of claim 55 further comprising the step of receiving said revisions and responsive thereto constructing the corresponding revised digital image.

57. The method of claim 48 wherein the step of establishing communication services includes establishing services over a wireless system.

58. The method of claim 48 further comprising establishing said session over a network, and utilizing a short range wireless link that connects a device operated by one of said first and second users to a network interface with said network.

* * * * *

I IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re patent of Rikard M. Kjellberg *et al.*	§	Attorney Docket No.: 185945.011700
	§	
U.S. Patent No. 7,233,790	§	Customer No.: 67395
	§	
Issue Date: June 19, 2007	§	
	§	
Filing Date: June 19, 2003	§	
	§	
For: DEVICE CAPABILITY BASED DISCOVERY PACKAGING AND PROVISIONING OF CONTENT FOR WIRELESS MOBILE DEVICES	§	

Mail Stop "*Ex Parte* Reexam"
Attn: Central Reexamination Unit
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

CERTIFICATE OF SERVICE

It is certified that, pursuant to 37 C.F.R. § 1.510(b)(5), copies of the following documents have been served in their entireties on the patent owner at the correspondence address provided for in 37 C.F.R. § 1.33(c):

1. Request for *Ex Parte* Reexamination of U.S. Patent No. 7,233,790 Transmittal Form, PTO/SB/57

2. Request for *Ex Parte* Reexamination of U.S. Patent No. 7,233,790 Pursuant to 37 C.F.R. § 1.510 and accompanying appendices and exhibits:

Ex. 1001	U.S. Patent No. 7,233,790 to Kjellberg et al. ("the '790 Patent" or "the Challenged Patent")
Ex. 1002	Declaration of A. L. Narasimha Reddy, Ph.D. ("Reddy Decl.")
Ex. 1003	File History Excerpts from U.S. Patent Application No.

	10/600,746 obtained from PAIR
Ex. 1004	U.S. Patent Application Publication No. 2002/0078178 to Senoh ("Senoh")
Ex. 1005	U.S. Patent No. 6,035,339 to Agraharam et al. ("Agraharam")
Ex. 1006	U.S. Patent No. 6,421,726 to Kenner et al. ("Kenner")
Ex. 1007	U.S. Patent No. 6,345,279 to Li et al. ("Li")
Ex. 1008	K. H. Britton, et al. *Transcoding: Extending e-business to new environments*, IBM Systems J. Vol. 40, No. 1, 2001, pp.153-178.
Ex. 1009	Andrew Perkis, et al., *Universal Multimedia Access from Wired and Wireless Systems*, Circuits Systems Signal Processing, Vol. 20, No. 3, 2001, pp.387-402
Ex. 1010	Rakesh Mohan, et al., *Adapting Multimedia Internet Content for Universal Access*, IEEE Transactions on Multimedia, Vol. 1, No. 1 (Mar. 1999), pp.104-114
Ex. 1011	U.S. Patent No. 7,551,913 to Chien
Ex. 1012	U.S. Patent Application Publication No. 2001/0032355 to Jones

3. Information Disclosure Statement, PTO/SB/08, listing references cited in the Request for Ex Parte Reexamination of U.S. Patent No. 7,233,790 pursuant to 35 U.S.C. § 302 and 37 C.F.R. § 1.510.

The copy has been served on June 23, 2022 by causing the aforementioned documents to be deposited in the United States Postal Service as priority mail postage pre-paid in a package addressed to:

Kilpatrick Townsend & Stockton LLP (I)
Mailstop: IP Docketing – 22
1100 Peachtree Street
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Dated: June 23, 2022

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Electronic Patent Application Fee Transmittal

Application Number:	
Filing Date:	
Title of Invention:	DEVICE CAPABILITY BASED DISCOVERY PACKAGING AND PROVISIONING OF CONTENT FOR WIRELESS MOBILE DEVICES
First Named Inventor/Applicant Name:	Rikard M. Kjellberg
Filer:	Andrew Ryan Sommer/Judi Cordo
Attorney Docket Number:	185945.011700

Filed as Large Entity

Filing Fees for ex parte reexam

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
EX PARTE REEXAMINATION (1.510(A)) NON-STREAMLINED	1812	1	12600	12600
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
			Total in USD ($)	**12600**

Electronic Acknowledgement Receipt	
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First Named Inventor/Applicant Name:	Rikard M. Kjellberg
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Payment Type	DA
Payment was successfully received in RAM	$12600
RAM confirmation Number	E20226MC13441725
Deposit Account	506990
Authorized User	Andrew Sommer
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: 37 CFR 1.17 (Patent application and reexamination processing fees) 37 CFR 1.19 (Document supply fees)	

37 CFR 1.20 (Post Issuance fees)

37 CFR 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal Letter	185945_011700_transmittal.pdf	250027 671322bb3811e667485f769d14ccee928bf49134	no	4
Warnings:					
Information:					
2	Reexam - Change in Power Attorney for Third Party Requester	185945_011700_reexam_power.pdf	174100 6a1f0acedbbc9e77da02c4ff110f72fbfb23f207	no	1
Warnings:					
Information:					
3	Reexam - Info Disclosure Statement Filed by 3rd Party	185945_011700_reexam_ids.pdf	1263939 176e11649ca44685f223cba0e78f150cb9c9dbfd	no	5
Warnings:					
Information:					
4	Reexam - Affidavit/Declaration/Exhibit Filed by 3rd Party	185945_011700_reexam_exhibit_1001.pdf	1570012 57f75cd86cea63284c5d7a09c1b4b5d245a54ab1	no	25
Warnings:					
Information:					
5	Reexam - Affidavit/Declaration/Exhibit Filed by 3rd Party	185945_011700_reexam_exhibit_1002.pdf	7651907 a2434cd4472376af162a203a24307a184634e2d1	no	144
Warnings:					
Information:					
6	Reexam - Affidavit/Declaration/Exhibit Filed by 3rd Party	185945_011700_reexam_exhibit_1003.pdf	3972885 76c79a0aac3f99e6a1b593778fb98ab89fb5dd3d	no	72
Warnings:					
Information:					

7	Reexam - Affidavit/Declaration/Exhibit Filed by 3rd Party	185945_011700_reexam_exhibit_1004.pdf	971155 b503e756ac229948cb42bc34c32299597d92172f	no	15
Warnings:					
Information:					
8	Reexam - Affidavit/Declaration/Exhibit Filed by 3rd Party	185945_011700_reexam_exhibit_1005.pdf	784793 cfe61f508737c7c8ced38ee3fcdd65ec86442c1d	no	14
Warnings:					
Information:					
9	Reexam - Affidavit/Declaration/Exhibit Filed by 3rd Party	185945_011700_reexam_exhibit_1006.pdf	1487977 d3b79184d4f7bd4e6f5950ee4aca074c2a3b8dba	no	18
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10	Reexam - Affidavit/Declaration/Exhibit Filed by 3rd Party	185945_011700_reexam_exhibit_1007.pdf	1056563 89fd890a378175456af472182218d9d59b09f83c	no	15
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11	Reexam - Affidavit/Declaration/Exhibit Filed by 3rd Party	185945_011700_reexam_exhibit_1008.pdf	2210050 392d69d5a977545b5ab2967cb3c5cc39404f896b	no	27
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12	Reexam - Affidavit/Declaration/Exhibit Filed by 3rd Party	185945_011700_reexam_exhibit_1009.pdf	1001387 653c17a164a1e152b43ef455e6aec1bdcc7418f8	no	16
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13	Reexam - Affidavit/Declaration/Exhibit Filed by 3rd Party	185945_011700_reexam_exhibit_1010.pdf	1112620 0af482aa330a91ed1c7914e2d00d3e7983df964c	no	11
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14	Reexam - Affidavit/Declaration/Exhibit Filed by 3rd Party	185945_011700_reexam_exhibit_1011.pdf	774188 3ff65fdce7f8f26d89993cc2a88fd440bcc69efb	no	9
Warnings:					
Information:					
15	Reexam - Affidavit/Declaration/Exhibit Filed by 3rd Party	185945_011700_reexam_exhibit_1012.pdf	2465789 d829276194f274ca4e9e413687133503559 05a45	no	36
Warnings:					
Information:					
16	Reexam Certificate of Service	185945_011700_reexam_certificate_of_service.pdf	159190 4c2b31689055cf38662b2ab772aaab37ad7 5ac77	no	3
Warnings:					
Information:					
17	Receipt of Original Ex Parte Request by Third Party	185945_011700_request_for_reexam.pdf	1491345 045ff64dcff1f1592b1cb75704223d3935f02 a5b	no	215
Warnings:					
Information:					
18	Fee Worksheet (SB06)	fee-info.pdf	38418 b6caed3046b1925fa394675ae9701714bc2 ca3bd	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	28436345		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re patent of Rikard M. Kjellberg *et al.*	§	Attorney Docket No.: 185945.011700
	§	
U.S. Patent No. 7,233,790	§	Customer No.: 67395
	§	
Issue Date: June 19, 2007	§	
	§	
Filing Date: June 19, 2003	§	
	§	
For: DEVICE CAPABILITY BASED DISCOVERY PACKAGING AND PROVISIONING OF CONTENT FOR WIRELESS MOBILE DEVICES	§	

REQUEST FOR *EX PARTE* REEXAMINATION OF U.S. PATENT 7,233,790

Mail Stop "*Ex Parte* Reexam"
Attn: Central Reexamination Unit
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Commissioner:

Pursuant to the provisions of 35 U.S.C. §§ 301-307, Unified Patents, LLC ("Requester") hereby requests an *ex parte* reexamination of claims 1-2, 4, and 8-9 (the "Challenged Claims") of U.S. Patent 7,233,790 (the "'790 Patent, Ex. 1001), which issued on June 19, 2007 based on U.S. Patent Application 10/600,746 (the "'746 Application"), which claims the benefit of four provisional applications, each of which was filed on June 28, 2002. The '790 Patent is currently assigned to VideoLabs, Inc. ("VideoLabs" or "Patent Owner"). The assignment is recorded in the U.S. Patent and Trademark Office ("USPTO") at reel/frame 054727/0726.

This Request presents prior art references and analyses that are noncumulative of the prior art that was before the Examiner during the original prosecution of the '790 Patent and speaks directly to the reasons the original claims were originally allowed. As demonstrated herein, the

Challenged Claims are invalid over these references. Requester therefore requests that an order for reexamination and an Office Action rejecting claims 1-2, 4, and 8-9 be issued.

Ex Parte Patent Reexamination Filing Requirements

Pursuant to 37 C.F.R. § 1.510(b)(1), statements pointing out at least one substantial new question of patentability based on material, non-cumulative reference patents and printed publications for the Challenged Claims of the '790 Patent are provided in Section III of this Request.

Pursuant to 37 C.F.R. § 1.510(b)(2), reexamination of the Challenged Claims (claims 1-2, 4, and 8-9) of the '790 Patent is requested, and a detailed explanation of the pertinence and manner of applying the cited references to the Challenged Claims is provided in Section IV of this Request.

Pursuant to 37 C.F.R. § 1.510(b)(3), copies of every patent or printed publication relied upon or referred to in the statement pointing out each substantial new question of patentability or in the detailed explanation of the pertinence and manner of applying the cited references are provided as Exhibits 1001, 1004-1012 (with Exhibits 1004-1007 forming the basis for the SNQ presented herein) and Appendices A-C of this Request.

Pursuant to 37 C.F.R. §1.510(b)(4), a copy of the '790 Patent is provided as Exhibit 1001 of this Request, along with a copy of any disclaimer, certificate of correction, and reexamination certificate issued corresponding to the patent.

Pursuant to 37 C.F.R. § 1.510(b)(5), the attached Certificate of Service indicates that a copy of this Request, in its entirety, has been served on Patent Owner at the following address of record for Patent Owner, in accordance with 37 C.F.R. § 1.33(c):

Kilpatrick Townsend & Stockton LLP (I)
Mailstop: IP Docketing – 22
1100 Peachtree Street
Suite 2800
Atlanta, GA 30309

Also submitted herewith is the fee set forth in 37 C.F.R. § 1.20(c)(1).

Pursuant to 37 C.F.R. § 1.510(b)(6), Requester hereby certifies that the statutory estoppel provisions of 35 U.S.C. § 315(e)(1) and 35 U.S.C. § 325(e)(1) do not prohibit Requester from filing this *ex parte* patent reexamination request.

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TABLE OF EXHIBITS

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Ex. 1001	U.S. Patent No. 7,233,790 to Kjellberg et al. ("the '790 Patent" or "the Challenged Patent")
Ex. 1002	Declaration of A. L. Narasimha Reddy, Ph.D. ("Reddy Decl.")
Ex. 1003	File History Excerpts from U.S. Patent Application No. 10/600,746 obtained from PAIR
Ex. 1004	U.S. Patent Application Publication No. 2002/0078178 to Senoh ("Senoh")
Ex. 1005	U.S. Patent No. 6,035,339 to Agraharam et al. ("Agraharam")
Ex. 1006	U.S. Patent No. 6,421,726 to Kenner et al. ("Kenner")
Ex. 1007	U.S. Patent No. 6,345,279 to Li et al. ("Li")
Ex. 1008	K. H. Britton, et al. *Transcoding: Extending e-business to new environments*, IBM Systems J. Vol. 40, No. 1, 2001, pp.153-178.
Ex. 1009	Andrew Perkis, et al., *Universal Multimedia Access from Wired and Wireless Systems*, Circuits Systems Signal Processing, Vol. 20, No. 3, 2001, pp.387-402
Ex. 1010	Rakesh Mohan, et al., *Adapting Multimedia Internet Content for Universal Access*, IEEE Transactions on Multimedia, Vol. 1, No. 1 (Mar. 1999), pp.104-114
Ex. 1011	U.S. Patent No. 7,551,913 to Chien
Ex. 1012	U.S. Patent Application Publication No. 2001/0032355 to Jones

I. CLAIMS FOR WHICH REEXAMINATION IS REQUESTED

Before explaining the substantial new question of patentability (SNQ) presented in this Request along with a brief summary of the '790 Patent, the claims of the '790 Patent for which reexamination is requested are provided. Claims 1, 2, 8, and 9 are independent claims. Challenged claim 4 depends from challenged claim 2.

> **1.** A method of providing access to content for use on wireless communication devices, the method comprising:
>
> receiving and storing a plurality of items of content to be made available for use in wireless communication devices used by a plurality of wireless services subscribers, including receiving a plurality of different implementations of at least one of the items of content, where each implementation of any given item of content corresponds to a different set of device capabilities; and
>
> maintaining a product catalog containing a description of the items of content, the product catalog including, in association with each item of content, a reference to each implementation of said item of content.
>
> **2**. A method of providing access to digital content for use on wireless communication devices, the method comprising:
>
> receiving and storing in a server system a plurality of items of digital content to be made available for use in wireless communication devices used by a plurality of wireless services subscribers, including receiving and storing a plurality of different implementations of at least one of the items of digital content, where each implementation of any given item of digital content corresponds to a different set of device capabilities;
>
> operating the server system to maintain a product catalog containing a description of the items of digital content, wherein the product catalog includes, in association with each item of digital content, a reference to each implementation of said item of digital content;
>
> receiving a request from a wireless device used by one of the subscribers;
>
> in response to the request, selecting a portion of the product catalog to be presented to the subscriber, based on device capabilities of the wireless device used by the subscriber; and
>
> presenting the selected portion of the product catalog to the subscriber via a wireless network, such that the selected portion, as presented to the subscriber, provides only a single description of each item of digital content in said portion, regardless of the number of implementations of each said

item.

4. A method as recited in claim 2, further comprising:

receiving from the subscriber a request for one of the items of digital content in said portion of the product catalog;

selecting an implementation of the requested item of digital content, based on device capabilities of the wireless device used by the subscriber; and

downloading the selected implementation of the item of digital content to the wireless device used by the subscriber.

8. A system comprising:

a network interface through which to communicate over a communication network; and

a download manager to

receive and store a plurality of items of content to be made available for use in wireless communication devices used by a plurality of wireless telecommunications subscribers, including receiving a plurality of different implementations of at least one of the items of content, where each implementation of any given item of content corresponds to a different set of device capabilities; and

maintain a product catalog containing a description of the items of content, the product catalog including, in association with each item of content, a reference to each implementation of said item of content.

9. A system comprising:

a processor; and

a storage facility accessible to the processor and containing code which, when executed by the processor, causes the processing system to

receive and store a plurality of items of digital content to be made available for use in wireless communication devices used by a plurality of wireless telecommunications subscribers, including receiving and storing a plurality of different implementations of at least one of the items of digital content, where each implementation of any given item of digital content corresponds to a different set of device capabilities;

maintain a product catalog containing a description of the items of digital content, wherein the product catalog includes, in association with each item of digital content, a reference to each implementation of said item of digital

content;

receive a request from a wireless device used by one of the subscribers;

in response to the request, select a portion of the product catalog to be presented to the subscriber, based on device capabilities of the wireless device used by the subscriber; and

cause the selected portion of the product catalog to be presented to the subscriber via a wireless telecommunications network, such that the selected portion, as presented to the subscriber, provides only a single description of each item of digital content in said portion, regardless of the number of implementations of each said item.

II. U.S. PATENT 7,233,790

A. Overview

The '790 patent describes a system and method for distributing "digital products from multiple suppliers to wireless services subscribers . . . ." Ex. 1001 ('790 pat.), Abstract. "Product suppliers can publish and manage their products on the server system via a computer network and make their products available to the subscribers for purchase or licensing." *Id.*; *see also id.*, 1:13-18. "Multiple different implementations of any product can be maintained, where each implementation corresponds to a different set of device capabilities." *Id.*

The '790 patent explains that wireless devices at the time of the invention such as "cellular telephones, personal digital assistants (PDAs) and two-way pagers, have become commonplace in many countries." Ex. 1001 ('790 pat.), 1:22-25. These devices had more capabilities than their predecessors such as allowing users to play games, send email, download files, and "send and receive video." *Id.*, 1:34-39 (describing the "latest generation of mobile telephones (and other mobile devices)"). According to the patent, users typically had to obtain new digital content for their mobile devices directly from the content suppliers via a wireless network using the Internet. *Id.*, 1:45-53. Making users go directly to the content providers was inconvenient for the users when users wanted content from multiple content providers. *Id.*, 1:53-59. The '790 patent explains that content providers needed to deploy content multiple times and package it differently for each of the various devices on the market because those devices had different capabilities and provisioning models. *Id.*, 1:60-2:4. It was allegedly burdensome for content providers to "package and provision the digital content they produce in a manner that is suitable for all of the devices in the marketplace," which also requires the content suppliers to keep up with device development. *Id.*,

2:4-17.

In one embodiment described in the '790 patent, "multiple different implementations of at least one of the items of content are received, where each implementation corresponds to a different set of device capabilities." Ex. 1001 ('790 pat.), 2:60-63. A product catalog is maintained which includes a description of the items of content and reference to "each implementation of the item of content." Ex. 1001 ('790 pat.), 2:65-67. The embodiment are "implemented in a network server system that includes one or more server computer systems on a network" that includes "an application server referred to . . . as the 'download manager'." *Id.*, 3:63-4:1. Using the sever-based download manager application, content providers can make their content available to subscribers. *Id.*, 4:1-8.

As shown in Figure 1 of the '790 patent (reproduced below), "[t]he download manager 1 acts as an intermediary between multiple content suppliers . . . and multiple customers . . . , e.g., wireless services subscribers . . . ." Ex. 1001 ('790 pat.), 4:9-14.

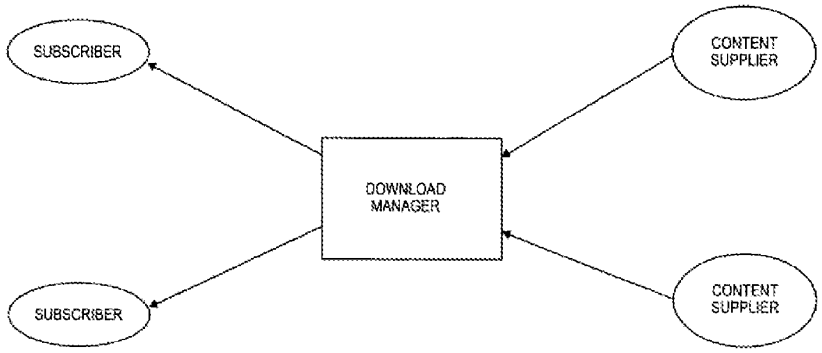


FIG. 1

Ex. 1001 ('790 pat.), FIG. 1.

The download manager application includes a "device capability manager" that is "responsible for device recognition (e.g., supporting device recognition through UAProf using Profile headers and Profile-Diff headers), device capability determination (e.g., retrieving device descriptors using best efforts and appending device capabilities to the session context), and device capability management (e.g., automated management of UAProf capable devices and quarantine of undefined or partially defined devices." Ex. 1001 ('790 pat.), 7:4-7, 7:31-39; *see also id.*, 8:30-52. One reason devices are identified is to "select the appropriate implementations of products that are purchased" and to "filter the set of available products that a subscriber can discover." Ex. 1001 ('790 pat.), 7:39-45.

A product catalog includes "descriptions of all published items of content (products)" and references to "at least one implementation 57 of that product. *Id.*, 9:37-40. Multiple implementations of items may be published on the download manager, and each may be "designed for a different specific client device or set of client devices." *Id.*, 9:44-48.

The Challenged Claims of the '790 Patent are directed to methods and systems that receive and store multiple items of content that may be made available to subscribers' wireless communication devices. At least one of the implementations of the items of content is received and stored in multiple "implementations," where different implementations correspond to different device capabilities. A product catalog is maintained. The product catalog contains descriptions of items of content and includes a reference to each implementation of the items. According to certain claims (e.g., claims 2 and 9), a request is received from a wireless device, and in response to the request a portion of the product catalog is selected and presented to the subscriber based on the device capabilities. The catalog, as presented to the subscriber, provides only a single description of each item in the portion, regardless of the number of implementations there are of each item.

B. Prosecution History

The '790 patent was issued based on U.S. Patent Application 10/600,746 (the "'746 application"). The '790 patent claims the benefit of four earlier-filed provisional applications, each of which was filed on June 28, 2002. Ex. 1001 ('790 pat.), cover.

The '746 application was filed with 11 method claims. Ex. 1003 (File History), 55-53. In the first Office Action, the examiner rejected claims 1-4 and 9, but objected to claims 10 and 11 and indicated that claims 5-8 were allowable. Ex. 1003 (File History), 21-23. Claims 1-4 and 9 were rejected as being anticipated by either U.S. Patent No. 6,912,385 to Namba et al. and U.S. Patent Application Publication 2003/0060188 to Gidron et al. *Id.*, 22-23. The Office Action merely states that "[c]laims 5-8 are allowed," and "[c]laims 10 and 11 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all limitations of the base claim and any intervening claims." Ex. 1003 (File History), 23.

In response to the Office Action, the applicants canceled claims 1-4, amended their claims such that new independent claims 12 and 13 [issued claims 8 and 9] "include limitations substantially similar to those in claims 5 and 6," which were issued as claims 1 and 2, respectively. *Id.*, 4, 16-17.

All remaining claims were then allowed. The examiner indicated that the reasons for allowance was that the prior art did not disclose "a method and system of accessing content on a wireless communication device, that specifically includes ***receiving and storing a plurality of different implementations of the items of content***" or "maintaining a catalog describing the items of content." Ex. 1003 (File History), 3. "No obvious combination of references found would have taught one of ordinary skill in the art to make and use applicant's method and system as claimed." *Id.*

III. THE PRIOR ART REFERENCES, ARGUMENTS, AND EVIDENCE PRESENT A SUBSTANTIAL NEW QUESTION OF PATENTABILITY

As shown below, Requester submits that the prior art references raise a new "substantial question of patentability" because "the teaching of the (prior art) patents and printed publications is such that a reasonable examiner would consider the teaching to be important in deciding whether or not the claim is patentable." *See* MPEP § 2242.

While the original Examiner was unable to locate prior art that received and stored a plurality of different implementations of items of content or maintaining a catalog describing the items of content, the prior art presented in this Request shows that these features were known to those skilled in the art before the earliest possible effective priority date. Indeed, the art presented in this Request shows that there was considerable research into techniques of transcoding data to allow access by a wide variety of devices with different capabilities including mobile devices. Moreover, the use of product catalogs to provide users with access to content from multiple content providers was known to those skilled in the art as a convenient way to increase consumer interest in digital content like audio and video content.

The references relied upon in this Request are new; the references relied upon herein were not previously considered; the "same question of patentability as to the claim has not been decided by the Office in an earlier concluded examination or review of the patent" at least because none of the art referenced in this request was before the Office during prosecution of the '790 patent or during a prior post-grant proceeding challenging any claim of the '790 patent, any of which that are known to Requester have been listed below in Section V, *infra*.

Reexamination of the Challenged Claims is requested in view of the following prior art references:

Exhibit 1004: U.S. Patent Application Publication No. 2002/0078178 A1 to Senoh ("Senoh"): Senoh is a prior art printed publication and published United States Patent Application. *See* Ex. 1004 (Senoh), cover. Senoh was filed in the United States on August 27, 2001 and published on June 20, 2002. Senoh is thus prior art under pre-AIA 35 U.S.C. §§ 102(a) and (e).

Exhibit 1005: U.S. Patent No. 6,035,339 to Agraharam et al. ("Agraharam"): Agraharam is a prior art patent that was filed in the United States on March 13, 1997 and issued as a patent on March 7, 2000. *See* Ex. 1005 (Agraharm), cover. Agraharam is thus prior art under pre-AIA 35 U.S.C. §§ 102(a), (b), and (e).

Exhibit 1006: U.S. Patent No. 6,421,726 to Kenner et al. ("Kenner"): Kenner is a prior art patent that was filed in the United States on March 1, 1998 and claims the benefit of an earlier-filed provisional application, which was filed on March 14, 1997. Ex. 1006 (Kenner), cover. Kenner issued as a patent on July 16, 2002. Kenner is thus prior art under per-AIA 35 U.S.C. § 102(e).

Exhibit 1007: U.S. Patent No. 6,345,279 to Li et al. ("Li"): Li is a prior art patent that was filed in the United States on April 23, 1999 and issued as a patent on February 5, 2002. Ex. 1007 (Li), cover. Li is thus prior art under pre-AIA 35 U.S.C. §§ 102(a) and (e).

A. SNQ1: Senoh in view of Agraharam Renders Claims 1 and 8 Obvious and Presents a Substantial New Question of Patentability

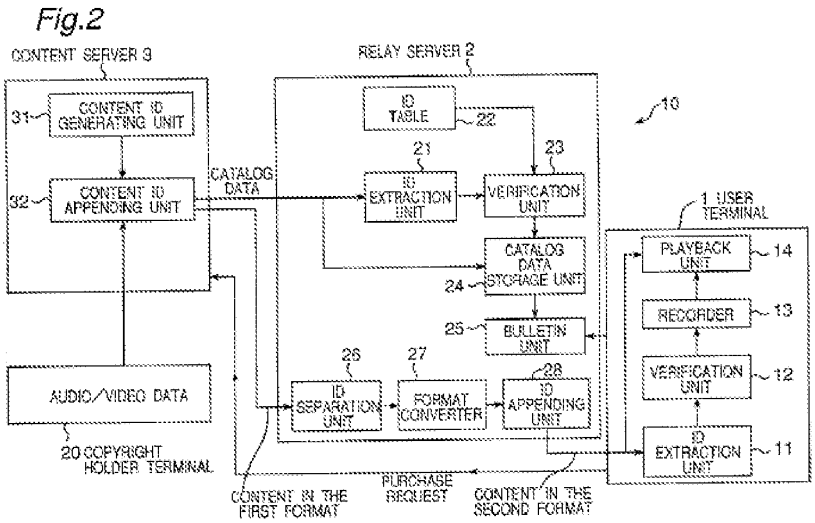
1. Overview of Senoh (Ex. 1004)

Senoh discloses a system and method for content distribution over a network which permits distribution "in a format enabling viewing and enjoyment at the user terminal." Ex. 1004 (Senoh), Abstract. Senoh explains that in a conventional system "the content owner loads a catalog of the available content onto a web site and solicits users wanting the content." Ex. 1004 (Senoh), ¶[0004]. The user can then purchase the content. *Id.* One problem with this conventional system is that "when the specifications of the distributed content differ from the specifications of the content that is viewable on the user's terminal or monitor," the user will be "unable to enjoy the content." *Id.*, ¶[0008]. This could happen, for example, when the content is distributed in high-definition TV format, but the user terminal can only display standard-definition content. *Id.* Senoh further explains that a catalog including content previews—whether that be audio or video—are

received from content providers and are stored and made accessible to users. Ex. 1004, ¶¶[0043]-[0045]. These content previews are pertinent to the challenge to the independent claims of the '790 patent presented in this Request.

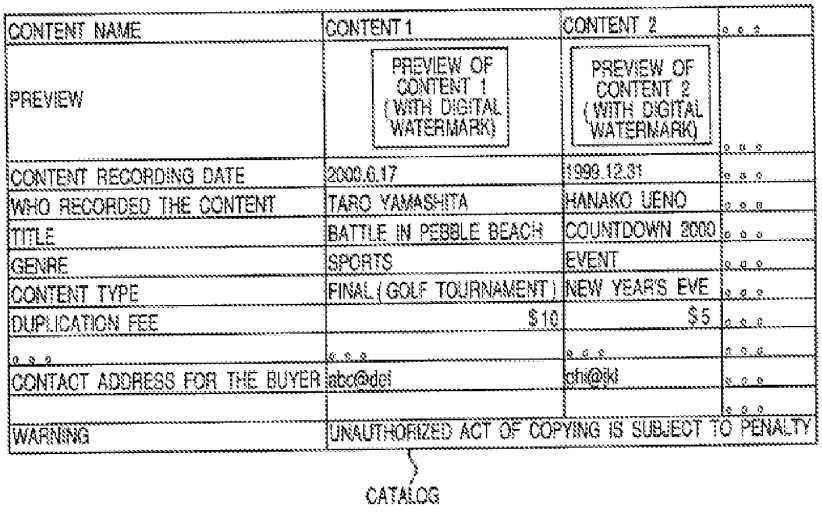
Senoh's "content distribution system" includes a user terminal, relay server, and content server. *Id.*, ¶[0029]. Of course, although one terminal is described explicitly, "plural user terminals can be connected." *Id.*

The content distribution system is shown in detail in Senoh's Figure 2 (reproduced below).



Ex. 1004 (Senoh), FIG. 2. As shown here, the relay server 2 includes a "catalog data storage unit 24," which is used to store data received from content providers about items available for purchase. Ex. 1004 (Senoh), ¶[0046]; *see also id.*, ¶[0044] ("[T]he relay server 2 is a server computer accessible from the network and storing a compiled catalog of plural catalog data entries."). This catalog data is generated by the content provider server and sent to the relay server "in order to market the content to a wider audience." *Id.*, ¶[0043]. Catalog data stored at the relay server can include "previews of content highlights, a copyright notice, the title, content type, price, and where to contact to purchase the content." *Id.*, ¶[0043]. Content previews can be stored in the catalog: "If the content contains video, the relay server 2 preferably enables the content highlights to be previewed. If the content is audio (music), a selection of a particular length could be provided as a preview." *Id.*, ¶[0044]. Figure 4 shows "[a] sample catalog compiling plural catalog data entries."

Fig.4



Ex. 1004 (Senoh), FIG. 4.

The user can view the catalog data from their user terminal, which can be a "cellular phone." Ex. 1004 (Senoh), ¶¶[0045], [0057], [0060], [0074]. After viewing previews of the content, the user can elect to purchase the full-length content by contacting the content server. *Id.*, ¶¶[0045], [0057]. The content server also "requests the format supported by the user terminal 1 for viewing the content." *Id.*, ¶[0057]. Senoh explains that the term "viewable" means "that the user terminal 1 supports the format in which the content will be reproduced, or can display the content at the performance of the output display (the display performance of the monitor) of the user terminal 1." Ex. 1004 (Senoh), ¶[0059].

The POSITA would have recognized that Senoh's technique of sending the full-length content to the relay sever, transcoding it and sending it to the user terminal would not have been efficient for use with Senoh's video previews, which are stored as part of the catalog on the relay server and thus would have looked to a solution in which transcoded versions of the content were stored at the server that receives the request for the content. Ex. 1002 (Reddy Decl.), ¶¶95, 101, 133. This would have led the POSITA to look to other techniques to tailor Senoh's catalog previews to a diverse set of wireless communication devices, as explained below.

2. Overview of Agaharam (Ex. 1005)

Agraharam describes a "network information delivery system" that "automatically

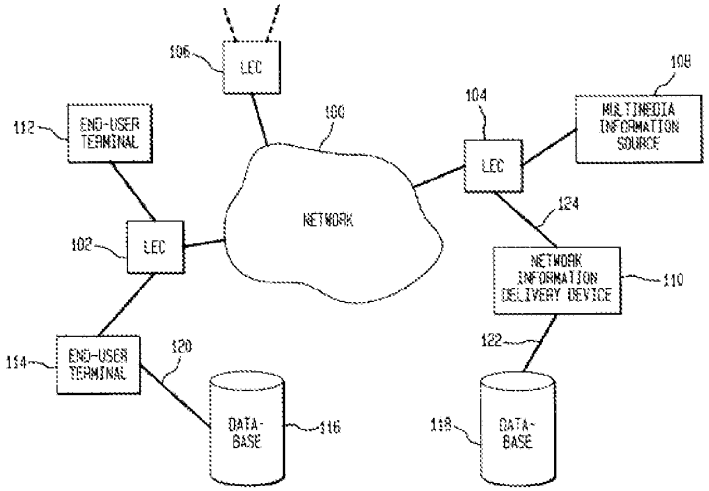
determines end-user information output requirements based on predetermined data corresponding to each requesting end-user terminal." Ex. 1005 (Agraharam), Abstract. Agraharam explains that prior art techniques required a content provider to solicit information about the user terminal capabilities via a menu. *Id.*, 1:11-14. After receiving the information from the user, "if choices are available," the requested content will be delivered to the user in the most compatible pre-formatted form. *Id.*, 1:20-23. But requiring the user to declare the user terminal capabilities was "very inconvenient," and it may exceed the technical sophistication of the end-user. *Id.*, 1:24-28. "Thus, there is a need to provide a method and apparatus to more conveniently determine the user terminal capabilities and to deliver information so that the user terminal capabilities may be most effectively used." *Id.*, 1:31-35.

Agraharam thus proposes an "information delivery system that automatically determines end-user information output requirements based on predetermined data corresponding to each requesting end-user terminal" based on the contents of an "end-user profile" that is stored in a database. Ex. 1005 (Agraharam), 1:38-44.

Agraharam teaches that the content can be pre-formatted into a number of different formats for delivery to the user's terminal. Ex. 1005 (Agraharam), 1:56-60 ("The information to be delivered to end-users may be pre-formatted into predetermined formats. The predetermined formats may be determined based on how often a particular format of the information is requested and characteristics of the information.").

Figure 1 illustrates a network according to Agraharam:

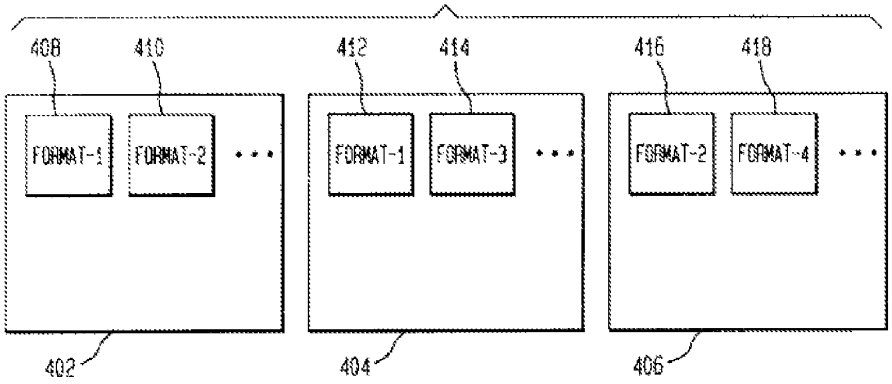
FIG. 1



Ex. 1005 (Agraharam), FIG. 1, 2:26-30. The network can include a wireless network. *Id.*, 2:30-33. "When an end-user using the end-user terminal 114 requests information such as multimedia information from the network information delivery device 110, the network information delivery device 110 first searches the contents of database 118 to determine information output requirements corresponding to the end-user terminal 114." Ex. 1005 (Agraharam), 2:43-48. Based on the requirements, the multimedia data can be packaged and delivered according to the requirements of the end-user's terminal. *Id.*, 2:52-58.

Because end-users buy their equipment on the open market, "end-user terminal requirements can be grouped which allows information such as multimedia information to be preformatted into predetermined formats," which allows for "efficient delivery to the end-user." Ex. 1005 (Agraharam), 4:39-43. Agraharam's Figure 4 shows "multimedia information 402, 404 and 406 being formatted in a plurality of formats such as format-1 to format-4," which can be for example, AVI or QuickTime formats. *Id.*, 4:44-49. Besides the pre-formatted data, data may also be formatted "on-the-fly" to ensure optimal information delivery to certain terminals, thus showing that a POSITA would have found it beneficial to use both static and dynamic transcoding (i.e., transcoding before data is requested and transcoding data as needed) in the same system. *Id.*, 4:49-57; Ex. 1002, ¶¶44, 98.

FIG. 4



Ex. 1005 (Agraharam), FIG. 4.

3. Motivation to Combine Senoh and Agraharam

As explained in detail in Appendix A, the subject matter of claims 1 and 8 would have been obvious based on the combination of Senoh and Agraharam. Specifically, while Senoh describes

a product catalog that includes numerous items of content such as previews of video and/or audio, *see* Ex. 1004 (Senoh), ¶[0044], Senoh does not describe how to ensure that the previews can be viewed or otherwise provided to the user when different devices having different capabilities are used to access the product catalog. Ex. 1002 (Reddy Decl.), ¶¶79, 92-93. Indeed, this particular problem of selecting an appropriate version—which would have been recognized by the POSITA—is unaddressed by Senoh's teachings. *Id.* Thus, Senoh does not disclose the claimed steps of ***receiving a plurality of different implementations of at least one of the items of content, where each implementation of any given item of content correspondents to a different set of device capabilities*** or maintaining a product catalog that includes ***in association with each item of content, a reference to each implementation of said item of content***. Nor does Senoh disclose a distribution manager that performs this functionality.

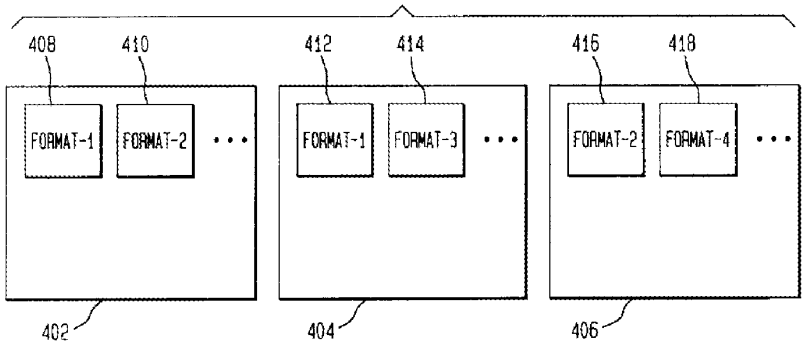
An efficient solution to the problem of ensuring Senoh's catalog previews are provided to devices having different capabilities is provided by Agraharam and renders the claimed subject matter obvious. Specifically, Agraharam explains that it is efficient to store various implementations of content encoded in different formats in a repository so that it can be provided to different devices in accordance with the capabilities of the devices. *See, e.g.*, Ex. 1005 (Agraharam), 4:39-43 ("Based on parameters such as most often requested information and specific characteristics of the information to be formatted, information may be formatted into predetermined formats for efficient delivery to the end-user."), 7:30-34 ("[T]he network information delivery device 110 may maintain a repository of information received from information sources such as information source 108. The formats of the information in the repository may be stored in deliverable formats . . . ."). Agraharam explains that

> Figure 4 shows multimedia information 402, 404 and 406 formatted in a plurality of formats such as format-1 to format-4. Format-1 to format-4 may be formats such as "Audio Video Interleave" (AVI) (Microsoft's 'Video for Windows' standard) or "QuickTime." Thus, as shown in FIG. 4, multimedia information 402 is formatted in at least format-1 408 and format-2 410; multimedia information 404 is formatted in at least format-1 412 and format-3 414 and multimedia information 406 is formatted in at least format-2 416 and format-4 418. Cases that require formats other than the predetermined formats may be handled by formatting the information "on-the-fly" to ensure optimal information delivery to, and reproduction by the end-user terminal 114.

Ex. 1005 (Agraharam), 4:44-57. The different items of content disclosed by Agraharam are shown

as 402, 404, and 406, and the different implementations are shown as "Format-1" through "Format-4" (408, 410, 412, 414, 416, and 418), as illustrated below:

FIG. 4



Id., FIG. 4.

These different items of information and their respective implementations "from information sources such as information source 108 may be deposited in the information delivery database" maintained by the information delivery device 110, thereby reducing network traffic. Ex. 1005 (Agraharam), 4:60-67. These different implementations represent "predetermined formats" and are provided to the user terminals based on the capabilities of the end-user terminals. *See* Ex. 1005, 4:35-39 ("Because end-users obtain end-user terminal capabilities by purchasing equipment that is available on the market, end-user terminal requirements can be grouped which allows information such as multimedia information to be preformatted into predetermined formats."). Thus, the different implementations of the items of content described by Agraharam correspond to different sets of device capabilities associated with different user terminals. Ex. 1002 (Reddy Decl.), ¶83.

It would have been obvious to modify Senoh's catalog such that it received a plurality of different implementations of at least one of the items of content, where each implementation of any given item of content corresponds to a different set of device capabilities for several reasons.

First, POSITAs knew that different devices have different capabilities to view multimedia content and that content like Senoh's previews needed to be delivered to devices in a format that the devices could interpret and display or playback. Ex. 1002 (Reddy Decl.), ¶39-44, 92; Ex. 1004 (Senoh), ¶[0008] ("A problem arises . . . when the specifications of the distributed content differ from the specifications of content that is viewable on the user's terminal or monitor, resulting in the user being unable to enjoy the content."); Ex. 1005 (Agraharam), ("[I]f none of the

predetermined formats are suitable for information reproduction by the user terminal, the user terminal reproduces the information in an undesirable manner."). A POSITA would have been motivated to perform a step of receiving preview data in different implementations corresponding to different devices that access Senoh's catalog, and storing that data with other catalog data at the relay server, so that a wide variety of devices can preview the content from the catalog, thus further disseminating the content to a variety of users, as desired by Senoh. Ex. 1004 (Senoh), ¶[0043] (explaining that the catalog is for marketing "content to a wider audience"); Ex. 1002 (Reddy Decl.), ¶94.

Second, POSITAs knew that content creators wanted to have control over the presentation of different versions of their content to ensure that they displayed the way that they wanted them to display. Ex. 1002 (Reddy Decl.), ¶96 (discussing Ex. 1008 (Britton), p.156 ("The primary advantages of static transcoding are quality of presentation and performance.[] Each page is constructed by a human designer, generally working with tools that show how the application will look or sound and thus allowing the presentation to be hand-tailored for each environment.")). Thus, to provide content creators the ability to have control over the appearance of different implementations the POSITA would have seen a benefit to having the content server maintain different, preformatted implementations of the previews and provide those to Senoh's relay server to market the content. Ex. 1002 (Reddy Decl.), ¶96; Ex. 1008 (Britton), p.156.

Third, POSITAs also knew that latency in viewing content on the Web affected the user experience. Ex. 1002 (Reddy Decl), ¶97. For example, if the product catalog loads slowly, this may give the end-user the perception that quality is bad, or at least may frustrate the end-user. *Id.* Thus, a POSITA would have been encouraged to ensure that the product catalog loaded on the user's device quickly, while providing an experience that engaged the user. Ex. 1002 (Reddy Decl.), ¶97. Transcoding the content into different implementations before the content was requested by a user was a known way to reduce latency, particularly in cases in which resource-intensive encoding for audio or video was to be performed. *Id.*, ¶97. This was recognized by those in the art before 2002. *See, e.g.*, Ex. 1007 (Li), 3:8-10 ("Thus, the invention can handle media items such as video and audio which are difficult to handle in conventional proxies. This off-line transcoding also leads to lower response latencies than proxies."). A POSITA would have recognized that if the catalog previews were stored at the relay and transcoded on the fly, potentially many different items would need to be transcoded to be viewed, thus increasing the

load time of the catalog itself, to the detriment of the user experience—potentially costing a sale. Ex. 1002 (Reddy Decl.), ¶[97. And, if the catalog previews were stored at content servers, a POSITA would have realized that the process of fetching numerous catalog previews from numerous sources would also decrease latency and it would have been inconsistent with the concept of storing catalog data at the relay server. Ex. 1002 (Reddy Decl.), ¶97; Ex. 1004 (Senoh), ¶¶[0032] (copyright holder terminal 20 and content server 3 could be the same computer), [0035] (each copyright holder is assigned a unique copyright holder identifier), [0054] (copyright holder identifier added to catalog data before it is sent to the relay server), FIG. 5 (showing multiple copyright holder IDs, meaning that the ID table 22 in the relay server identifies content from multiple copyright holders and content server/copyright holder terminals).

Fourth, storing multiple implementations of an item of content (previews) is one of a finite number of predictable solutions available to the POSITA for enabling content to be tailored to the user terminals requesting Senoh's previews. Ex. 1002 (Reddy Decl.), ¶97. Indeed, besides receiving and storing different implementations of items of content, one implementation could be received and transcoded at the relay server; implementations may be transcoded on the fly from a single implementation, or, contrary to Senoh's teachings, the catalog content could be kept at content servers and either transcoded there statically or dynamically. *Id.*. These solutions all had predictable results as the concepts of "static" transcoding and "dynamic" transcoding were discussed in the literature and had known implications. *See, e.g.*, Ex. 1008, pp.154-157.

Applying Agraharam's technique of encoding different implementations of items of content and storing them in a database/repository at an information delivery device 110 to the storage of previews in Senoh's relay server would have merely applied a known technique to Senoh's known system, which was ready for improvement. Ex. 1002 (Reddy Decl.), ¶99. This would have furthered Senoh's goal of marketing content from content providers to "a wider audience." Ex. 1004 (Senoh), ¶[0043]; Ex. 1002 (Reddy Decl.), ¶94. As mentioned above, Agraharam provides a known solution to a problem apparent in Senoh's catalog system—namely that the catalog previews would be viewable on only certain terminals because they were not transcoded into different formats for a variety of user terminals. Ex. 1002 (Reddy Decl.), ¶¶99-100. Applying Agraharam's technique to Senohs' previews to transcode the data into different formats for different terminal capabilities would have merely yielded the predictable results of better ensuring that user terminals could view the preview content on their terminals and support

a range of terminal types and capabilities. *Id.* The POSITA would have had a reasonable expectation of succeeding in combining the teachings of Agraharam and Senoh to provide for receipt and storage of multiple implementations of Senoh's catalog previews because it provides a known, simple technique to provide multimedia content to diverse device types in an efficient manner. Ex. 1002 (Reddy Decl.), ¶101.

When implementing the combined Senoh-Agraharam system, the POSITA would also have found it obvious to include ***a reference to each implementation of said item of content*** based on the combined teachings of Senoh and Agraharam. Ex. 1002 (Reddy Decl), ¶¶102-104. Because a POSITA would have found it obvious to receive and store multiple implementations of previews at the relay server, the POSITA would have recognized that there needed to be a way to retrieve the implementation and insert it into the product catalog being viewed by a particular user termina. Ex. 1002 (Reddy Decl), ¶102. The POSITA would have found it obvious to include a reference to each implementation of each item of content in Senoh's product catalog because it would have allowed the resulting system to provide the desired content to the user terminal in an appropriate format and would have allowed Senoh's relay server and catalog to provide the appropriate implementation. *Id.*, ¶103. The POSITA would have been motivated to associate references to the stored implementations of the previews because it would have allowed the Senoh-Agraharam system to provide the content to the end-user in the appropriate format in a structured manner in the product catalog. *Id.*, ¶104. The POSITA would have expected to succeed in implementing the combined Senoh-Agraharam system with the claimed reference because such references allowed access to stored content and were used to access databases and retrieve content long before the '790 patent. *Id.*, ¶104.

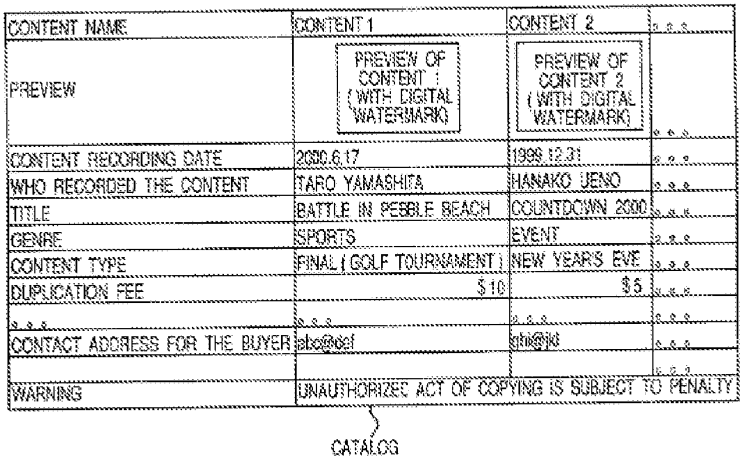
4. Senoh in view of Agraharam Presents a SNQ

This combination of references teaches subject matter that goes to the heart of the reasons that the claims were deemed allowable—namely the receipt and storage of multiple implementations of items of content and making items of content available to subscribers via a product catalog that contains descriptions of such items of content. *See supra* §II.B.

The Examiner did not have the teachings of Agraharam to consider when determining that the prior art did not teach "a method and system of accessing content on a wireless communication device, that specifically includes *receiving and storing a plurality of different implementations of*

the items of content," Ex. 1003 (File History), 43. As explained above, Agraharam teaches creating multiple implementations of items of content for viewing on user terminals with different capabilities. *Supra* §III.A.2. Moreover, the Examiner did not have the teachings of Senoh when concluding that the prior art did not disclose "maintaining a catalog describing the items of content." Ex. 1003 (File History), 43. This is illustrated in Senoh, for example, at Figure 4:

Fig.4



Ex. 1004 (Senoh), FIG. 4; ¶[0024] ("FIG. 4 is an example of a catalog containing plural catalog data entries.").

As explained above and demonstrated in further detail herein, *infra* §IV and in Appendix A, claims 1 and 8 would have been obvious over the combination of Senoh and Agraharam and should not have issued. Therefore, Senoh and Agraharam present a substantial new question of patentability that should be resolved through reexamination.

B. SNQ2: Senoh in view of Kenner Renders Claims 1-2, 4, and 8-9 Obvious and Presents a Substantial New Question of Patentability

1. Overview of Senoh (Ex. 1004)

An overview of the relevant teachings of Senoh is discussed above and is not repeated here in the interest of brevity. *Supra* §III.A..

2. Overview of Kenner (Ex. 1006)

Kenner describes "[a] system and method for the selection and retrieval of various types of video data from distributed delivery sites," which "maintain[] copies of the data in several

alternative file formats." Ex. 1007 (Kenner), Abstract. "The appropriate file format is automatically selected based on the capabilities of a user terminal making a request for data." *Id.*

Kenner explains that the Web "has begun to host highly sophisticated types of multimedia content, such as audio and video data, and computer software," which have "extremely high storage and bandwidth requirements." Ex. 1007 (Kenner), 1:56-59. Compression is used to reduce the data requirements. *Id.*, 1:60-2:3. There are various available compression formats. *Id.*, 1:67-2:3. To decompress a file compressed in a particular format, a specific codec is usually needed. *Id.*, 2:4-10 ("[A] single CODEC program can only recognize and decompress a single compression format."). "When a video clip is stored for transmission in a format which can be decompressed by the CODEC at a user terminal, delivery of the video clip to the user can proceed smoothly." *Id.*, 2:11-14. But, "when a service begins to make video clips available over the Internet, it is more likely that the video clips will be requested by a non-subscribing user whose multimedia terminal does not have the service provider's preferred CODEC." *Id.*, 2:19-24. This can lead the user to need to search for the correct CODEC and install it, which "can be difficult, time-consuming, or inconvenient . . . ." *Id.*, 2:26-32.

Kenner proposes a solution to allow the user device to access video clips using a codec installed on the user terminal. For example, Kenner explains that "a video clip is stored in a number of different formats at individual delivery sites connected to the Internet." Ex. 1007 (Kenner), 7:28-30. The terminal determines which codecs are installed and requests a video clip stored in the appropriate format. *Id.*, 7:37-40.

Kenner Figure 1 shows "an illustrative network topology of a system according to the invention including multiple users and multiple content providers." Ex. 1007 (Kenner), 7:49-51.

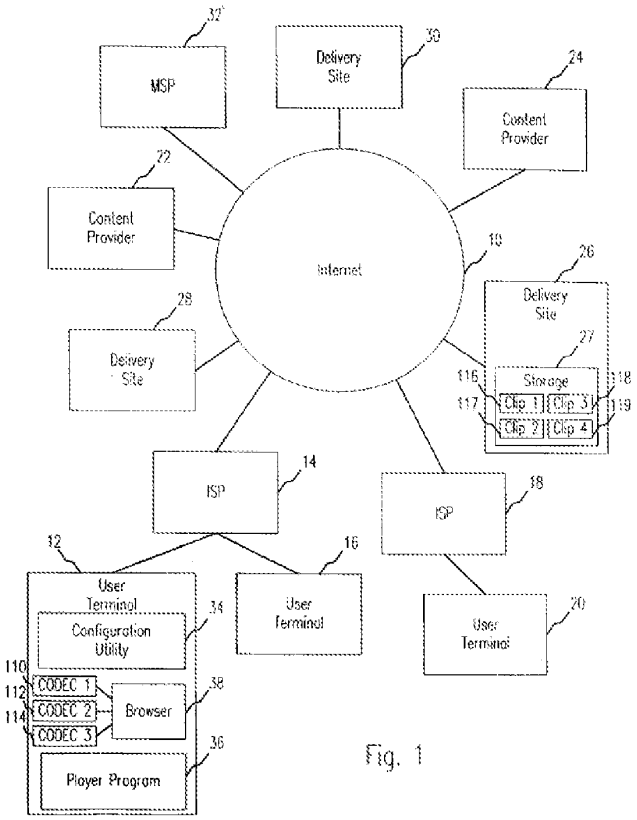


Fig. 1

Ex. 1007 (Kenner), FIG. 1. The delivery site (26) "includes a storage module 27 for storing content such as audio/video clips." *Id.*, 8:45-46. The format selection aspect of Kenner's technique "attempts to identify one o the video clips 116-119 as being in a preferred format that is both stored in the storage module 127 (FIG. 1) and supported by one of the CODECs (110-114) (FIG. 1)." Ex. 1007 (Kenner), 18:20-24.

Kenner explains that a web page can include an embedded reference to a video clip, and may also include an embedded software program. *Id.*, 18:18-24. When the web page is loaded, the program executes and provides a prioritized order of preferred CODECs for accessing the video. *Id.*, 18:36-42.

> If one of the preferred CODECs is installed (step 126), a URL is created from the storage location of the video clip (step 128). For example, such a created URL might be 'http://www.deliverysite.com/clips/watchme". Note that the created URL does not have a format type extension. The created URL is then modified (step 130) by appending a format type extension (e.g. '.mpg' for MPEG-formatted clips, or '.avi' for Microsoft Video for

> Windows-formatted clips) to the location of the video clip. The format type extension used depends on the selected CODEC. The resulting URL (e.g., 'http://www.deliverysite.com/clips/watchme.mpg') uniquely specifies a video clip file in a format recognized by the preferred CODEC installed on the user terminal. This URL is then transmitted to the delivery site specified by the URL, and the clip is downloaded (step 132) and played (step 134). When the video clip file is received, the browser automatically invokes the proper CODEC for its display.

Ex. 1007 (Kenner), 18:48-65.

3. Motivation to Combine Senoh and Kenner

As explained in detail in Appendix B, the subject matter of the claims for which reexamination is requested would have been obvious based on the combination of Senoh and Kenner. Specifically, while Senoh describes a product catalog that includes numerous items of content such as previews of video and/or audio, *see* Ex. 1004 (Senoh), ¶[0044], Senoh does not describe how to ensure that the previews can be viewed or otherwise provided to the user when different devices having different capabilities are used to access the product catalog. Ex. 1002 (Reddy Decl.), ¶117, 131. Indeed, this particular problem of selecting an appropriate version—which would have been recognized by the POSITA—is unaddressed by Senoh's teachings. *Id.* Thus, Senoh does not disclose the claimed steps of ***receiving [and storing] a plurality of different implementations of at least one of the items of content, where each implementation of any given item of content correspondents to a different set of device capabilities*** or maintaining a product catalog that includes ***in association with each item of content, a reference to each implementation of said item of content***. Nor does Senoh disclose a download manager that performs this functionality.

Kenner provides a mechanism for storing multimedia content at a server which hosts a webpage in which the content is embedded and which ensures that the end-user's terminal can play the content back. Ex. 1002 (Reddy), ¶63, 118-120. Kenner explains that servers can store "a plurality of video clips in different formats." Ex. 1006 (Kenner), 18:8-11. In the context of Senoh's catalog, the POSITA would have understood that the first step in viewing the catalog included loading a web page such that a browser or other software on the user terminal could view the catalog data. Ex. 1002 (Reddy Decl.), ¶135. As illustrated in Senoh's FIG. 4, the webpage would include one or more links to audio or video content in the form of previews of the items of content.

See Ex. 1004 (Senoh), FIG. 4. Loading a webpage with embedded video data is also described by Kenner. See Ex. 1006 (Kenner), 18:32-33 ("First, the Web page containing the video clip is loaded by the user terminal (step 120)."). To ensure that the user terminal's browser can view the preview (e.g., video or audio), a POSITA would have found it obvious to employ Kenner's embedded script, which "specifies a sequence of preferred CODECs and corresponding video clip format types." Ex. 1006 (Kenner), 18:33-39; Ex. 1002 (Reddy Decl.), ¶136.. Based on the execution of this script, "a URL is created from the storage location of the video clip" on the server. *Id.*, 18:48-50. Then, the appropriate file format extension is appended to it to allow the identification of a format of the file that can be played back on the user terminal. *Id.*, 18:51-61 ("Note that the created URL does not have a format type extension. The created URL is then modified (step 130) by appending a format type extension (e.g. ".mpg" for MPEG-formatted clips, or ".avi" for Microsoft Video for Windows-formatted clips) to the location of the video clip. The format type extension used depends on the selected CODEC. The resulting URL (e.g. "http://www.deliverysite.com/clips/watchme.mpg") uniquely specifies a video clip file in a format recognized by the preferred CODEC installed on the user terminal."). Thus, Kenner describes a technique that includes receiving and storing a plurality of different implementations (e.g., .mpg and .avi versions of the same video content), where each implementation corresponds to a different set of device capabilities—namely the installed CODEC. Ex. 1002 (Reddy), ¶¶120-121. Additionally, Kenner discloses or renders obvious including a reference to each implementation of said item of content in association with each item of content in the product catalog through its disclosure of URLs and directories on the server identified by the URL, which by its nature provides a reference to the files—each implementation of the video—stored in the directory. Ex. 1002 (Reddy), ¶¶125-126, 144.

The POSITA would have found it obvious to modify Senoh using Kenner's techniques because a POSITA would have looked for a technique to ensure that the previews served to the user terminal could be decoded by the terminal because an appropriate CODEC was installed on the user terminal; this would have allowed the user to view or listen to the preview. Ex. 1002 (Reddy Decl.), ¶132. The POSITA would have found a solution to this need in Kenner. Ex. 1002 (Reddy Decl.), ¶133. A POSITA would have looked to Kenner for several reasons.

First, Kenner provides a simple technique using traditional HTTP protocols and Internet programming to identify which CODECs are installed on a user terminal and uses those techniques

and tools to server the correct versions of content to a user terminal so that it can be conveyed to the subscriber. Ex. 1002 (Reddy Decl.), ¶¶134-136.

Second, POSITAs knew that different devices have different capabilities to view multimedia content and that content like Senoh's previews needed to be delivered to devices in a format that the devices could interpret and display or playback. Ex. 1002 (Reddy Decl.), ¶131; Ex. 1004 (Senoh), ¶[0008] ("A problem arises . . . when the specifications of the distributed content differ from the specifications of content that is viewable on the user's terminal or monitor, resulting in the user being unable to enjoy the content."). And, when the user terminal lacks the correct software (i.e., CODEC) for playing content, they may find it difficult, inconvenient, or time-consuming to download. Ex. 1006 (Kenner), 2:19-32. A POSITA would have been motivated to perform a step of receiving preview data in different implementations corresponding to different device capabilities for the various devices that access Senoh's catalog so that a wide variety of devices can preview the content from the catalog using CODECs installed on the terminals. Ex. 1004 (Senoh), ¶[0043] (explaining that the catalog is for marketing "content to a wider audience"); Ex. 1002 (Reddy Decl.), ¶132.

Third, POSITAs knew that content creators wanted to have control over the presentation of different versions of their content to ensure that they displayed the way that they wanted them to display. Ex. 1002 (Reddy Decl.), ¶138 (citing Ex. 1008 (Britton), p.156 ("The primary advantages of static transcoding are quality of presentation and performance.[] Each page is constructed by a human designer, generally working with tools that show how the application will look or sound and thus allowing the presentation to be hand-tailored for each environment.")). Thus, to provide content creators the ability to have control over the appearance of different implementations the POSITA would have seen a benefit to having the content server maintain different, preformatted implementations of the previews and provide those to Senoh's relay server to market the content. Ex. 1002 (Reddy Decl.), ¶138; Ex. 1008 (Britton), p.156.

Fourth, POSITAs also knew that latency in viewing content on the Web affected the user experience. Ex. 1002 (Reddy Decl), ¶137. For example, if the product catalog loads slowly, this may give the end-user the perception that quality is bad, or at least may frustrate the end-user. *Id.* Thus, a POSITA would have been encouraged to ensure that the product catalog loaded on the user's device quickly, while providing an experience that engaged the user. Ex. 1002 (Reddy Decl.), ¶137. Transcoding the content into different implementations before the content was

requested by a user was a known way to reduce latency, particularly in cases in which resource-intensive encoding for audio or video was to be performed. *Id.*, ¶137. This was recognized by those in the art before 2002. *See, e.g.*, Ex. 1007 (Li), 3:8-10 ("Thus, the invention can handle media items such as video and audio which are difficult to handle in conventional proxies. This off-line transcoding also leads to lower response latencies than proxies."). A POSITA would have recognized that if the catalog previews were stored at the relay and transcoded on the fly, potentially many different items would need to be transcoded to be viewed, thus increasing the load time of the catalog itself, to the detriment of the user experience—potentially costing a sale. Ex. 1002 (Reddy Decl.), ¶137. And, if the catalog previews were stored at content servers, a POSITA would have realized that the process of fetching numerous catalog previews from numerous sources would also decrease latency and it would have been inconsistent with the concept of storing catalog data at the relay server. Ex. 1004 (Senoh), ¶¶[0032] (copyright holder terminal 20 and content server 2 could be the same computer), [0035] (each copyright holder is assigned a unique copyright holder identifier), [0054] (copyright holder identifier added to catalog data before it is sent to the relay server), FIG. 5 (showing multiple copyright holder IDs, meaning that the ID table 22 in the relay server identifies content from multiple copyright holders and content server/copyright holder terminals).

Fifth, storing multiple implementations of an item of content (previews) is one of a finite number of predictable solutions available to the POSITA for enabling content to be tailored to the user terminals requesting Senoh's previews. Ex. 1002 (Reddy Decl.), ¶138. Indeed, besides receiving and storing different implementations of items of content, one implementation could be received and transcoded at the relay server; implementations may be transcoded on the fly from a single implementation, or, contrary to Senoh's teachings, the catalog content could be kept at content servers and either transcoded there statically or dynamically. *Id.*. These solutions all had predictable results as the concepts of "static" transcoding and "dynamic" transcoding were discussed in the literature and had known implications. *See, e.g.*, Ex. 1008, pp.154-157.Thus, a POSITA would have found it obvious to use Kenner's system and methods for retrieving content of a particular format keyed to the device capabilities of the requesting device in connection with Senoh's catalog including previews such as video or audio. As explained above, Senoh teaches an online catalog for browsing multimedia content. Ex. 1004 (Senoh), ¶¶[0043]-[0044]. The catalog can include previews of the audio or video. *Id.*, ¶[0044]. Yet, Senoh does not explain how to better

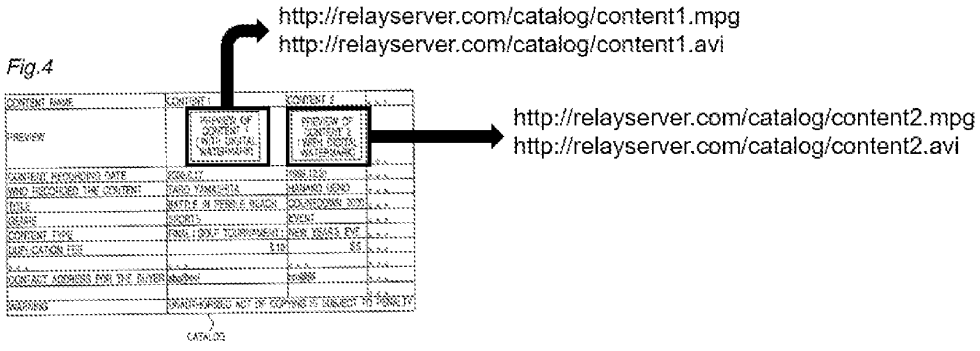
ensure that the multimedia previews could be viewed on the user terminal. Thus Senoh does not disclose a way to ensure that the previews sent to a user's terminal, such as a wireless communication device, would actually be seen on the user terminal or rendered in the best format for the device. Ex. 1002 (Reddy), ¶131. A POSITA would have been motivated to look to Kenner for the reasons discussed above. The POSITA would have been motivated to use the techniques disclosed in Kenner with the catalog of Senoh to address these shortcomings because it would have allowed the preview content to be played by various user terminals having different capabilities (i.e., installed CODECs) through the automatic selection of content that can be played by the terminal. Ex. 1002 (Reddy Decl.), ¶132, 135, 140. This would have minimized user frustration in either not being able to view certain content or having to locate and install a particular CODEC (if possible) to play the one version of content stored at Senoh's relay server. Ex. 1002 (Reddy Decl.), ¶139. The use of Kenner's known technique to allow the system to automatically correlate pre-stored video having particular formats with user terminals having the installed CODEC software to decode and play that content would have merely applied a known technique to Senoh's catalog and would have yielded only predictable results of allowing a diverse set of devices with different CODECs to view the previews of the content items through the catalog site. Ex. 1002 (Reddy Decl.), ¶140. The POSITA would have looked to Kenner to provide a technique that allowed the system to correlate between installed CODECs on client terminals and available implementations of the items of content. Ex. 1002 (Reddy Decl.), ¶141. Because the interrelated techniques were taught in detail in the prior art, and the art was predictable and well-understood, the POSITA would have had a reasonable expectation of success in combining Senoh's relay server and catalog with Kenner's technique for ensuring that user terminals could view video files. Ex. 1002 (Reddy Decl.), ¶143.

Additionally, Senoh does not explicitly teach that the product catalog ***includes, in association with each item of digital content, a reference to each implementation of said item of digital content***. But this feature would have been obvious over the combined teachings of Senoh and Kenner. The POSITA would have found it obvious to store multiple implementations (formats) of Senoh's preview content at Senoh's relay server based on the teachings of Kenner. In doing so, a POSITA would have further found it obvious to include ***a reference to each implementation of said item of digital content*** through use of a directory structure on the relay server. Ex. 1002 (Reddy Decl.), ¶¶124-127, 144. As taught by Kenner, if an acceptable codec is

installed on the end-user's terminal, "a URL is created from the storage location of the video clip (step 128)." Ex. 1006 (Kenner), 18:48-50. "For example, such a created URL might be "http://deliverysite.com/clips/watchme." *Id.*, 18:48-51. But, this URL is missing the "format type extension," such as ".mpg" or ".avi." *Id.*, 18:50-56.

In implementing Senoh's product catalog, including, for example, previews of video and/or audio content using Kenner's techniques, each preview would be stored in a particular directory associated with that preview (e.g., /clips/watchme in the context of Kenner's example). Ex. 1002 (Reddy Decl.), ¶125. The directory structure including /clips/watchme" is a reference to each implementation of the digital content called "watchme" because it unambiguously identifies all the files stored in that directory with the name "watchme." Ex. 1002 (Reddy Decl.), ¶125. In other words, /clips/watchme is the directory in which each implementation of watchme is stored including watchme.mpg and watchme.avi. *Id.*

In implementing the combined Senoh-Kenner system, to select one of the versions of the preview, the POSITA would have used Kenner's explicit reference to each of the implementations stored in a directory including all versions of the particular preview (e.g., /clips/watchme according to Kenner's example). Ex. 1002 (Reddy Decl.), ¶¶125-126, 144. In a combined Senoh-Kenner system, the POSITA would have understood that references such as "catalog/content1" and "catalog/content2" provided a reference to each implementation of the item of digital content, thus allowing the specific implementations required by the client terminal to be accessed by appending the correct file extension to the name. Ex. 1002 (Reddy Decl.), ¶126.



For these reasons, the POSITA would have found it obvious to modify Senoh in view of Kenner so that Senoh received and stored different implementations of at least one preview in Senoh's catalog where the different implementations correspond to different device capabilities of

user terminals and Senoh's catalog including references to the different implementations to allow them to be identified and selected for provision to a requesting user terminal. Ex. 1002 (Reddy Decl.), ¶144.

4. Senoh in view of Kenner Presents a SNQ

This combination of references teaches subject matter that goes to the heart of the reasons that the claims were deemed allowable—namely the receipt and storage of multiple implementations of items of content and making items of content available to subscribers via a product catalog that contains descriptions of such items of content. *See supra* §II.B.

The examiner did not have the teachings of Senoh or Kenner when concluding that the prior art did not teach "a method and system of accessing content on a wireless communication device, that specifically includes *receiving and storing a plurality of different implementations of the items of content*," Ex. 1003 (File History), 43. As explained above, Kenner teaches creating multiple implementations of items of content (e.g., file.mpg, file.avi) for viewing on user terminals with different capabilities (e.g., installed CODECs). *Supra* §III.B.2. Moreover, the Examiner did not have the teachings of Senoh when concluding that the prior art did not disclose "maintaining a catalog describing the items of content." Ex. 1003 (File History), 43. This is illustrated in Senoh, for example, at Figure 4:

Fig.4

CONTENT NAME	CONTENT 1	CONTENT 2	...
PREVIEW	PREVIEW OF CONTENT 1 (WITH DIGITAL WATERMARK)	PREVIEW OF CONTENT 2 (WITH DIGITAL WATERMARK)	...
CONTENT RECORDING DATE	2000.6.17	1999.12.31	...
WHO RECORDED THE CONTENT	TARO YAMASHITA	HANAKO UENO	...
TITLE	BATTLE IN PEBBLE BEACH	COUNTDOWN 2000	...
GENRE	SPORTS	EVENT	...
CONTENT TYPE	FINAL (GOLF TOURNAMENT)	NEW YEAR'S EVE	...
DUPLICATION FEE	$10	$5	...
...	...	...	...
CONTACT ADDRESS FOR THE BUYER	abc@def	ghi@jkl	...
			...
WARNING	UNAUTHORIZED ACT OF COPYING IS SUBJECT TO PENALTY		

CATALOG

Ex. 1004 (Senoh), FIG. 4; ¶[0024] ("FIG. 4 is an example of a catalog containing plural catalog data entries.").

As explained above and demonstrated in further detail herein, *infra* §IV.B and in Appendix B, claims 1-2, 4, and 8-9 would have been obvious over the combination of Senoh and Kenner and should not have issued. Therefore, Senoh and Kenner present a substantial new question of patentability that should be resolved through reexamination.

C. SNQ3: Senoh in view of Li Renders Claims 1-2, 4, and 8-9 Obvious and Presents a Substantial New Question of Patentability

1. Overview of Senoh (Ex. 1004)

An overview of the relevant teachings of Senoh is discussed above. *Supra* §III.A.1.

2. Overview of Li (Ex. 1007)

Li describes a technique for optimizing the delivery of various types of multimedia content including "video, images, graphics, text and audio." Ex. 1007, 1:24-26. Li explains that a "wide variety of devices over a wide range of network environments" may access multimedia information, and that this includes devices like "personal computers on a local area network (LAN), personal digital assistants (PDAs) on dial-up modems and smart cellular phones," which have different screen sizes, resolution, color depth, network bandwidth, and computing power. Ex. 1007, 1:26-36. As Li explains, universal multimedia delivery methods "need to account for the composite nature of Web documents, and the variety of client platform capabilities, user interests, network constraints and authoring policies." *Id.*, 1:37-42.

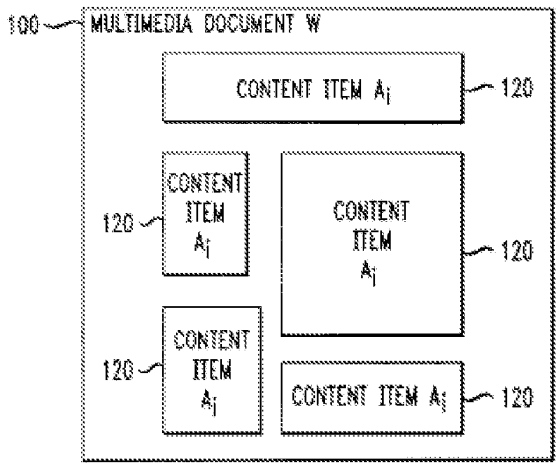
Li thus "relates to delivery of multimedia content to client devices, and more particularly, to methods and apparatus for adapting such multimedia content for diverse client devices." *Id.*, 1:18-21. Li teaches "[a] method of adapting multimedia content to a client device wherein the multimedia content includes one or more items and the client device has capabilities and resources associated therewith . . . ." Ex. 1007, Abstract. The multimedia content is transcoded "into a plurality of transcoded content versions, wherein the plurality of transcoded content versions have different modalities and resolutions associated therewith." *Id.* When a transcoded version of the content is not compatible with the client device's capabilities, it is "filtered out." *Id.*; *see also id.*, 6:50-56, 10:63-67.

Content may be initially authored as text or an image. Ex. 1007, 2:21-23. Next, each content item is "transcoded into multiple resolution and modality versions so that they can be rendered on different devices." *Id.*, 2:23-25. According to one example, "a video item is transcoded into a selected set of images so that it can be rendered on a device not capable of displaying video." *Id.*, 2:25-28. "Each version of a content item requires different resources from the client device." *Id.*, 2:29-30. "If the client has limited resources, e.g., such as a PDA or pager, some of the content items may not get any resources assigned and thus not be delivered to the client." *Id.*, 2:34-39.

Li describes the use of a data structure called an "InfoPyramid," which represents different transcoded versions of the content and the use of InfoPyramids to select appropriate content for the user terminal using filtering and resource allocation processes. *Id.*, 2:40-48, 4:49-67. Using Li's techniques the "content author" can "edit and replace transcoded versions of content items generated by the automated transcoding systems," thus giving the content owner control over customization and the overall content—an advantage sought by content creators. Ex. 1007 (Li), 2:56-62. To enable more efficient handling of audio and video content, "the invention permits the transcoded versions of the content items to be generated prior to any requests." *Id.*, 3:4-6. "This off-line transcoding also leads to lower response latencies than proxies." *Id.*, 3:8-10.

Li's Figure 1 shows "an example of a multimedia document." Ex. 1007, 4:4-5.

FIG. 1

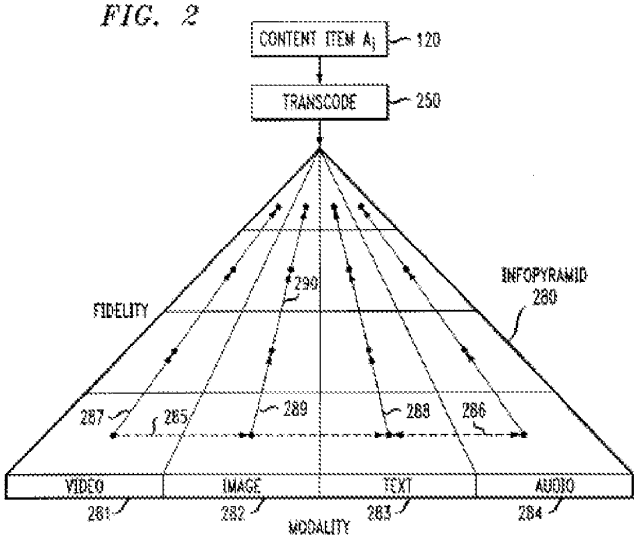


Ex. 1007, FIG. 1. As explained in Li and shown in Figure 1, the document is identified as 100 and includes content items Ai identified as number 120. Ex. 1007, 4:4-14. "Each content item Ai, can

be an atomic unit of media such as, for example, an image." *Id.*, 4:14-16.

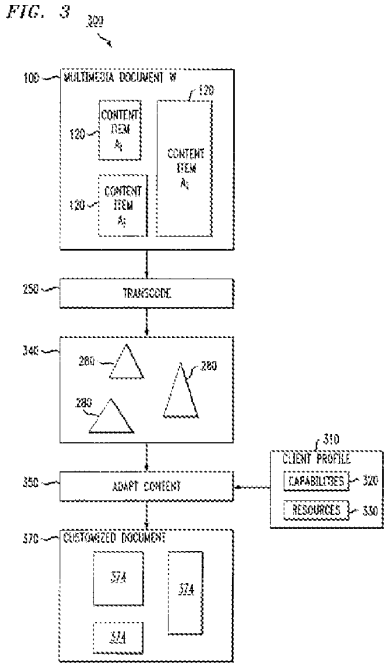
An InfoPyramid is shown in Figure 2 (below). Ex. 1007, 4:20-23.

FIG. 2



Ex. 1007, FIG. 2. "A content item 120 is transcoded . . . into an InfoPyramid 280" which is shown here as having several different resolutions and modalities. *Id.*, 4:21-26; *id.*, 5:6-8 ("The transcoding process 250 populates the InfoPyramid 280 structure with multi-resolution, multi-modal versions of the content item . . . ."). "A specific version of a multimedia item can be referred to be one of the cells." *Id.*, 4:66-67.

FIG. 3



Li's provides "a flow chart of a method 300 of adapting multimedia document 100 to a client device according to the invention" as Figure 3 (see right). Ex. 1007, 5:63-65, FIG. 3. The client device provides a client profile 310 to the system and this client profile specifies capabilities and resources. *Id.*, 5:65-66, 6:8-9. Capabilities include the ability to display image, video, and audio replay capabilities, and color capabilities. *Id.*, 6:9-19. Resources include things like screen size, bandwidth, and storage capacity. *Id.*, 6:19-29. The client device provides a profile through any one of a "number of mechanisms," including the User-Agent field

in an HTTP request as one example. Ex. 1007, 7:30-31. Content items 120 are transcoded into different versions (modalities and fidelities or qualities) and stored in a structure called an InfoPyramid, as discussed above. Using the client device profile, the correct modality and fidelity of the content item can be chosen from the InfoPyramids and unsupported content is filtered out such that it is not provided to the user terminals. *Id.*, 6:42-67; FIG. 3.

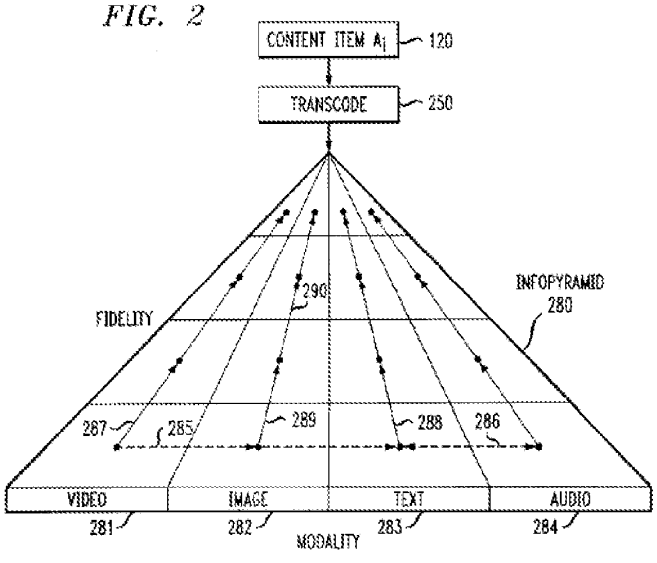
3. Motivation to Combine Senoh and Li

As explained in detail in Appendix C, the subject matter of the claims for which reexamination is requested would have been obvious based on the combination of Senoh and Li.

A POSITA would have understood that while Senoh teaches a product catalog that includes information about multiple items of content including text and video clips that are provided from content creators, *see* Ex. 1004 (Senoh), ¶¶[0043]-[0045], FIG. 4; Ex. 1002 (Reddy Decl., ¶¶190-191, 210, Senoh does not describe techniques for ensuring that the catalog previews can be accessed by devices with different device capabilities to ensure that the content provided from the catalog can be viewed on the client devices, Ex. 1002 (Reddy Decl.), ¶207. Therefore, the POSITA would have looked at prior art solutions to make the catalog as accessible to end-users as possible to achieve the goal of allowing the content to be marketed to "a wider audience" as taught by Senoh. Ex. 1004 (Senoh), ¶[0043]; Ex. 1002, ¶207.

A POSITA would have found a solution in Li. Specifically, the POSITA would have seen that Li teaches a way of transcoding content into numerous different formats to create what Li calls "InfoPyramids." Ex. 1007 (Li), 2:40-47, 5:66-6:2 ("As shown in FIG 2, the content items 120 of a multimedia document 100 are transcoded (250) into multiple modality and fidelity versions to generate a set of InfoPyramids 280.").

FIG. 2



Therefore, Li teaches transcoding content items into ***a plurality of different implementations of at least one of the items of content, where each implementation of any given item of content corresponds to a different set of device capabilities***. As taught in Li, based on the client device capabilities and resources provided in a client device profile, an appropriate implementation of the item of content can be selected for the device, e.g., "all versions that are in video modality can be filtered out if the device is not capable of displaying video" and "all versions that are color images can be filtered out for a device that has only a black and white or gray-level screen." Ex. 1007 (Li), 6:52-56.

The POSITA would have looked to Li to improve Senoh's catalog display techniques for several reasons. First, a POSITA knew that different devices have different capabilities to view multimedia content and that content like Senoh's previews needed to be delivered to devices in a format that the devices could interpret and display or playback. Ex. 1002 (Reddy Decl.), ¶39-44, 205; Ex. 1004 (Senoh), ¶[0008] ("A problem arises . . . when the specifications of the distributed content differ from the specifications of content that is viewable on the user's terminal or monitor, resulting in the user being unable to enjoy the content."). And, when the user terminal lacks the correct software (i.e., CODEC) for playing content, they may find it difficult, inconvenient, or time-consuming to download. Ex. 1006 (Kenner), 2:19-32. A POSITA would have been motivated to perform a step of receiving preview data in different implementations corresponding to different device capabilities for the various devices that access Senoh's catalog so that a wide variety of devices can preview the content from the catalog using CODECs installed on the terminals. Ex. 1004 (Senoh), ¶[0043] (explaining that the catalog is for marketing "content to a wider audience"); Ex. 1002 (Reddy Decl.), ¶207.

Second, POSITAs knew that content creators wanted to have control over the presentation of different versions of their content to ensure that they displayed the way that they wanted them to display. Ex. 1002 (Reddy Decl.), ¶209 (discussing Ex. 1008 (Britton), p.156 ("The primary advantages of static transcoding are quality of presentation and performance.[] Each page is constructed by a human designer, generally working with tools that show how the application will look or sound and thus allowing the presentation to be hand-tailored for each environment.")). Thus, to provide content creators the ability to have control over the appearance of different implementations the POSITA would have seen a benefit to having the content server maintain different, preformatted implementations of the previews and provide those to Senoh's relay server

to market the content. Ex. 1002 (Reddy Decl.), ¶209; Ex. 1008 (Britton), p.156.

Third, POSITAs also knew that latency in viewing content on the Web affected the user experience. Ex. 1002 (Reddy Decl), ¶210. For example, if the product catalog loads slowly, this may give the end-user the perception that quality is bad, or at least may frustrate the end-user. *Id.* Thus, a POSITA would have been encouraged to ensure that the product catalog loaded on the user's device quickly, while providing an experience that engaged the user. Ex. 1002 (Reddy Decl.), ¶¶210, 215. Transcoding the content into different implementations before the content was requested by a user was a known way to reduce latency, particularly in cases in which resource-intensive encoding for audio or video was to be performed. *Id.*, ¶¶210, 215. This was recognized by those in the art before 2002. *See, e.g.*, Ex. 1007 (Li), 3:8-10 ("Thus, the invention can handle media items such as video and audio which are difficult to handle in conventional proxies. This off-line transcoding also leads to lower response latencies than proxies."). A POSITA would have recognized that if the catalog previews were stored at the relay and transcoded on the fly, potentially many different items would need to be transcoded to be viewed, thus increasing the load time of the catalog itself, to the detriment of the user experience—potentially costing a sale. Ex. 1002 (Reddy Decl.), ¶210. And, if the catalog previews were stored at content servers, a POSITA would have realized that the process of fetching numerous catalog previews from numerous sources would also decrease latency, Ex. 1002 (Reddy Decl.), ¶¶210, 215, and it would have been inconsistent with Senoh's concept of storing catalog data at the relay server, Ex. 1004 (Senoh), ¶¶[0032] (copyright holder terminal 20 and content server 2 could be the same computer), [0035] (each copyright holder is assigned a unique copyright holder identifier), [0054] (copyright holder identifier added to catalog data before it is sent to the relay server), FIG. 5 (showing multiple copyright holder IDs, meaning that the ID table 22 in the relay server identifies content from multiple copyright holders and content server/copyright holder terminals).

Fourth, storing multiple implementations of an item of content (previews) is one of a finite number of predictable solutions available to the POSITA for enabling content to be tailored to the user terminals requesting Senoh's previews. Ex. 1002 (Reddy Decl.), ¶211. Indeed, besides receiving and storing different implementations of items of content, one implementation could be received and transcoded at the relay server; implementations may be transcoded on the fly from a single implementation, or, contrary to Senoh's teachings, the catalog content could be kept at content servers and either transcoded there statically or dynamically. *Id.*. These solutions all had

predictable results as the concepts of "static" transcoding and "dynamic" transcoding were discussed in the literature and had known implications. *See, e.g.*, Ex. 1008, pp.154-157.

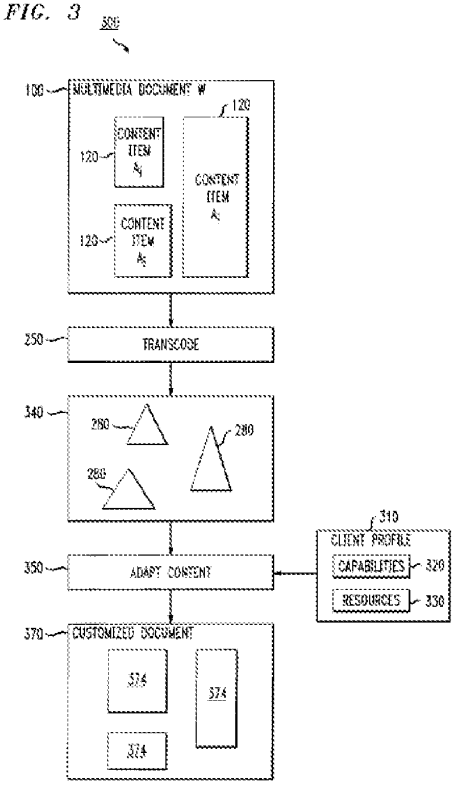
It would have been obvious to transcode content in Senoh's content servers to create InfoPyramids using techniques taught in Li so that InfoPyramids could be received and stored at relay servers to enable selection of the best implementation of the content to present to a particular user terminal based on a device's capabilities as taught in Li. Ex. 1002 (Reddy), ¶¶212-213. A POSITA would have found the inclusion of Li's known technique would have improved Senoh's catalog system in the same way that improved Li's system over prior art techniques for allowing various devices to view multimedia content on a Web page that is tailored to the device. *Id.*, ¶212. Applying the Li techniques to content for Senoh's catalog would have allowed consumers of video or audio content to browse Senoh's catalog for content using a variety of devices with a variety of capabilities thus accomplishing the intended goal of Senoh's product catalog—i.e., "to market the content to a wider audience." Ex. 1004 (Senoh), ¶[0043].

Moreover, applying Li's technique for adapting content to a variety of user terminals including "PDAs" and "smart cellular phones," Ex. 1007 (Li), 1:31-36, would have merely applied Li's known technique for transcoding various types of content such as Senoh's text and video and audio clips into different fidelity and/or modalities to allow as many users to view the content as possible from their mobile devices, *id.*, 4:58-67. Additionally, applying Li's known technique to Senoh's system to allow the relay server to receive items of information in multiple different implementations tailored for a variety of different user terminals would have improved Senoh's catalog by enabling it to be viewed on a wide variety of different end user devices. Ex. 1002 (Reddy Decl.), ¶¶212-213. Thus, applying Li to Senoh's catalog technique would have improved Senoh in the same way as it improved Li over the prior art. Ex. (Reddy Decl.) 1002, ¶¶212, 215. At the very least, applying Li's techniques on the data to be served to the relay server from Senoh's content servers for use in Senoh's catalogs would have improved upon Senoh in a predictable manner—by allowing catalog content to be tailored for many different types of devices so that the content could be marketed to wider audiences. Ex. 1002 (Reddy Decl.), ¶215. The POSITA would have reasonably expected to succeed in combining Senoh and Li because Li's transcoding techniques were known and predictable and combining them with Senoh would have merely combined the known transcoding techniques with known and Internet-based technologies to provide Senoh's product catalog to user devices. Ex. 1002 (Reddy Decl.), ¶216.

Additionally, Senoh does not explicitly teach that the product catalog ***includes, in association with each item of digital content, a reference to each implementation of said item of digital content***. But, this feature would have been obvious over the combined teachings of Senoh and Li. As explained in connection with *Limitation [1Aii]*, above, it would have been obvious to store multiple implementations (formats) of Senoh's catalog content at Senoh's relay server in data structures such as Li's InfoPyramids based on Li's teachings. In doing so, a POSITA would have understood that ***a reference to each implementation of said item of digital content*** was needed to identify the specific InfoPyramid for a specific item of information. More specifically, a POSITA would have understood that there needed to be a reference from the content items—e.g., Senoh's previews—and the InfoPyramid that defines various implementations of that content item stored at the relay server. Ex. 1002 (Reddy Decl.), ¶199-202, 217. Such a reference is needed to tie the items (previews) in the catalog to the InfoPyramid including the implementations and without such a reference the system would not be able to correlate items to InfoPyramids. Ex. 1002 (Reddy Decl.), ¶202.

When a document (e.g., Senoh's product catalog) includes multiple items of information with multiple components, each of the items can be represented in its own InfoPyramid (280), as indicated in Li's FIG. 3 (right).

FIG. 3



Thus, a document such as Senoh's product catalog includes a number of content items (e.g., text, video previews) that each provide a ***product catalog*** which includes ***in association with each item of content*** (e.g., "Content 1's" preview) ***a reference to each implementation of said item of content***—i.e., a reference to the particular InfoPyramid in the combined Senoh-Li system that includes the "multiple representations of a multimedia item . . . organized into a pyramid-like data structure, as illustrated in FIG. 2." Ex. 1007 (Li), 4:58-61. These different implementations are further described by Li as follows: "The cells of the pyramid correspond to different

representations of the objects using different modalities such as, for example, video 281, image 282, audio 283 and text 284, and fidelities such as in the range of full-resolution (bottom of the pyramid) to low-resolution (top of the pyramid). A specific version of a multimedia item can be referred to by one of the cells." Ex. 1007 (Li), 4:61-67. The POSITA would have understood that in implementing Senoh's product catalog using Li's InfoPyramids, each item of information—e.g., preview of Content 1 or a preview of Content 2—would be associated with multiple implementations of that item as defined in the InfoPyramid and that the process of selecting which, if any, implementation is to be provided to the user terminal required use of a ***reference to*** the specific InfoPyramid—i.e., to ***each implementation of said item of content*** to allow selection of the appropriate item of content for the end user terminal. Ex. 1002 (Reddy Decl.), ¶202.

For these reasons, the POSITA would have found it obvious to modify Senoh in view of Li so that Senoh received and stored different implementations of previews in InfoPyramids such that an implementation would be selected to match the device capabilities, and including a reference in Senoh's catalog to each implementation of the previews stored in an InfoPyramid for to properly associate the preview with the aspect of the product catalog including the particular preview of the content. Ex. 1002 (Reddy Decl.), ¶217.

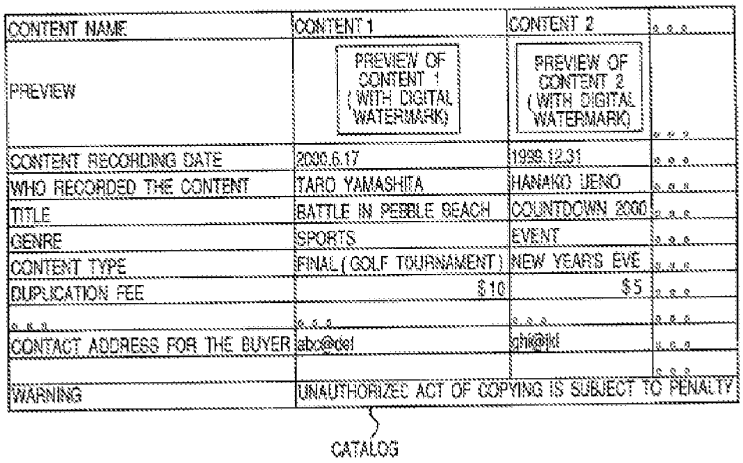
4. Senoh in view of Li Presents a SNQ

This combination of references teaches subject matter that goes to the heart of the reasons that the claims were deemed allowable—namely the receipt and storage of multiple implementations of items of content and making items of content available to subscribers via a product catalog that contains descriptions of such items of content. *See supra* §II.B.

The examiner did not have the teachings of Senoh or Li when concluding that the prior art did not teach "a method and system of accessing content on a wireless communication device, that specifically includes *receiving and storing a plurality of different implementations of the items of content*," Ex. 1003 (File History), 43. As explained above, Li teaches creating multiple implementations of items of content in terms of both modalities and fidelities and storing them in an InfoPyramid, which allows for the storage of multiple implementations of content and the selection of an appropriate implementation to be served to the end-user's terminal in response to a request for the content. *Supra* §III.C.2. Moreover, the Examiner did not have the teachings of Senoh when concluding that the prior art did not disclose "maintaining a catalog describing the

items of content." Ex. 1003 (File History), 43. This is illustrated in Senoh, for example, at Figure 4:

Fig.4



Ex. 1004 (Senoh), FIG. 4; ¶[0024] ("FIG. 4 is an example of a catalog containing plural catalog data entries.").

As explained above and demonstrate in further detail herein, *infra* §IV.C and in Appendix C, claims 1, 2, 4, 8, and 9 would have been obvious over the combination of Senoh and Li and should not have issued. Therefore, Senoh and Li present a substantial new question of patentability that should be resolved through reexamination.

IV. DETAILED APPLICATION OF THE PRIOR ART TO EVERY CLAIM FOR WHICH REEXAMINATION IS REQUESTED

A. SNQ1 (Senoh in view of Agraharam; Appendix A)

Senoh in view of Agraharam renders obvious each and every element of claims 1 and 8. For ease of reference, Requester outlines examples from each reference that disclose or render obvious each associated claim limitation below. Further, a framework for a POSITA's background knowledge and motivations to combine are provided by Requester's expert, A.L. Narasimha Reddy, Ph.D (*see* Ex. 1002). A more detailed mapping of SNQ1 is provided in Appendix A.

Claim 1: ***[1P] A method of providing access to content for use on wireless communication devices, the method comprising:*** (Senoh describes ***a method of providing access to content*** by describing a "catalog" including "catalog data" which includes "previews of content highlights" accessible via a "common bulletin board," Ex. 1004 (Senoh), ¶¶[0043]-[0045], and

which can be accessed via a "cellular phone," which is a ***wireless communication device***, *id.*, ¶¶[0060], [0074]; Ex. 1002 (Reddy Decl.), ¶¶71-75); ***[1Ai] receiving and storing a plurality of items of content to be made available for use in wireless communication devices used by a plurality of wireless services subscribers,*** (Senoh describes ***receiving and storing a plurality of items of content*** by explaining that a content server "generates and sends catalog data for the content to the relay server," and that the relay server stores "a compiled catalog of plural catalog data entries," including "preview[s]" or "a selection of a particular length could be provided as a preview" for music content, Ex. 1004 (Senoh), ¶¶[0044]-[0045]; Ex. 1002 (Reddy Decl.), ¶¶76-78; these ***items of content*** are ***to be made available for use in wireless communication devices***, i.e., Senoh's "cellular phones," Ex. 1004 (Senoh), ¶¶[0060], [0074], which can access Senoh's catalog, *id.*, ¶¶[0044]-[0045], and these devices are, or at least obviously would have been ***used by a plurality of wireless subscribers***, Ex. 1002 (Reddy Decl.), ¶78 (citing Ex. 1011, 2:5-7 (describing cellular phone with a "subscriber identity module" (SIM) which identifies a subscriber's device to the network))); ***[1Aii] including receiving a plurality of different implementations of at least one of the items of content, where each implementation of any given item of content corresponds to a different set of device capabilities;*** (Senoh discloses receiving items of content—"content highlights" and "a selection of a particular length provided as a preview," Ex. 1004 (Senoh), ¶[0044]; Agraharam teaches or at least renders obvious ***receiving a plurality of different implementations of at least one of the items of content*** because Agraharam teaches "multimedia information . . . being formatted in a plurality of formats such as format-1 to format-4," Ex. 1005 (Agraharam), 4:44-57, and which "may be deposited in [a] information delivery database," *id.*, 4:60-67; Ex. 1002 (Reddy Decl.), ¶82; Agraharam further teaches ***each implementation of any given item of content corresponds to a different set of device capabilities*** because Agraharam teaches that the "multimedia information" is "preformatted into predetermined formats" and "the network information delivery device 110 can automatically determine the best information delivery parameters required for effective delivery of the information requested by the end-user," Ex. 1005 (Agraharam), 4:27-30, and after receiving a request from a terminal "the controller 302 determines the end-user information output requirements" and "packages the information based on the end-user information output requirements," *id.*, 5:19-24); ***and [1B] maintaining a product catalog containing a description of the items of content, the product catalog including, in association with each item of content, a reference to each implementation of said item of***

content. (Senoh teaches ***maintaining a product catalog*** by explaining that the "relay server 2" stores "a compiled catalog of plural catalog data entries," Ex. 1004 (Senoh), ¶[0044], and the ***product catalog*** contains ***a description of the items of content*** such as previews and text as shown in Senoh's Figure 4, *id.*, FIG. 4; Senoh in view of Agraharam render obvious ***including in association with each item of content, a reference to each implementation of said item of content*** because Senoh's catalog entries would identify the previews—i.e., "multimedia information . . . being formatted in a plurality of formats such as format-1 to format-4," Ex. 1005 (Agraharam), 4:44-57).

Claim 8: ***[8P] A system comprising*** (Senoh discloses ***a system*** because it describes "an electronic distribution system," Ex. 1004 (Senoh), Abstract, FIG. 2); ***[8A] a network interface through which to communicate over a communication network; and*** (Senoh discloses or renders obvious a ***network interface through which to communicate over a communication network*** because it discloses a "relay server" and "content server" which are "connected to a communication network 4, such as the Internet, through which they can communicate with each other," Ex. 1004 (Senoh), ¶[0029], and an POSITA would have known that ***a network interface*** allowed servers to interface with the physical communication medium over which data is transmitted, Ex. 1002 (Reddy Decl.), ¶108); ***[8B] a download manager to*** (Senoh's relay server constitutes a ***download manager*** that performs the claimed functions, Ex. 1004 (Senoh), ¶[0029]; Ex. 1001, 3:66-4:1 (defining download manger); Ex. 1002, ¶109); ***[8Bi] receive and store a plurality of items of content to be made available for use in wireless communication devices used by a plurality of wireless telecommunications subscribers,*** (Senoh describes a download manager that can ***receive and store a plurality of items of content*** by explaining that a content server "generates and sends catalog data for the content to the relay server," and that the relay server stores "a compiled catalog of plural catalog data entries," including "preview[s]" or "a selection of a particular length could be provided as a preview" for music content, Ex. 1004 (Senoh), ¶¶[0044]-[0045]; Ex. 1002 (Reddy Decl.), ¶¶76-78, 110; these ***items of content*** are ***to be made available for use in wireless communication devices***, i.e., Senoh's "cellular phones," Ex. 1004 (Senoh), ¶¶[0060], [0074], which can access Senoh's catalog, *id.*, ¶¶[0044]-[0045], and these devices are, or at least obviously would have been ***used by a plurality of wireless subscribers***, Ex. 1002 (Reddy Decl.), ¶¶76-78, 110 (citing Ex. 1011, 2:5-7 (describing cellular phone with a "subscriber identity module" (SIM) which identifies a subscriber's device to the network))); ***[8Bii]***

including receiving a plurality of different implementations of at least one of the items of content, where each implementation of any given item of content corresponds to a different set of device capabilities; (Senoh discloses receiving items of content—"content highlights" and "a selection of a particular length provided as a preview," Ex. 1004 (Senoh), ¶[0044]; Agraharam teaches or at least renders obvious ***receiving a plurality of different implementations of at least one of the items of content*** because Agraharam teaches "multimedia information . . . being formatted in a plurality of formats such as format-1 to format-4," Ex. 1005 (Agraharam), 4:44-57, and which "may be deposited in [a] information delivery database," *id.*, 4:60-67; Ex. 1002 (Reddy Decl.), ¶¶82, 111; Agraharam further teaches ***each implementation of any given item of content corresponds to a different set of device capabilities*** because Agraharam teaches that the "multimedia information" is "preformatted into predetermined formats" and "the network information delivery device 110 can automatically determine the best information delivery parameters required for effective delivery of the information requested by the end-user," Ex. 1005 (Agraharam), 4:27-30, and after receiving a request from a terminal "the controller 302 determines the end-user information output requirements" and "packages the information based on the end-user information output requirements," *id.*, 5:19-24); ***and [8Biii] maintain a product catalog containing a description of the items of content, the product catalog including, in association with each item of content, a reference to each implementation of said item of content.*** (Senoh teaches ***maintaining a product catalog*** by explaining that the "relay server 2" stores "a compiled catalog of plural catalog data entries," Ex. 1004 (Senoh), ¶[0044], and the ***product catalog*** contains ***a description of the items of content*** such as previews and text as shown in Senoh's Figure 4, *id.*, FIG. 4; Senoh in view of Agraharam render obvious ***including in association with each item of content, a reference to each implementation of said item of content*** because Senoh's catalog entries would identify the previews—i.e., "multimedia information . . . being formatted in a plurality of formats such as format-1 to format-4," Ex. 1005 (Agraharam), 4:44-57).

B. SNQ2 (Senoh in view of Kenner; Appendix B)

Senoh in view of Kenner renders obvious each and every element of claims 1, 2, 4, 8, and 9. For ease of reference, Requester outlines examples from each reference that disclose or render obvious each associated claim limitation below. Further, a framework for a POSITA's background knowledge and motivations to combine are provided by Requester's expert, A.L. Narasimha

Reddy, Ph.D (*see* Ex. 1002). A more detailed mapping of SNQ2 is provided in Appendix B.

Claim 1: ***[1P] A method of providing access to content for use on wireless communication devices, the method comprising:*** (Senoh describes ***a method of providing access to content*** by describing a "catalog" including "catalog data" which includes "previews of content highlights" accessible via a "common bulletin board," Ex. 1004 (Senoh), ¶¶[0043]-[0045], and which can be accessed via a "cellular phone," which is a ***wireless communication device***, *id.*, ¶¶[0060], [0074]; Ex. 1002 (Reddy Decl.), ¶¶71-75, 115)***; [1Ai] receiving and storing a plurality of items of content to be made available for use in wireless communication devices used by a plurality of wireless services subscribers,*** (Senoh describes ***receiving and storing a plurality of items of content*** by explaining that a content server "generates and sends catalog data for the content to the relay server," and that the relay server stores "a compiled catalog of plural catalog data entries," including "preview[s]" or "a selection of a particular length could be provided as a preview" for music content, Ex. 1004 (Senoh), ¶¶[0044]-[0045]; Ex. 1002 (Reddy Decl.), ¶¶76-78, 116; these ***items of content*** are ***to be made available for use in wireless communication devices***, i.e., Senoh's "cellular phones," Ex. 1004 (Senoh), ¶¶[0060], [0074], which can access Senoh's catalog, *id.*, ¶¶[0044]-[0045], and these devices are, or at least obviously would have been ***used by a plurality of wireless subscribers***, Ex. 1002 (Reddy Decl.), ¶¶78, 116 (citing Ex. 1011, 2:5-7 (describing cellular phone with a "subscriber identity module" (SIM) which identifies a subscriber's device to the network))); ***[1Aii] including receiving a plurality of different implementations of at least one of the items of content, where each implementation of any given item of content corresponds to a different set of device capabilities; and*** (Senoh discloses receiving items of content—"content highlights" and "a selection of a particular length provided as a preview," Ex. 1004 (Senoh), ¶[0044]; Kenner teaches or at least renders obvious ***receiving a plurality of different implementations of at least one of the items of content*** by explaining that "a video clip is stored in a number of different compression formats at individual delivery sites connected to the Internet," Ex. 1006 (Kenner), 7:28-30, *see also id.*, 18:6-13 (referring to a "first delivery site 26" that "includes storage for a plurality of video clips in different formats"), and Kenner explains that ***each implementation of any given item of content corresponds to a different set of device capabilities*** because "[t]he appropriate file format is automatically selected based on the capabilities of the user terminal making the request for data," *id.*, at Abstract, and even if Kenner did not disclose "receiving" the implementations, it would have been obvious to receive

them at delivery sites around the Internet, Ex. 1002 (Reddy Decl.), ¶¶118-121); ***[1B] maintaining a product catalog containing a description of the items of content, the product catalog including, in association with each item of content, a reference to each implementation of said item of content.*** (Senoh teaches ***maintaining a product catalog*** by explaining that the "relay server 2" stores "a compiled catalog of plural catalog data entries," Ex. 1004 (Senoh), ¶[0044], and the ***product catalog*** contains ***a description of the items of content*** such as previews and text as shown in Senoh's Figure 4, *id.*, FIG. 4; Senoh in view of Kenner renders obvious ***including, in association with each item of content, a reference to each implementation of said item of content*** because Kenner explains that each implementation is referenced by a directory and file name—a "URL might be "http://deliverysite.com/clips/watchme," which is a reference to each implementation of "watchme" such as watchme.mpg and watchme.avi, Ex. 1006 (Kenner), 18:48-56, and including such references to Senoh's previews in Senoh's catalog stored at the relay server would have been obvious, Ex. 1002 (Reddy Decl.), ¶¶124-126.)

Claim 2: ***[2P] A method of providing access to digital content for use on wireless communication devices, the method comprising:*** (Senoh describes ***a method of providing access to content*** by describing a "catalog" including "catalog data" which includes "previews of content highlights" accessible via a "common bulletin board," Ex. 1004 (Senoh), ¶¶[0043]-[0045], and which can be accessed via a "cellular phone," which is a ***wireless communication device***, *id.*, ¶¶[0060], [0074]; Ex. 1002 (Reddy Decl.), ¶¶71-75, 146); ***[2Ai] receiving and storing in a server system a plurality of items of digital content to be made available for use in wireless communication devices used by a plurality of wireless subscribers,*** (Senoh describes ***receiving and storing a plurality of items of digital content*** by explaining that a content server "generates and sends catalog data for the content to the relay server," and that the relay server—i.e., at least a part of ***a server system***—stores "a compiled catalog of plural catalog data entries," including "preview[s]" or "a selection of a particular length could be provided as a preview" for music content, Ex. 1004 (Senoh), ¶¶[0044]-[0045]; Ex. 1002 (Reddy Decl.), ¶¶76-78, 147; these ***items of digital content*** are ***to be made available for use in wireless communication devices***, i.e., Senoh's "cellular phones," Ex. 1004 (Senoh), ¶¶[0060], [0074], which can access Senoh's catalog, *id.*, ¶¶[0044]-[0045], and these devices are, or at least obviously would have been ***used by a plurality of wireless subscribers***, Ex. 1002 (Reddy Decl.), ¶¶78, 147 (citing Ex. 1011, 2:5-7 (describing cellular phone with a "subscriber identity module" (SIM) which identifies a

subscriber's device to the network))); ***[2Aii] including receiving and storing a plurality of different implementations of at least one of the items of digital content, where each implementation of any given item of digital content corresponds to a different set of device capabilities;*** (Senoh discloses receiving items of content—"content highlights" and "a selection of a particular length provided as a preview," Ex. 1004 (Senoh), ¶[0044]; Kenner teaches or at least renders obvious ***receiving a plurality of different implementations of at least one of the items of digital content*** by explaining that "a video clip is stored in a number of different compression formats at individual delivery sites connected to the Internet," Ex. 1006 (Kenner), 7:28-30, *see also id.*, 18:6-13 (referring to a "first delivery site 26" that "includes storage for a plurality of video clips in different formats"), and Kenner explains that ***each implementation of any given item of digital content corresponds to a different set of device capabilities*** because "[t]he appropriate file format is automatically selected based on the capabilities of the user terminal making the request for data," *id.*, at Abstract, and even if Kenner did not disclose "receiving" the implementations, it would have been obvious to receive them at delivery sites around the Internet, Ex. 1002 (Reddy Decl.), ¶¶¶120-121, 148); ***[2B] operating the server system to maintain a product catalog containing a description of the items of digital content wherein the product catalog includes, in association with each item of digital content, a reference to each implementation of said item of digital content;*** (Senoh teaches operating a "relay server"—i.e., at least a part of ***the server system—to maintain a product catalog*** by explaining that the "relay server 2" stores "a compiled catalog of plural catalog data entries," Ex. 1004 (Senoh), ¶[0044], and the ***product catalog*** contains ***a description of the items of content*** such as previews and text as shown in Senoh's Figure 4, *id.*, FIG. 4; Senoh in view of Kenner renders obvious ***the product catalog includes, in association with each item of digital content, a reference to each implementation of said item of content*** because Kenner explains that each implementation is referenced by a directory and file name—a "URL might be "http://deliverysite.com/clips/watchme," which is a reference to each implementation of "watchme" such as watchme.mpg and watchme.avi, Ex. 1006 (Kenner), 18:48-56, and including such references to Senoh's previews in Senoh's catalog stored at the relay server would have been obvious, Ex. 1002 (Reddy Decl.), ¶125-127, 149.); ***[2C] receiving a request from a wireless device used by one of the subscribers;*** (Senoh in view of Kenner renders obvious ***receiving a request from a wireless device used by one of the subscribers*** because Kenner explains that once the

format type is determined based on the installed CODECs, the "format type extension" is "transmitted to the delivery site specified by the URL," Ex. 1006 (Kenner), 18:61-63; Ex. 1002 (Reddy Decl.), ¶151); ***[2D] in response to the request, selecting a portion of the product catalog to be presented to the subscriber, based on device capabilities of the wireless device used by the subscriber;*** (Senoh and Kenner renders obvious that ***in response to the request***—i.e., a request including the "URL" and "format type extension" taught by Kenner to Senoh's relay server to access previews of content, causes the server select to identify the specific file associated with the URL and "format type extension," which ultimately results in "the clip [being] downloaded (step 132)" to the Senoh's cellular phone, Ex. 1006 (Kenner), 18:61-65; Ex. 1002 (Reddy Decl.), ¶¶153-154; only ***a portion of the product catalog*** is ***presented to the subscriber*** because there are different versions of the videos stored on the relay server, but only one is selected to be served to the client, Ex. 1002 (Reddy Decl.), ¶154, and this is done ***based on the device capabilities of the wireless device used by the subscriber*** because "[t]he appropriate file format is automatically selected based on the capabilities of the user terminal making the request for data," *id.*, at Abstract, and even if Kenner did not disclose "receiving" the implementations, it would have been obvious to receive them at delivery sites around the Internet, Ex. 1002 (Reddy Decl.), ¶154); ***[2E] presenting the selected portion of the product catalog to the subscriber via a wireless network, such that the selection portion, as presented to the subscriber, provides only a single description of each item of digital content in said portion, regardless of the number of implementations of each said item.*** (Senoh in view of Kenner renders obvious ***presenting the selected portion of the product catalog to the subscriber*** because in the selected version of the video (e.g,. .mpg or .avi)—***i.e., the selected portion of the product catalog*** would be presented ***to the subscriber via a wireless network***—i.e., the cellular network in the case of Senoh's cellular phones, Ex. 1004 (Senoh), ¶¶[0060], [0074], such that ***the selected portion, as presented to the subscriber, provides only a single description of each item of digital content in said portion, regardless of the number of implementations of each said item*** because while there may be two implementations—e.g., .avi and .mpg—only a single one is provided along with accompanying text to describe the content even though more than one version is available, Ex. 1002 (Reddy), ¶156).

Claim 4: ***[4P] A method as recited in claim 2, further comprising:*** (Senoh in view of Kenner renders claim 2 obvious as discussed above); ***[4A] receiving from the subscriber a request for one of the items of digital content in said portion of the product catalog;*** (Senoh discloses

receiving from the subscriber a request because it explains that a user can "send[] a purchase request to the content provider . . . ," Ex. 1004, ¶[0057], and the request can be for ***one of the items of digital content in said portion of the product catalog*** because the user can make the selection by viewing "the bulletin board 25 containing catalog data, views previews of content from the catalog data on the bulletin board 25," and may elect to purchase the item of digital content from the catalog by contacting the content provider, Ex. 1004 (Senoh), ¶[0057]); ***[4B] selecting an implementation of the requested item of digital content, based on device capabilities of the wireless device used by the subscriber; and*** (Senoh discloses and renders obvious ***selecting an implementation of the requested item of digital content, based on device capabilities of the wireless device used by the subscriber*** because "[i]f the format of the content sent to the relay server 2 differs from the format required by the user terminal 1, the relay server 2 converts the received format to the format viewable by the user terminal 1, and then transmits the content to the user terminal 1," where "viewable" refers to whether the terminal "supports the format in which the content will be reproduced . . . ." Ex. 1004 (Senoh), ¶[0059]; *see also id.*, ¶¶[0060]-[0061], [0064]); ***[4C] downloading the selected implementation of the item of digital content to the wireless device used by the subscriber.*** (Senoh discloses and renders obvious a step of ***downloading the selected implementation of the item of digital content to the wireless device used by the subscriber*** by explaining that when the content is in the correct format "the relay server 2 simply sends the content directly to the user terminal 1" and when the content is not in the required format "the relay server 2 converts the received format to the format viewable by the user terminal 1, and then transmits the content to the user terminal 1," Ex. 1004 (Senoh), ¶[0059]-[0060]).

Claim 8: ***[8P] A system comprising*** (Senoh discloses ***a system*** because it describes "an electronic distribution system," Ex. 1004 (Senoh), Abstract, FIG. 2)*;* ***[8A] a network interface through which to communicate over a communication network; and*** (Senoh discloses or renders obvious a ***network interface through which to communicate over a communication network*** because it discloses a "relay server" and "content server" which are "connected to a communication network 4, such as the Internet, through which they can communicate with each other," Ex. 1004 (Senoh), ¶[0029], and an POSITA would have known that ***a network interface*** allowed servers to interface with the physical communication medium over which data is transmitted, Ex. 1002 (Reddy Decl.), ¶¶108, 168); ***[8B] a download manager to*** (Senoh's relay

server constitutes a ***download manager*** that performs the claimed functions, Ex. 1004 (Senoh), ¶[0029]; Ex. 1001, 3:66-4:1 (defining download manger); Ex. 1002, ¶¶109, 169)*; **[8Bi] receive and store a plurality of items of content to be made available for use in wireless communication devices used by a plurality of wireless telecommunications subscribers,*** (Senoh describes a download manager that can ***receive and store a plurality of items of content*** by explaining that a content server "generates and sends catalog data for the content to the relay server," and that the relay server stores "a compiled catalog of plural catalog data entries," including "preview[s]" or "a selection of a particular length could be provided as a preview" for music content, Ex. 1004 (Senoh), ¶¶[0044]-[0045]; Ex. 1002 (Reddy Decl.), ¶¶76-77, 170; these ***items of content*** are ***to be made available for use in wireless communication devices***, i.e., Senoh's "cellular phones," Ex. 1004 (Senoh), ¶¶[0060], [0074], which can access Senoh's catalog, *id.*, ¶¶[0044]-[0045], and these devices are, or at least obviously would have been ***used by a plurality of wireless subscribers***, Ex. 1002 (Reddy Decl.), ¶¶78, 170 (citing Ex. 1011, 2:5-7 (describing cellular phone with a "subscriber identity module" (SIM) which identifies a subscriber's device to the network)))*; **[8Bii] including receiving a plurality of different implementations of at least one of the items of content, where each implementation of any given item of content corresponds to a different set of device capabilities; and*** (Senoh discloses receiving items of content—"content highlights" and "a selection of a particular length provided as a preview," Ex. 1004 (Senoh), ¶[0044]; Kenner teaches or at least renders obvious ***receiving a plurality of different implementations of at least one of the items of content*** by explaining that "a video clip is stored in a number of different compression formats at individual delivery sites connected to the Internet," Ex. 1006 (Kenner), 7:28-30, *see also id.*, 18:6-13 (referring to a "first delivery site 26" that "includes storage for a plurality of video clips in different formats"), and Kenner explains that ***each implementation of any given item of content corresponds to a different set of device capabilities*** because "[t]he appropriate file format is automatically selected based on the capabilities of the user terminal making the request for data," *id.*, at Abstract, and even if Kenner did not disclose "receiving" the implementations, it would have been obvious to receive them at delivery sites around the Internet, Ex. 1002 (Reddy Decl.), ¶¶133-138, 171)*; **[8Biii] maintain a product catalog containing a description of the items of content, the product catalog including, in association with each item of content, a reference to each implementation of said item of content.*** (Senoh teaches ***maintaining a product catalog*** by explaining that the "relay server 2" stores "a compiled catalog of plural catalog data entries," Ex.

1004 (Senoh), ¶[0044], and the ***product catalog*** contains ***a description of the items of content*** such as previews and text as shown in Senoh's Figure 4, *id.*, FIG. 4; Senoh in view of Kenner renders obvious ***including, in association with each item of content, a reference to each implementation of said item of content*** because Kenner explains that each implementation is referenced by a directory and file name—a "URL might be "http://deliverysite.com/clips/watchme," which is a reference to each implementation of "watchme" such as watchme.mpg and watchme.avi, Ex. 1006 (Kenner), 18:48-56, and including such references to Senoh's previews in Senoh's catalog stored at the relay server would have been obvious, Ex. 1002 (Reddy Decl.), ¶¶125-127, 144, 172-173.)

Claim 9: ***[9P] A system comprising:*** (Senoh discloses ***a system*** because it describes "an electronic distribution system," Ex. 1004 (Senoh), Abstract, FIG. 2); ***[9A] a processor; and*** (A POSITA would have understood that Senoh discloses a processor because Senoh teaches a "content distribution system 10," including "'relay server 2," and "content server 3," which communicate over a "communication network 4, such as the Internet," Ex. 1004 (Senoh), ¶[0029], data can be converted into formats such as MPEG-2 and MPEG-4, which requires a processor, Ex. 1002 (Reddy Decl.), ¶176, and Senoh explains that the operations can "be written as a computer program causing a computer to execute the various processes," Ex. 1004 (Senoh), ¶[0081]); ***[9B] a storage facility accessible to the processor and containing code which, when executed by the processor, causes the processing system to*** (Senoh discloses or at least renders obvious a ***storage facility accessible to the processor and containing code*** by explaining that "processing operations of the various components . . . can also be written as a computer program" and "recorded to . . flash memory or other semiconductor storage medium," for example, Ex. 1004 (Senoh), ¶[0081], and ***when executed by the processor***, the code ***causes the processing system*** to perform the functions described in the following limitations); ***[9Bi] receive and store a plurality of items of digital content to be made available for use in wireless communication devices used by a plurality of wireless communication subscribers*** (Senoh describes ***receiving and storing a plurality of items of digital content*** by explaining that a content server "generates and sends catalog data for the content to the relay server," and that the relay server—i.e., at least a part of ***a server system***—stores "a compiled catalog of plural catalog data entries," including "preview[s]" or "a selection of a particular length could be provided as a preview" for music content, Ex. 1004 (Senoh), ¶¶[0044]-[0045]; Ex. 1002 (Reddy Decl.), ¶¶ 76-77, 147, 180; these ***items of digital***

content are ***to be made available for use in wireless communication devices***, i.e., Senoh's "cellular phones," Ex. 1004 (Senoh), ¶¶[0060], [0074], which can access Senoh's catalog, *id.*, ¶¶[0044]-[0045], and these devices are, or at least obviously would have been ***used by a plurality of wireless subscribers***, Ex. 1002 (Reddy Decl.), ¶¶78, 170 (citing Ex. 1011, 2:5-7 (describing cellular phone with a "subscriber identity module" (SIM) which identifies a subscriber's device to the network))); ***[9Bii] including receiving and storing a plurality of different implementations of at least one of the items of digital content, where each implementation of any given item of digital content corresponds to a different set of device capabilities;*** (Senoh discloses receiving items of content—"content highlights" and "a selection of a particular length provided as a preview," Ex. 1004 (Senoh), ¶[0044]; Kenner teaches or at least renders obvious ***receiving a plurality of different implementations of at least one of the items of digital content*** by explaining that "a video clip is stored in a number of different compression formats at individual delivery sites connected to the Internet," Ex. 1006 (Kenner), 7:28-30, *see also id.*, 18:6-13 (referring to a "first delivery site 26" that "includes storage for a plurality of video clips in different formats"), and Kenner explains that ***each implementation of any given item of digital content corresponds to a different set of device capabilities*** because "[t]he appropriate file format is automatically selected based on the capabilities of the user terminal making the request for data," *id.*, at Abstract, and even if Kenner did not disclose "receiving" the implementations, it would have been obvious to receive them at delivery sites around the Internet, Ex. 1002 (Reddy Decl.), ¶¶142, 181, 186); ***[9Biii] maintain a product catalog containing a description of the items of digital content, wherein the product catalog includes, in association with each item of digital content, a reference to each implementation of said item of digital content;*** (Senoh teaches ***maintain[ing] a product catalog*** by explaining that the "relay server 2" stores "a compiled catalog of plural catalog data entries," Ex. 1004 (Senoh), ¶[0044], and the ***product catalog*** contains ***a description of the items of content*** such as previews and text as shown in Senoh's Figure 4, *id.*, FIG. 4; Senoh in view of Kenner renders obvious ***the product catalog includes, in association with each item of digital content, a reference to each implementation of said item of content*** because Kenner explains that each implementation is referenced by a directory and file name—a "URL might be "http://deliverysite.com/clips/watchme," which is a reference to each implementation of "watchme" such as watchme.mpg and watchme.avi, Ex. 1006 (Kenner), 18:48-56, and including such references to Senoh's previews in Senoh's catalog stored at the relay server would have been

obvious, Ex. 1002 (Reddy Decl.), ¶¶125-127, 144, 182, 186.); ***[9Biv] receive a request from a wireless device used by one of the subscribers;*** (Senoh in view of Kenner renders obvious code that causes the relay server to ***receive a request from a wireless device used by one of the subscribers*** because Kenner explains that once the format type is determined based on the installed CODECs, the "format type extension" is "transmitted to the delivery site specified by the URL," Ex. 1006 (Kenner), 18:61-63; Ex. 1002 (Reddy Decl.), ¶¶151, 183); ***[9Bv] in response to the request, select a portion of the product catalog to be presented to the subscriber, based on device capabilities of the wireless device used by the subscriber;*** (Senoh and Kenner renders obvious code that ***in response to the request***—i.e., a request including the "URL" and "format type extension" taught by Kenner to Senoh's relay server to access previews of content, causes the server select to identify the specific file associated with the URL and "format type extension," which ultimately results in "the clip [being] downloaded (step 132)" to the Senoh's cellular phone, Ex. 1006 (Kenner), 18:61-65; Ex. 1002 (Reddy Decl.), ¶¶154, 184; only ***a portion of the product catalog*** is ***presented to the subscriber*** because there are different versions of the videos stored on the relay server, but only one is selected to be served to the client, Ex. 1002 (Reddy Decl.), ¶¶154, 184, and this is done ***based on the device capabilities of the wireless device used by the subscriber*** because "[t]he appropriate file format is automatically selected based on the capabilities of the user terminal making the request for data," *id.*, at Abstract) ***and [9Bvi] cause the selected portion of the product catalog to be presented to the subscriber via a wireless telecommunications network, such that the selected portion, as presented to the subscriber, provides only a single description of each item of digital content in said portion, regardless of the number of implementations of each said item.*** (Senoh in view of Kenner renders obvious computer code that causes ***the selected portion of the product catalog to be presented to the subscriber*** because in the selected version of the video (e.g,. .mpg or .avi)—***i.e., the selected portion of the product catalog*** would be presented ***to the subscriber via a wireless network***—i.e., the cellular network in the case of Senoh's cellular phones, Ex. 1004 (Senoh), ¶¶[0060], [0074], such that ***the selected portion, as presented to the subscriber, provides only a single description of each item of digital content in said portion, regardless of the number of implementations of each said item*** because while there may be two implementations—e.g., .avi and .mpg—only a single one is provided along with accompanying text to describe the content even though more than one version is available, Ex. 1002 (Reddy), ¶¶156, 185).

C. SNQ3 (Senoh in view of Li; Appendix C)

Senoh in view of Li renders obvious each and every element of claims 1, 2, 4, 8, and 9. For ease of reference, Requester outlines examples from each reference that disclose or render obvious each associated claim limitation below. Further, a framework for a POSITA's background knowledge and motivations to combine are provided by Requester's expert, A.L. Narasimha Reddy, Ph.D (*see* Ex. 1002). A more detailed mapping of SNQ3 is provided in Appendix C.

Claim 1: ***[1P] A method of providing access to content for use on wireless communication devices, the method comprising:*** (Senoh describes ***a method of providing access to content*** by describing a "catalog" including "catalog data" which includes "previews of content highlights" accessible via a "common bulletin board," Ex. 1004 (Senoh), ¶¶[0043]-[0045], and which can be accessed via a "cellular phone," which is a ***wireless communication device***, *id.*, ¶¶[0060], [0074]; Ex. 1002 (Reddy Decl.), ¶¶73-74, 188); ***[1Ai] receiving and storing a plurality of items of content to be made available for use in wireless communication devices used by a plurality of wireless services subscribers,*** (Senoh describes ***receiving and storing a plurality of items of content*** by explaining that a content server "generates and sends catalog data for the content to the relay server," and that the relay server stores "a compiled catalog of plural catalog data entries," including "preview[s]" or "a selection of a particular length could be provided as a preview" for music content, Ex. 1004 (Senoh), ¶¶[0044]-[0045]; Ex. 1002 (Reddy Decl.), ¶¶76-77, 189; these ***items of content*** are ***to be made available for use in wireless communication devices***, i.e., Senoh's "cellular phones," Ex. 1004 (Senoh), ¶¶[0060], [0074], which can access Senoh's catalog, *id.*, ¶¶[0044]-[0045], and these devices are, or at least obviously would have been ***used by a plurality of wireless subscribers***, Ex. 1002 (Reddy Decl.), ¶¶78, 189 (citing Ex. 1011, 2:5-7 (describing cellular phone with a "subscriber identity module" (SIM) which identifies a subscriber's device to the network))); ***[1Aii] including receiving a plurality of different implementations of at least one of the items of content, where each implementation of any given item of content correspondents to a different set of device capabilities;*** (Senoh discloses receiving items of content—"content highlights" and "a selection of a particular length provided as a preview," Ex. 1004 (Senoh), ¶[0044]; Li teaches storing multimedia content that is transcoded "to optimally match the capabilities of the client device requesting it," Ex. 1007 (Li), 2:19-21, that items of content are "transcoded into multiple resolution and modality versions so that they can be rendered on different devices," *id.*, 2:24-26, and that "the transcoded versions of content items to

be granted prior to any requests," thus allowing the technique to be used efficiently with "media items such as video and audio," *id.*, 3:4-10; it would have been obvious to use Li's techniques at content servers such that multiple implementations of items of content corresponding to different sets of device capabilities are received at Senoh's relay server, Ex. 1002 (Reddy Decl.), ¶190-195, 204, 207, 208-211); ***and [1B] maintaining a product catalog containing a description of the items of content, the product catalog including, in association with each item of content, a reference to each implementation of said item of content.*** (Senoh teaches ***maintaining a product catalog*** by explaining that the "relay server 2" stores "a compiled catalog of plural catalog data entries," Ex. 1004 (Senoh), ¶[0044], and the ***product catalog*** contains ***a description of the items of content*** such as previews and text as shown in Senoh's Figure 4, *id.*, FIG. 4; Senoh in view of Li renders obvious ***including, in association with each item of content, a reference to each implementation of said item of content*** because Li teaches a "multimedia document" with "a number of content items Ai," which are associated with InfoPyramids, Ex. 1007 (Li), 4:10-13, 4:58-67 ("multiple representations of a multimedia item . . . organized into a pyramid-like data structure, as illustrated in FIG. 2" which "correspond to different representations of objects using different modalities . . . and fidelities"), FIGs. 1 & 3; associating an item of content, which in the context of Senoh may be a preview with an InfoPyramid including ***each implementation of content*** would have been an obvious way of associating the item of content with all of its implementations to ensure that the implementation was correctly associated with the document/catalog, Ex. 1002 (Reddy Decl), ¶¶199-202, 217).

Claim 2: ***[2P] A method of providing access to digital content for use on wireless communication devices, the method comprising:*** (Senoh describes ***a method of providing access to content*** by describing a "catalog" including "catalog data" which includes "previews of content highlights" accessible via a "common bulletin board," Ex. 1004 (Senoh), ¶¶[0043]-[0045], and which can be accessed via a "cellular phone," which is a ***wireless communication device***, *id.*, ¶¶[0060], [0074]; Ex. 1002 (Reddy Decl.), ¶¶73-74, 219); ***[2Ai] receiving and storing in a server system a plurality of items of digital content to be made available for use in wireless communication devices used by a plurality of wireless subscribers,*** (Senoh describes ***receiving and storing a plurality of items of digital content*** by explaining that a content server "generates and sends catalog data for the content to the relay server," and that the relay server—i.e., at least a part of ***a server system***—stores "a compiled catalog of plural catalog data entries," including

"preview[s]" or "a selection of a particular length could be provided as a preview" for music content, Ex. 1004 (Senoh), ¶¶[0044]-[0045]; Ex. 1002 (Reddy Decl.), ¶¶147, 220; these ***items of digital content*** are ***to be made available for use in wireless communication devices***, i.e., Senoh's "cellular phones," Ex. 1004 (Senoh), ¶¶[0060], [0074], which can access Senoh's catalog, *id.*, ¶¶[0044]-[0045], and these devices are, or at least obviously would have been ***used by a plurality of wireless subscribers***, Ex. 1002 (Reddy Decl.), ¶¶78, 220 (citing Ex. 1011, 2:5-7 (describing cellular phone with a "subscriber identity module" (SIM) which identifies a subscriber's device to the network))); ***[2Aii] including receiving and storing a plurality of different implementations of at least one of the items of digital content, where each implementation of any given item of digital content corresponds to a different set of device capabilities;*** (Senoh discloses receiving items of content—"content highlights" and "a selection of a particular length provided as a preview," Ex. 1004 (Senoh), ¶[0044]; Li teaches storing multimedia content that is transcoded "to optimally match the capabilities of the client device requesting it," Ex. 1007 (Li), 2:19-21, that items of content are "transcoded into multiple resolution and modality versions so that they can be rendered on different devices," *id.*, 2:24-26, and that "the transcoded versions of content items to be granted prior to any requests," thus allowing the technique to be used efficiently with "media items such as video and audio," *id.*, 3:4-10; therefore, Senoh in view of Li renders obvious ***receiving and storing a plurality of different implementations of at least one of the items of digital content, where each implementation of any given item of digital content corresponds to a different set of device capabilities***; it would have been obvious to use Li's techniques at content servers such that multiple implementations of items of content corresponding to different sets of device capabilities are received at Senoh's relay server, Ex. 1002 (Reddy Decl.), ¶¶79, 190-191, 204, 210-211, 221234); ***[2B] operating the server system to maintain a product catalog containing a description of the items of digital content wherein the product catalog includes, in association with each item of digital content, a reference to each implementation of said item of digital content;*** (Senoh teaches operating a "relay server"—i.e., at least a part of ***the server system—to maintain a product catalog*** by explaining that the "relay server 2" stores "a compiled catalog of plural catalog data entries," Ex. 1004 (Senoh), ¶[0044], and the ***product catalog*** contains ***a description of the items of content*** such as previews and text as shown in Senoh's Figure 4, *id.*, FIG. 4; Senoh in view of Li renders obvious ***the product catalog includes, in association with each item of digital content, a reference to each implementation of said item of content*** because

Kenner explains that each implementation is referenced by a directory and file name—a "URL might be "http://deliverysite.com/clips/watchme," which is a reference to each implementation of "watchme" such as watchme.mpg and watchme.avi, Ex. 1006 (Kenner), 18:48-56, and including such references to Senoh's previews in Senoh's catalog stored at the relay server would have been obvious, Ex. 1002 (Reddy Decl.), ¶200-202, 222); ***[2C] receiving a request from a wireless device used by one of the subscribers;*** (Senoh in view of Li renders obvious ***receiving a request from a wireless device used by one of the subscribers*** because Senoh's catalog is something that Senoh's cellular phones would request, Ex. 1002 (Reddy Decl.), ¶¶224-226, and Li explains that "[a]s is well known, a Web user (client) makes a request from his client device for some particular Web document(s) or other multimedia content which may contain video, images, graphics, text, audio. The request is sent to a Web server which satisfies the request by returning the requested document to the client," Ex. 1007 (Li), 4:5-10, and the POSITA would have understood that this is how Senoh's clients can request catalog data from the relay server, Ex. 1002 (Reddy Decl.), ¶226); ***[2D] in response to the request, selecting a portion of the product catalog to be presented to the subscriber, based on device capabilities of the wireless device used by the subscriber;*** (Senoh and Li renders obvious that ***in response to the request***—i.e., a request sent to the relay server to access catalog content, "client device profile" data "obtained by," for example, "User-Agent fields in the HTTP . . . request header" is used to "filter[] out" "the versions from the InfoPyramids that do not meet client capabilities 320," and then selects "the appropriate version 374" of the content "which has not been previously filtered out in step 420, to render the customized multimedia document 370," Ex. 1007 (Li), 6:49-56, 10:62-65, and this process of filtering out incompatible content and selecting a part of the InfoPyramid constitutes ***selecting a portion of the product catalog to be presented to the subscriber, based on the device capabilities of the wireless device used by the subscriber*** when applied to Senoh's product catalog, Ex. 1002 (Reddy Decl.), ¶¶228-230); ***[2E] presenting the selected portion of the product catalog to the subscriber via a wireless network, such that the selection portion, as presented to the subscriber, provides only a single description of each item of digital content in said portion, regardless of the number of implementations of each said item.*** (Senoh in view of Li renders obvious ***presenting the selected portion of the product catalog to the subscriber*** because in the selected version of the transcoded content that is not already filtered out—***i.e., the selected portion of the product catalog*** would be presented ***to the subscriber via a wireless network***—i.e., the cellular network in the case of Senoh's cellular

phones, Ex. 1004 (Senoh), ¶¶[0060], [0074], such that ***the selected portion, as presented to the subscriber, provides only a single description of each item of digital content in said portion, regardless of the number of implementations of each said item*** because while there may be various implementations incompatible content is filtered out and only a single one is provided along with accompanying text to describe the content even though more than one version is available, Ex. 1007 (Li), 6:49-67, Ex. 1002 (Reddy), ¶¶232-233).

Claim 4: ***[4P] A method as recited in claim 2, further comprising:*** (Senoh in view of Li renders claim 2 obvious as discussed above); ***[4A] receiving from the subscriber a request for one of the items of digital content in said portion of the product catalog;*** (Senoh discloses ***receiving from the subscriber a request*** because it explains that a user can "send[] a purchase request to the content provider . . . ," Ex. 1004, ¶[0057], and the request can be for ***one of the items of digital content in said portion of the product catalog*** because the user can make the selection by viewing "the bulletin board 25 containing catalog data, views previews of content from the catalog data on the bulletin board 25," and may elect to purchase the item of digital content from the catalog by contacting the content provider, Ex. 1004 (Senoh), ¶[0057]); ***[4B] selecting an implementation of the requested item of digital content, based on device capabilities of the wireless device used by the subscriber; and*** (Senoh discloses and renders obvious ***selecting an implementation of the requested item of digital content, based on device capabilities of the wireless device used by the subscriber*** because "[i]f the format of the content sent to the relay server 2 differs from the format required by the user terminal 1, the relay server 2 converts the received format to the format viewable by the user terminal 1, and then transmits the content to the user terminal 1," where "viewable" refers to whether the terminal "supports the format in which the content will be reproduced . . . ." Ex. 1004 (Senoh), ¶[0059]; *see also id.*, ¶¶[0060]-[0061], [0064]); ***[4C] downloading the selected implementation of the item of digital content to the wireless device used by the subscriber.*** (Senoh discloses and renders obvious a step of ***downloading the selected implementation of the item of digital content to the wireless device used by the subscriber*** by explaining that when the content is in the correct format "the relay server 2 simply sends the content directly to the user terminal 1" and when the content is not in the required format "the relay server 2 converts the received format to the format viewable by the user terminal 1, and then transmits the content to the user terminal 1," Ex. 1004 (Senoh), ¶[0059]-[0060]).

Claim 8: ***[8P] A system comprising*** (Senoh discloses ***a system*** because it describes "an electronic distribution system," Ex. 1004 (Senoh), Abstract, FIG. 2); ***[8A] a network interface through which to communicate over a communication network; and*** (Senoh discloses or renders obvious a ***network interface through which to communicate over a communication network*** because it discloses a "relay server" and "content server" which are "connected to a communication network 4, such as the Internet, through which they can communicate with each other," Ex. 1004 (Senoh), ¶[0029], and an POSITA would have known that ***a network interface*** allowed servers to interface with the physical communication medium over which data is transmitted, Ex. 1002 (Reddy Decl.), ¶¶108, 245); ***[8B] a download manager to*** (Senoh's relay server constitutes a ***download manager*** that performs the claimed functions, Ex. 1004 (Senoh), ¶[0029]; Ex. 1001, 3:66-4:1 (defining download manger); Ex. 1002 (Reddy Decl.), ¶¶109, 246); ***[8Bi] receive and store a plurality of items of content to be made available for use in wireless communication devices used by a plurality of wireless telecommunications subscribers,*** (Senoh describes a download manager that can ***receive and store a plurality of items of content*** by explaining that a content server "generates and sends catalog data for the content to the relay server," and that the relay server stores "a compiled catalog of plural catalog data entries," including "preview[s]" or "a selection of a particular length could be provided as a preview" for music content, Ex. 1004 (Senoh), ¶¶[0044]-[0045]; Ex. 1002 (Reddy Decl.), ¶¶76-77, 189, 247; these ***items of content*** are ***to be made available for use in wireless communication devices***, i.e., Senoh's "cellular phones," Ex. 1004 (Senoh), ¶¶[0060], [0074], which can access Senoh's catalog, *id.*, ¶¶[0044]-[0045], and these devices are, or at least obviously would have been ***used by a plurality of wireless subscribers***, Ex. 1002 (Reddy Decl.), ¶¶78, 189, 247 (citing Ex. 1011, 2:5-7 (describing cellular phone with a "subscriber identity module" (SIM) which identifies a subscriber's device to the network))); ***[8Bii] including receiving a plurality of different implementations of at least one of the items of content, where each implementation of any given item of content corresponds to a different set of device capabilities;*** (Senoh discloses receiving items of content—"content highlights" and "a selection of a particular length provided as a preview," Ex. 1004 (Senoh), ¶[0044]; Li teaches storing multimedia content that is transcoded "to optimally match the capabilities of the client device requesting it," Ex. 1007 (Li), 2:19-21, that items of content are "transcoded into multiple resolution and modality versions so that they can be rendered on different devices," *id.*, 2:24-26, and that "the transcoded versions of content items to

be granted prior to any requests," thus allowing the technique to be used efficiently with "media items such as video and audio," *id.*, 3:4-10; therefore, Senoh in view of Li renders obvious ***receiving a plurality of different implementations of at least one of the items of content, where each implementation of any given item of content corresponds to a different set of device capabilities***; it would have been obvious to use Li's techniques at content servers such that multiple implementations of items of content corresponding to different sets of device capabilities are received at Senoh's relay server, Ex. 1002 (Reddy Decl.), ¶¶190-191, 204, 207, 248) ***and [8Biii] maintain a product catalog containing a description of the items of content, the product catalog including, in association with each item of content, a reference to each implementation of said item of content.*** (Senoh teaches a download manager configured to ***maintain a product catalog*** by explaining that the "relay server 2" stores "a compiled catalog of plural catalog data entries," Ex. 1004 (Senoh), ¶[0044], and the ***product catalog*** contains ***a description of the items of content*** such as previews and text as shown in Senoh's Figure 4, *id.*, FIG. 4; Senoh in view of Li renders obvious ***including, in association with each item of content, a reference to each implementation of said item of content*** because Li teaches a "multimedia document" with "a number of content items Ai," which are associated with InfoPyramids, Ex. 1007 (Li), 4:10-13, 4:58-67 ("multiple representations of a multimedia item . . . organized into a pyramid-like data structure, as illustrated in FIG. 2" which "correspond to different representations of objects using different modalities . . . and fidelities"), FIGs. 1 & 3; associating an item of content, which in the context of Senoh may be a preview with an InfoPyramid including ***each implementation of content*** would have been an obvious way of associating the item of content with all of its implementations to ensure that the implementation was correctly associated with the document/catalog, Ex. 1002 (Reddy Decl), ¶¶200-202, 249).

Claim 9: ***[9P] A system comprising:*** (Senoh discloses ***a system*** because it describes "an electronic distribution system," Ex. 1004 (Senoh), Abstract, FIG. 2); ***[9A] a processor; and*** (A POSITA would have understood that Senoh discloses a processor because Senoh teaches a "content distribution system 10," including "'relay server 2," and "content server 3," which communicate over a "communication network 4, such as the Internet," Ex. 1004 (Senoh), ¶[0029], data can be converted into formats such as MPEG-2 and MPEG-4, which requires a processor, Ex. 1002 (Reddy Decl.), ¶253, and Senoh explains that the operations can "be written as a computer program causing a computer to execute the various processes," Ex. 1004 (Senoh), ¶[0081]); ***[9B]***

a storage facility accessible to the processor and containing code which, when executed by the processor, causes the processing system to (Senoh discloses or at least renders obvious a ***storage facility accessible to the processor and containing code*** by explaining that "processing operations of the various components . . . can also be written as a computer program" and "recorded to . . flash memory or other semiconductor storage medium," for example, Ex. 1004 (Senoh), ¶[0081], and ***when executed by the processor***, the code ***causes the processing system*** to perform the functions described in the following limitations); ***[9Bi] receive and store a plurality of items of digital content to be made available for use in wireless communication devices used by a plurality of wireless communication subscribers*** (Senoh describes ***receiving and storing a plurality of items of digital content*** by explaining that a content server "generates and sends catalog data for the content to the relay server," and that the relay server—i.e., at least a part of ***a server system***—stores "a compiled catalog of plural catalog data entries," including "preview[s]" or "a selection of a particular length could be provided as a preview" for music content, Ex. 1004 (Senoh), ¶¶[0044]-[0045]; Ex. 1002 (Reddy Decl.), ¶¶76-77, 147, 257; these ***items of digital content*** are ***to be made available for use in wireless communication devices***, i.e., Senoh's "cellular phones," Ex. 1004 (Senoh), ¶¶[0060], [0074], which can access Senoh's catalog, *id.*, ¶¶[0044]-[0045], and these devices are, or at least obviously would have been ***used by a plurality of wireless subscribers***, Ex. 1002 (Reddy Decl.), ¶¶78, 147, 257 (citing Ex. 1011, 2:5-7 (describing cellular phone with a "subscriber identity module" (SIM) which identifies a subscriber's device to the network))); ***[9Bii] including receiving and storing a plurality of different implementations of at least one of the items of digital content, where each implementation of any given item of digital content corresponds to a different set of device capabilities;*** (Senoh discloses receiving items of content—"content highlights" and "a selection of a particular length provided as a preview," Ex. 1004 (Senoh), ¶[0044]; Li teaches storing multimedia content that is transcoded "to optimally match the capabilities of the client device requesting it," Ex. 1007 (Li), 2:19-21, that items of content are "transcoded into multiple resolution and modality versions so that they can be rendered on different devices," *id.*, 2:24-26, and that "the transcoded versions of content items to be granted prior to any requests," thus allowing the technique to be used efficiently with "media items such as video and audio," *id.*, 3:4-10; therefore, Senoh in view of Li renders obvious ***receiving a plurality of different implementations of at least one of the items of content, where each implementation of any given item of content corresponds to a different set of device***

capabilities; it would have been obvious to use Li's techniques at content servers such that multiple implementations of items of content corresponding to different sets of device capabilities are received at Senoh's relay server, Ex. 1002 (Reddy Decl.), ¶¶191, 258); ***[9Biii] maintain a product catalog containing a description of the items of digital content, wherein the product catalog includes, in association with each item of digital content, a reference to each implementation of said item of digital content;*** (Senoh teaches a download manager configured to ***maintain a product catalog*** by explaining that the "relay server 2" stores "a compiled catalog of plural catalog data entries," Ex. 1004 (Senoh), ¶[0044], and the ***product catalog*** contains ***a description of the items of content*** such as previews and text as shown in Senoh's Figure 4, *id.*, FIG. 4; Senoh in view of Li renders obvious ***including, in association with each item of content, a reference to each implementation of said item of content*** because Li teaches a "multimedia document" with "a number of content items Ai," which are associated with InfoPyramids, Ex. 1007 (Li), 4:10-13, 4:58-67 ("multiple representations of a multimedia item . . . organized into a pyramid-like data structure, as illustrated in FIG. 2" which "correspond to different representations of objects using different modalities . . . and fidelities"), FIGs. 1 & 3; associating an item of content, which in the context of Senoh may be a preview with an InfoPyramid including ***each implementation of content*** would have been an obvious way of associating the item of content with all of its implementations to ensure that the implementation was correctly associated with the document/catalog, Ex. 1002 (Reddy Decl), ¶¶200-202, 259); ***[9Biv] receive a request from a wireless device used by one of the subscribers;*** (Senoh in view of Li renders obvious ***receiving a request from a wireless device used by one of the subscribers*** because Senoh's catalog is something that Senoh's cellular phones would request, Ex. 1002 (Reddy Decl.), ¶¶224-226, 260, and Li explains that "[a]s is well known, a Web user (client) makes a request from his client device for some particular Web document(s) or other multimedia content which may contain video, images, graphics, text, audio. The request is sent to a Web server which satisfies the request by returning the requested document to the client," Ex. 1007 (Li), 4:5-10, and the POSITA would have understood that this is how Senoh's clients can request catalog data from the relay server, Ex. 1002 (Reddy Decl.), ¶¶224-226, 260); ***[9Bv] in response to the request, select a portion of the product catalog to be presented to the subscriber, based on device capabilities of the wireless device used by the subscriber; and*** (Senoh and Li renders obvious that ***in response to the request***—i.e., a request sent to the relay server to access catalog content, "client device profile"

data "obtained by," for example, "User-Agent fields in the HTTP . . . request header" is used to "filter[] out" "the versions from the InfoPyramids that do not meet client capabilities 320," and then selects "the appropriate version 374" of the content "which has not been previously filtered out in step 420, to render the customized multimedia document 370," Ex. 1007 (Li), 6:49-56, 10:62-65, and this process of filtering out incompatible content and selecting a part of the InfoPyramid constitutes ***selecting a portion of the product catalog to be presented to the subscriber, based on the device capabilities of the wireless device used by the subscriber*** when applied to Senoh's product catalog, Ex. 1002 (Reddy Decl.), ¶¶229-230, 261); ***[9Bvi] cause the selected portion of the product catalog to be presented to the subscriber via a wireless telecommunications network, such that the selected portion, as presented to the subscriber, provides only a single description of each item of digital content in said portion, regardless of the number of implementations of each said item.*** (Senoh in view of Li renders obvious a download manager configured to ***cause the selected portion of the product catalog to be presented to the subscriber via a wireless telecommunications network*** because in the selected version of the transcoded content that is not already filtered out—***i.e., the selected portion of the product catalog*** would be presented ***to the subscriber via a wireless network***—i.e., the cellular network in the case of Senoh's cellular phones, Ex. 1004 (Senoh), ¶¶[0060], [0074], such that ***the selected portion, as presented to the subscriber, provides only a single description of each item of digital content in said portion, regardless of the number of implementations of each said item*** because while there may be various implementations incompatible content is filtered out and only a single one is provided along with accompanying text to describe the content even though more than one version is available, Ex. 1007 (Li), 6:49-67, Ex. 1002 (Reddy), ¶¶232-233, 262).

D. Secondary Considerations

This Request demonstrates that the Challenged Claims of the '790 Patent are unpatentable as obvious in view of the prior art references. Applicants did not identify any evidence of secondary considerations during prosecution. Further, the clear teachings in the prior art cannot be overcome by any supposed "secondary considerations." *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 36 (1966).

V. DISCLOSURE OF CONCURRENT LITIGATION, REEXAMINATION, AND RELATED PROCEEDINGS

Based on information available to Requester, the '790 Patent is not the subject of any other proceedings before the USPTO, but it is the subject of the following pending civil actions:

- *Starz Entertainment, LLC v. VL Collective, IP, LLC*, No. 1:21-cv-01448 (D. Del.); and
- *VideoLabs, Inc. v. Netflix Inc.*, No. 22-cv-00229 (D. Del.).

VI. CONCLUSION

Reexamination and cancellation of claims 1-2, 4, and 8-9 of the '790 patent is respectfully requested. The Commissioner is hereby authorized to charge Deposit Account 50-6990 under Docket No. 185945.011600 the *Ex Parte* Reexamination fee of $12,600 under 37 C.F.R. § 1.20(c)(1). Requester believes no other fee is due with this submission, however, the Commissioner is hereby authorized to charge any fee deficiency or credit any over-payment to Deposit Account 50-6990.

Please direct all correspondence in this matter to the undersigned.

Dated: 6/23/2022

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APPENDIX A

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SNQ1: U.S. Patent Application Publication No. 2002/0078178 A1 to Senoh ("Senoh," Ex. 1004) in view of U.S. Patent No. 6,035,339 to Agraharam et al. ("Agraharam," Ex. 1005) renders claims 1 and 8 obvious.

Senoh is prior art under pre-AIA 35 U.S.C. § 102(e) because it was filed in the United States on August 27, 2001 and published on June 20, 2002. Agraharam is prior art under pre-AIA 35 U.S.C. § 102(b) because it issued on March 7, 2000.

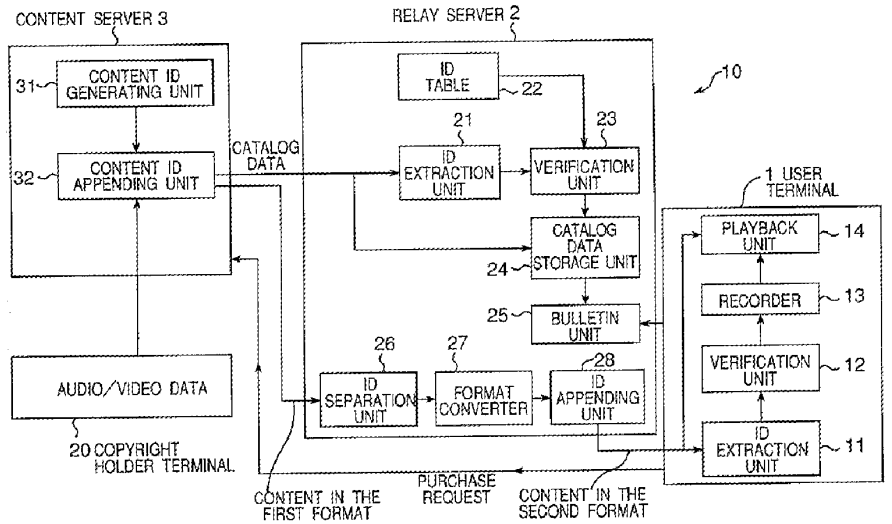
	Claim	Prior Art Disclosures
[1P]	A method of providing access to content for use on wireless communication devices, the method comprising:	The preamble is not a limitation of the claim. However, even if the preamble is interpreted as being a limitation of the claim, Senoh discloses a method of providing access to content for use on wireless communication devices. Senoh discloses ***wireless communication devices*** because it discloses cellular user terminals that include cellular phones.[1] Ex. 1002 (Reddy Decl.), ¶73. Specifically, Senoh teaches a "user terminal 1" that accesses a relay server 2 which receives and stores catalog data related to various items of multimedia content. This is illustrated in Senoh Figure 2 (below).

[1] In this chart emphasis is indicated in underline while references to the claim language is shown in ***bold italics***. All emphasis is added unless otherwise indicated.

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	Claim	Prior Art Disclosures

Fig.2



Ex. 1004 (Senoh), Fig. 2.

The "user terminal" can be a "cellular phone." Ex. 1004 (Senoh), ¶¶[0060], [0074] ("The user terminal 1 could be a personal computer, cellular phone, or television or video deck having a communication function."). While only one terminal is shown, the POSITA would have understood that cellular networks have many subscribers, and thus multiple cellular phones are contemplated. Ex. 1002 (Reddy Decl.), ¶74; Ex. 1004 (Senoh), ¶[0029] ("It will be obvious to one with ordinary skill in the related art that while only one user terminal 1 is shown in the figure, plural user terminals can be connected.").

Senoh further describes a ***method of providing access to content for use on the wireless communication devices.*** Ex. 1002 (Reddy Decl.), ¶75. One example of content that Senoh allows terminals to access is "catalog data," which may "contain previews of content highlights" such as a sample of a song or a video clip of a full-length video. Ex. 1004 (Senoh), ¶¶[0043]-[0044]. This content is accessible to the user for use on the wireless

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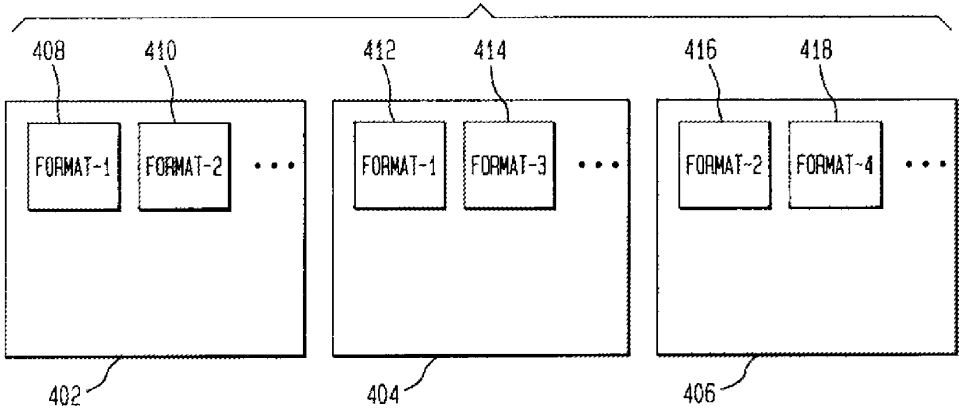
	Claim	Prior Art Disclosures
		communications devices through a "common bulletin board" which includes a product catalog. *Id.*, ¶[0045].
[1Ai]	receiving and storing a plurality of items of content to be made available for use in wireless communication devices used by a plurality of wireless services subscribers,	This limitation is disclosed by and would have been obvious over Senoh. Senoh discloses and renders obvious ***receiving and storing a plurality of items of content to be made available for use in wireless communication devices used by a plurality of wireless services subscribers***. Senoh teaches ***receiving and storing a plurality of items of content*** in the relay server in because Senoh's relay server receives previews of the content made available from copyright holders using Senoh's system. An example of content stored in the relay server (2) disclosed in Senoh is provided in Figure 4 (below). *Fig.4* CONTENT NAME | CONTENT 1 | CONTENT 2 | ... PREVIEW | PREVIEW OF CONTENT 1 (WITH DIGITAL WATERMARK) | PREVIEW OF CONTENT 2 (WITH DIGITAL WATERMARK) | ... CONTENT RECORDING DATE | 2000.6.17 | 1999.12.31 | ... WHO RECORDED THE CONTENT | TARO YAMASHITA | HANAKO UENO | ... TITLE | BATTLE IN PEBBLE BEACH | COUNTDOWN 2000 | ... GENRE | SPORTS | EVENT | ... CONTENT TYPE | FINAL (GOLF TOURNAMENT) | NEW YEAR'S EVE | ... DUPLICATION FEE | $10 | $5 | ... ... | ... | ... | ... CONTACT ADDRESS FOR THE BUYER | abc@def | ghi@jkl | ... | | | ... WARNING | UNAUTHORIZED ACT OF COPYING IS SUBJECT TO PENALTY CATALOG

	Claim	Prior Art Disclosures
		Ex. 1004 (Senoh), FIG. 4 (showing previews displayed in product catalog). This figure shows "[a] sample catalog compiling plural catalog entries," from which users can "select desired content by accessing [a] bulletin board on the relay server 2 and viewing the catalog." *Id.*, ¶[0045]. Thus, the relay server ***receives and stores*** "a compiled catalog of plural catalog data entries." *Id.*, ¶[0044]. These catalog entries include audio and video previews for videos and music content. *Id.*, ¶[0044] ("If the content contains video, the relay server 2 preferably enables the content highlights to be previewed. If the content is audio (music), a selection of a particular length could be provided as a preview."). These previews, whether they be audio or video, are ***a plurality of items of content***. These ***plurality of items of content*** are received and stored at Senoh's relay server. For example, Senoh explains that the content server "generates and sends catalog data for the content to the relay server 2 in order to market the content to a wider audience." Ex. 1004 (Senoh), ¶[0043]. "[T]he relay server is a server computer accessible from the network and storing a compiled catalog of plural catalog data entries." *Id.*, ¶[0044]; *see also id.*, ¶[0055] ("[T]he verification unit 23 allows the catalog data storage unit to store the catalog data."). Thus, the items of content (content previews) are received by the relay server from the content server and stored so that they can be made available to users of user terminals such as Senoh's ***wireless communication devices*** (Senoh's "cellular phone[s]," Ex. 1004 (Senoh), ¶¶[0060], [0074]) operated by ***wireless service subscribers,*** Ex. 1002 (Reddy Decl.), ¶78 (citing Ex. 1011, 2:5-7 and explaining that wireless services for cellular phones provided as a subscription service using, for example, Subscriber Identity Modules in cellular phones).
[1Aii]	including receiving a plurality of different implementations of at least one of the items of content, where each implementation of any given item of content correspondents to a different set of device capabilities; and	While Senoh teaches receiving a plurality of items of content as discussed with respect to Limitation [1Aii], Senoh does not describe ***receiving a plurality of different implementations of at least one of the items of content, where each implementation of any given item of content corresponds to a different set of device capabilities***. Senoh is silent about how to ensure that a variety of different user terminals having different viewing requirements can view the various previews in the catalog. Ex. 1002 (Reddy Decl.), ¶93.

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	Claim	Prior Art Disclosures
		A solution for this is found in Agraharam. Agraharam teaches ***receiving a plurality of different implementations of at least one of the items of content, where each implementation of any given item of content corresponds to a different set of device capabilities.*** Agraharam teaches that "information source 108" (also called a "multimedia information source 108") is the source of information in the system. *See* Ex. 1005 (Agraharam), 2:39, 2:53-55 ("[T]he network information delivery device 110 retrieves the multimedia information, for example, from the information source 108 . . ."), 4:31-33 ("The network information delivery device 110 may retrieve the requested information from information sources such as information source 108 . . . ."). The multimedia information stored in the multimedia information source 108 "maybe formatted into predetermined formats for efficient delivery to the end-user." Ex. 1005 (Agraharam), 4:39-43. > For example, FIG. 4 shows multimedia information 402, 404 and 406 being formatted in a plurality of formats such as format-1 to format-4. Format-1 to format-4 may be formats such as "Audio Video Interleave" (AVI) (Microsoft's 'Video for Windows' standard) or "QuickTime." Thus, as shown in FIG. 4, multimedia information 402 is formatted in at least format-1 408 and format-2 410; multimedia information 404 is formatted in at least format-1 412 and format-3 414 and multimedia information 406 is formatted in at least format-2 416 and format-4 418. Cases that require formats other than the predetermined formats may be handled by formatting the information "on-the-fly" to ensure optimal information delivery to, and reproduction by the end-user terminal 114. Ex. 1005 (Agraharam), 4:44-57. The different items of content disclosed by Agraharam are shown as 402, 404, and 406, and the different implementations are shown as "Format-1" through "Format-4" (408, 410, 412, 414, 416, and 418), as illustrated below:

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	Claim	Prior Art Disclosures
		FIG. 4  *Id.*, FIG. 4. Agraharam teaches that these different items of information and their respective implementations "from information sources such as information source 108 may be deposited in the information delivery database" maintained by the information delivery device 110, thereby reducing network traffic. Ex. 1005 (Agraharam), 4:60-67. These different implementations represent "predetermined formats" and are provided to the user terminals based on the capabilities of the end-user terminals. *Id.*, 4:35-39 ("Because end-users obtain end-user terminal capabilities by purchasing equipment that is available on the market, end-user terminal requirements can be grouped which allows information such as multimedia information to be preformatted into predetermined formats."). Thus, the different implementations of the items of content described by Agraharam correspond to different sets of device capabilities associated with different user terminals. Ex. 1002 (Reddy Decl.), ¶83. Based on Agraharam, it would have been obvious to modify Senoh's catalog such that it received ***a plurality of different implementations of at least one of the items of content,***

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	Claim	Prior Art Disclosures
		where each implementation of any given item of content corresponds to a different set of device capabilities. A POSITA would have looked to Agraharam for several reasons. First, the POSITA would have understood that different devices having different capabilities for viewing multimedia content like Senoh's previews needed to have the data delivered in certain formats to display well on the devices. Ex. 1002 (Reddy Decl.), ¶¶39-44, 92; Ex. 1004 (Senoh), ¶[0008] ("A problem arises . . . when the specifications of the distributed content differ from the specifications of content that is viewable on the user's terminal or monitor, resulting in the user being unable to enjoy the content."); Ex. 1005 (Agraharam), ("[I]f none of the predetermined formats are suitable for information reproduction by the user terminal, the user terminal reproduces the information in an undesirable manner."). A POSITA would have been motivated to perform a step of receiving preview data in different implementations corresponding to different devices that access Senoh's catalog, and storing that data with other catalog data at the relay server, so that a wide variety of devices can preview the content from the catalog, thus further disseminating the content to a variety of users, as desired by Senoh. Ex. 1004 (Senoh), ¶[0043]. Second, a POSITA knew that content creators wanted to have control over how the different versions of their content displayed on devices. Ex. 1002 (Reddy Decl.), ¶96; Ex. 1008 (Britton), p.156 ("The primary advantages of static transcoding are quality of presentation and performance.[] Each page is constructed by a human designer, generally working with tools that show how the application will look or sound and thus allowing the presentation to be hand-tailored for each environment."). To provide content creators the ability to control the appearance of different implementations of their content, the POSITA would have seen a benefit to having the content server maintain different, preformatted implementations of the previews, and provide those to Senoh's relay server to market the content to a wider audience. Ex. 1002 (Reddy Decl.), ¶96; Ex. 1004 (Senoh), ¶[0044] (catalog for marketing to wider audience). Third, a POSITA knew that latency in viewing content on the Web affected the user experience. Ex. 1002 (Reddy Decl.), ¶97. Thus, using the same transcoding processes that

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	Claim	Prior Art Disclosures
		Senoh uses for purchased full-length content would have been unattractive for Senoh's previews. Ex. 1002 (Reddy Decl.), ¶95. A POSITA would have understood from Senoh that content in the catalog originated from different content creators/copyright holders. Ex. 1002 (Reddy Decl.), ¶97. Specifically, Senoh explains that the copyright holder and content server computers could be the same machines, Ex. 1004 (Senoh), ¶[0032], that each copyright holder receives a unique ID, *id.*, ¶[0034], and that the relay server stores a catalog with content from multiple copyright holders, *id.*, ¶[0054], FIG. 5; Ex. 1002 (Reddy Decl.), ¶97. Therefore, to implement a system where the content server maintains the previews until requested would have caused the content to be fetched when the catalog data was requested, sent to the relay server, transcoded at the relay server, and sent to the user terminal, from each of the content servers that provided catalog content. This would have added latency to the system, resulting in a potentially frustrating user experience that could lead to the perception that the service was poor quality. Ex. 1002 (Reddy Decl.), ¶97. Therefore, transcoding the preview content in advance like Agraharam does would have been seen as a way to reduce latency for resource intensive audio and video content like Senoh's previews. *Id.* And, while users might be willing to wait for content to be transcoded after they pay for it and await its delivery, users may be less tolerant of delays while viewing a number of different previews in the catalog while browsing for something they may want to buy. *Id.* Thus, the POSITA would have been led to look to Agraharam for a solution to the problem of ensuring content was delivered to devices in a format they could properly view. Fourth, storing multiple implementations of an item of content (previews) is one of a finite number of predictable solutions available to the POSITA for enabling content to be tailored to the user terminals requesting Senoh's previews. Ex. 1002 (Reddy Decl.), ¶98. Indeed, besides receiving and storing different implementations of items of content, one implementation could be received and transcoded at the relay server; implementations may be transcoded on the fly from a single implementation, or, contrary to Senoh's teachings, the catalog content could be kept at content servers and either transcoded there statically or dynamically. *Id.*. These solutions all had predictable results as the concepts of "static" transcoding and "dynamic" transcoding were discussed in the literature and had known implications. *See, e.g.*, Ex. 1008, pp.154-157.

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	Claim	Prior Art Disclosures
		A POSITA would have been motivated to perform a step of receiving preview data in different implementations corresponding to different devices that access Senoh's catalog so that a wide variety of devices can preview the content from the catalog, thus further disseminating the content to a variety of users, as desired by Senoh. Ex. 1004 (Senoh), ¶[0043] (explaining that the catalog is for marketing "content to a wider audience"); Ex. 1002 (Reddy Decl.), ¶94. Applying Agraharam's technique of encoding different implementations of items of content and storing them in a database/repository at an information delivery device 110 to the storage of previews in Senoh's relay server would have merely applied a known technique to Senoh's known system, which was ready for improvement. Ex. 1002 (Reddy Decl.), ¶100. Furthermore, Agraharam provides a known solution to a problem apparent in Senoh's catalog system—namely that the catalog previews would be viewable on only certain terminals because they were not transcoded into different formats for a variety of user terminals. *Id.*. Applying Agraharam's technique to Senohs' previews thus transcoding the data into different formats for different terminal capabilities would have merely yielded the predictable results of better ensuring that user terminals could view the preview content on their terminals and support a broad range of terminal types and capabilities. *Id.*, ¶100. The POSITA would have had a reasonable expectation of succeeding in combining the teachings of Agraharam and Senoh to provide for receipt and storage of multiple implementations of the previews because it provides a known simple technique to provide multimedia content to diverse device types in an efficient manner. Ex. 1002 (Reddy Decl.), ¶101.
[1B]	maintaining a product catalog containing a description of the items of content, the product catalog including, in association with each item of content, a reference to each implementation of said item of content.	Senoh teaches ***maintaining a product catalog containing a description of items of content***. Specifically, Senoh explains that "content server 3 . . generates and sends catalog data for content to the relay server 2 in order to market the content to a wider audience." Ex. 1004 (Senoh), ¶[0043]. "[T]he relay server 2 is a server computer accessible from the network and storing a compiled catalog of plural catalog data entries." *Id.*, ¶[0044]. "A sample catalog compiling plural catalog data entries is shown in FIG. 4." *Id.*, ¶[0045].

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	Claim	Prior Art Disclosures

Fig.4

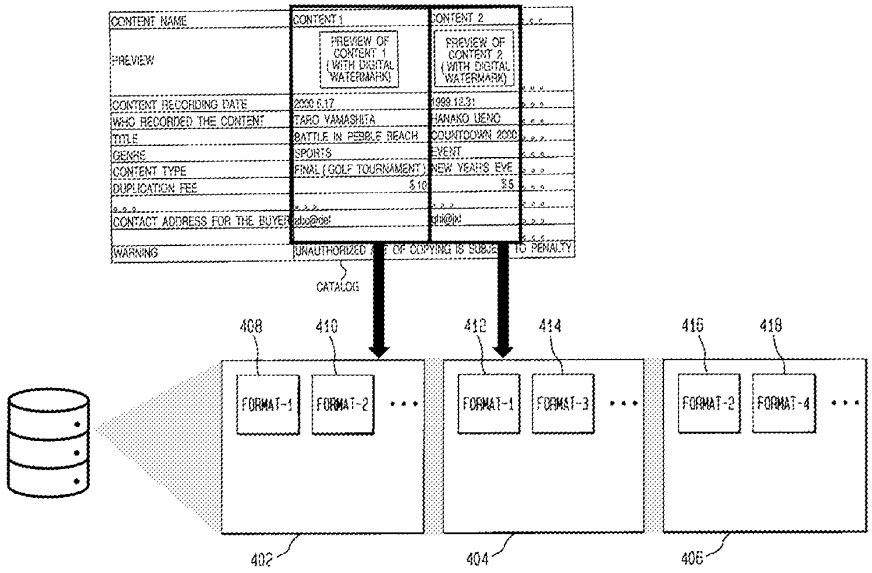
CONTENT NAME	CONTENT 1	CONTENT 2	∘ ∘ ∘
PREVIEW	PREVIEW OF CONTENT 1 (WITH DIGITAL WATERMARK)	PREVIEW OF CONTENT 2 (WITH DIGITAL WATERMARK)	∘ ∘ ∘
CONTENT RECORDING DATE	2000.6.17	1999.12.31	∘ ∘ ∘
WHO RECORDED THE CONTENT	TARO YAMASHITA	HANAKO UENO	∘ ∘ ∘
TITLE	BATTLE IN PEBBLE BEACH	COUNTDOWN 2000	∘ ∘ ∘
GENRE	SPORTS	EVENT	∘ ∘ ∘
CONTENT TYPE	FINAL (GOLF TOURNAMENT)	NEW YEAR'S EVE	∘ ∘ ∘
DUPLICATION FEE	$10	$5	∘ ∘ ∘
∘ ∘ ∘	∘ ∘ ∘	∘ ∘ ∘	∘ ∘ ∘
CONTACT ADDRESS FOR THE BUYER	abc@def	ghi@jkl	∘ ∘ ∘
			∘ ∘ ∘
WARNING	UNAUTHORIZED ACT OF COPYING IS SUBJECT TO PENALTY		

CATALOG

Ex. 1004 (Senoh), FIG. 4. Senoh's ***product catalog*** includes ***descriptions of items of content*** because provides for information such as title, a preview, genre, etc., *See* Ex. 1004 (Senoh), ¶[0044]; FIG. 4.

Based on the combined teachings of Senoh and Agraharam, it would have been obvious to have ***a reference to each implementation of each item of content as recited in this claim***. Specifically, as explained above, it would have been obvious to receive and store various implementations of each item of content at Senoh's relay server so that the previews of the content could be accessed and provided to as many end-users via their terminals as possible. *See above*, *Limitation [1Aii]*. Based on this modification, Senoh's catalog would reference not only each item of content stored in the relay server database, but also each implementation of each item of content, as illustrated below. *See* Ex. 1002 (Reddy Decl.), ¶¶87-89, 102-104.

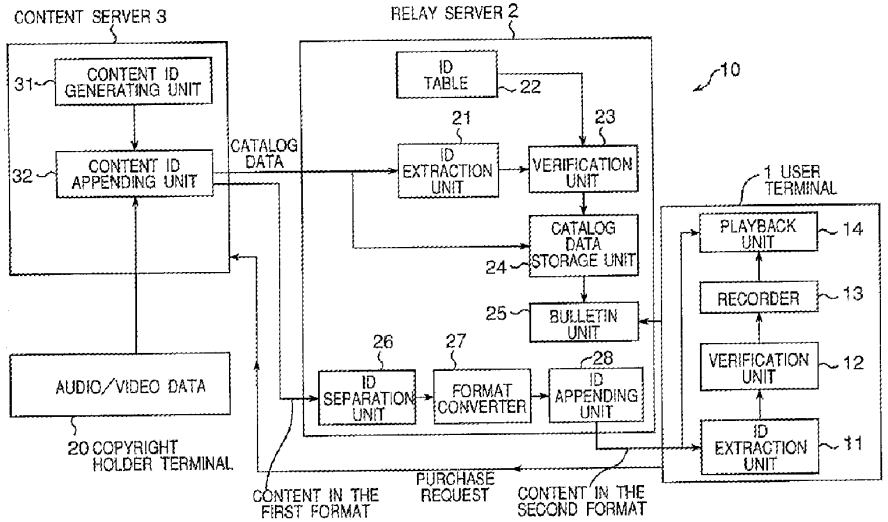
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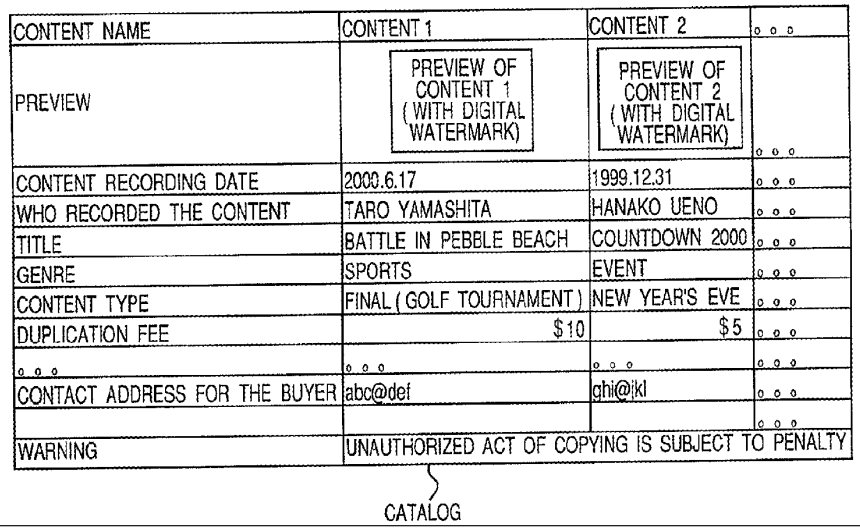
	Claim	Prior Art Disclosures
		 Ex. 1002 (Reddy Decl.), ¶88. Thus, in the combined Senoh-Agraharam system, Senoh's catalog includes a reference to each implementation of said item of content. For instance Senoh's "Content 1" refers to item of content 402, and each implementation of that item of content (i.e., items 408 and 410). Ex. 1002 (Reddy Decl.), ¶88. It would have been obvious to implement Senoh's catalog to refer to each implementation of said item of content because it would permit the selection of specific items of content from the catalog in a manner that allows the system to provide the desired content to the user in a format that was best-suited for the user's terminal by enabling the system to determine which implementation (i.e., which format) is appropriate for the user terminal, as contemplated by both Senoh and Agraharam. Ex. 1004 (Senoh), ¶[0059] ("If the format of the content sent to the relay server 2 differs from the format required by the user terminal 1, the relay server 2 converts the received format to the format viewable by the

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	Claim	Prior Art Disclosures
		user terminal 1, and then transmits the content to the user terminal 1."); Ex. 1005 (Agraharam), 4:27-30 ("[T]he network information delivery device 110 can automatically determine the best information delivery parameters required for effective delivery of the information requested by the end-user."). A POSITA would have thus been motivated to associate references to the stored implementations of the items of the content and thus references to each implementation of the items of content with the listings of those items of content in the catalog because it would have allowed the combined system to provide requested content to the end-user in a format that is viewable by the end-user on their terminal. Ex. 1002 (Reddy Decl.), ¶102-104. And, the POSITA would have reasonably anticipated success in making the combination to include references to each implementation because such references allowed access to stored content and had been routinely used to access databases to retrieve content based on the references well before the '790 patent. *Id.*, ¶102-104.
[8P]	A system comprising:	The preamble is not a limitation of the claim. Even if the preamble is interpreted as being a limitation of the claim, Senoh discloses ***a system***. For instance, Senoh describes and illustrates "an electronic distribution system." Ex. 1004 (Senoh), Abstract. Figure 2 shows "a specific configuration of [the] content distribution system." *Id.*, ¶[0022].

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	Claim	Prior Art Disclosures
		Fig.2  Ex. 1004 (Senoh), FIG. 2.
[8A]	a network interface through which to communicate over a communication network; and	Senoh discloses or renders obvious a ***network interface through which to communicate over a communication network***. Specifically, Senoh teaches that "[c]ontent distribution system 10 has a user terminal 1, relay server 2, and content server 3. The user terminal 1, relay server 2, and content server 3 are each connected to a communication network 4, such as the Internet through which they can communicate with each other." Ex. 1004 (Senoh), ¶[0029]. A POSITA would have understood that the interface between hardware connected to the network and the network itself is a network interface, and therefore would have appreciated at there is a network interface in each of the relay server, content server, and user terminal that allows data to be communicated from these systems over the network such as the Internet. Ex. 1002 (Reddy Decl.), ¶108.
[8B]	a download manager to	Senoh discloses and renders obvious ***a download manager***. As used in the '790 Patent, the term "download manager" refers to an application server in the server system. *See* Ex. 1001, 3:66-4:1 ("The server system includes an application server referred to herein as a 'download manager.'").

	Claim	Prior Art Disclosures
		In Senoh, the claimed "download manager" is the relay server. *See, e.g.*, Ex. 1004 (Senoh), FIGS. 1 & 2; ¶¶[0029] ("The relay server 2 converts the content received form the content server 3 in the first format to a second format specification, and sends the reformatted content to the user terminal 1."), [0043]-[0045] (describing catalog provided by relay server), [0046] (describing relay server). A POSITA would have understood Senoh's relay server functionality constitutes a download manager. Ex. 1002 (Reddy Decl.), ¶109 (citing Ex. 1001 ('790 pat.) 3:66-4:1 ("The server system includes an application referred to herein as the 'download manager.'").
[8Bi]	receive and store a plurality of items of content to be made available for use in wireless communication devices used by a plurality of wireless telecommunications subscribers,	Senoh discloses and renders obvious a download manager to ***receive and store a plurality of items of content to be made available for use in wireless communication devices used by a plurality of wireless telecommunications subscribers.*** Senoh discloses a catalog with multiple items of content as shown in Figure 4 (below). *Fig.4*  CONTENT NAME | CONTENT 1 | CONTENT 2 | ... PREVIEW | PREVIEW OF CONTENT 1 (WITH DIGITAL WATERMARK) | PREVIEW OF CONTENT 2 (WITH DIGITAL WATERMARK) | ... CONTENT RECORDING DATE | 2000.6.17 | 1999.12.31 | ... WHO RECORDED THE CONTENT | TARO YAMASHITA | HANAKO UENO | ... TITLE | BATTLE IN PEBBLE BEACH | COUNTDOWN 2000 | ... GENRE | SPORTS | EVENT | ... CONTENT TYPE | FINAL (GOLF TOURNAMENT) | NEW YEAR'S EVE | ... DUPLICATION FEE | $10 | $5 | ... ... | ... | ... | ... CONTACT ADDRESS FOR THE BUYER | abc@def | ghi@jkl | ... WARNING | UNAUTHORIZED ACT OF COPYING IS SUBJECT TO PENALTY CATALOG

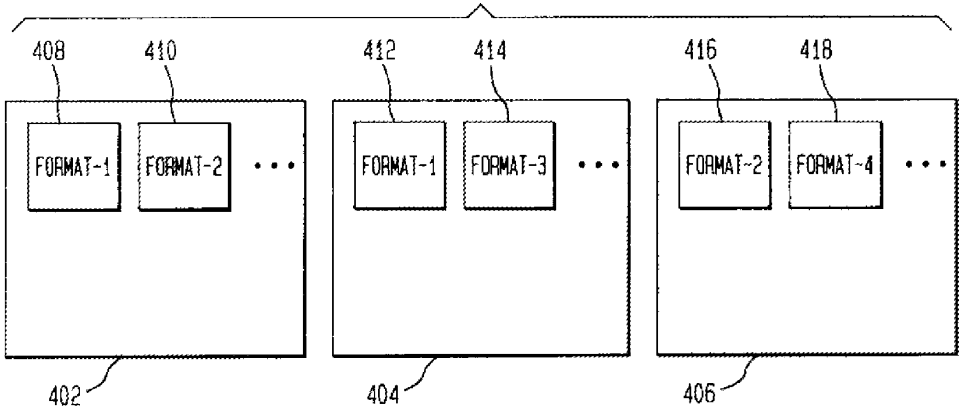
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	Claim	Prior Art Disclosures
		Ex. 1004 (Senoh), FIG. 4. This figure shows "[a] sample catalog compiling plural catalog entries," from which users can "select desired content by accessing [a] bulletin board on the relay server 2 and viewing the catalog." *Id.*, ¶[0045]. Thus, the relay server stores "a compiled catalog of plural catalog data entries." *Id.*, ¶[0044]. Content stored at relay server includes previews of audio or video data: "If the content contains video, the relay server 2 preferably enables the content highlights to be previewed. If the content is audio (music), a selection of a particular length could be provided as a preview." Ex. 1004 (Senoh), ¶[0044]; *see also id.*, FIG. 4. Here, a first item of content is "Preview of Content 1" and a second item of content is "Preview of Content 2," and thus are ***a plurality of items of content*** which are to be made available to user terminals including ***wireless communication devices used by a plurality of wireless services subscribers***. Ex. 1002 (Reddy Decl.), ¶¶76-78, 110; Ex. 1011, 2:5-7 (describing SIM cards to identify cellular phone service subscribers to the network). These items of content are provided from Senoh's content server 3 and are ***received*** by, and ***stored*** in, the relay server. *See* Ex. 1004 (Senoh), ¶[0043] ("The content server 3 then generates and sends catalog data for the content to the relay server 2 in order to market the content to a wider audience. The catalog data could contain previews of content highlights . . . ."), ¶[0044] ("[T]he relay server 2 is a server computer accessible from the network and storing a compiled product catalog of plural catalog data entries."). These different previews associated with the difference catalog entries (e.g., as shown in FIG. 4) are ***received and stored in*** relay server and constitute ***items of digital content to be made available for use in wireless communication devices used by a plurality of wireless services subscribers***. Ex. 1002 (Reddy Decl.), ¶¶76, 110.
[8Bii]	including receiving a plurality of different implementations of at least one of the items of content, where each implementation of any given item of content corresponds to a different set of device capabilities; and	While Senoh teaches receiving a plurality of items of content as discussed with respect to Limitation [1Aii], Senoh does not describe a download manager that performs a function of ***receiving a plurality of different implementations of at least one of the items of content, where each implementation of any given item of content corresponds to a different set of device capabilities***. Senoh is silent about how to ensure that a variety of different user terminals having different viewing requirements can view the various previews in the catalog. Ex. 1002 (Reddy Decl.), ¶93.

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	Claim	Prior Art Disclosures
		A solution for this is found in Agraharam. Agraharam teaches ***receiving a plurality of different implementations of at least one of the items of content, where each implementation of any given item of content corresponds to a different set of device capabilities.*** Agraharam teaches that "information source 108" (also called a "multimedia information source 108") is the source of information in the system. *See* Ex. 1005 (Agraharam), 2:39, 2:53-55 ("[T]he network information delivery device 110 retrieves the multimedia information, for example, from the information source 108 . . ."), 4:31-33 ("The network information delivery device 110 may retrieve the requested information from information sources such as information source 108 . . . ."). The multimedia information stored in the multimedia information source 108 "maybe formatted into predetermined formats for efficient delivery to the end-user." Ex. 1005 (Agraharam), 4:39-43. > For example, FIG. 4 shows multimedia information 402, 404 and 406 being formatted in a plurality of formats such as format-1 to format-4. Format-1 to format-4 may be formats such as "Audio Video Interleave" (AVI) (Microsoft's 'Video for Windows' standard) or "QuickTime." Thus, as shown in FIG. 4, multimedia information 402 is formatted in at least format-1 408 and format-2 410; multimedia information 404 is formatted in at least format-1 412 and format-3 414 and multimedia information 406 is formatted in at least format-2 416 and format-4 418. Cases that require formats other than the predetermined formats may be handled by formatting the information "on-the-fly" to ensure optimal information delivery to, and reproduction by the end-user terminal 114. Ex. 1005 (Agraharam), 4:44-57. The different items of content disclosed by Agraharam are shown as 402, 404, and 406, and the different implementations are shown as "Format-1" through "Format-4" (408, 410, 412, 414, 416, and 418), as illustrated below:

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	Claim	Prior Art Disclosures
		FIG. 4  *Id.*, FIG. 4. Agraharam teaches that these different items of information and their respective implementations "from information sources such as information source 108 may be deposited in the information delivery database" maintained by the information delivery device 110, thereby reducing network traffic. Ex. 1005 (Agraharam), 4:60-67. These different implementations represent "predetermined formats" and are provided to the user terminals based on the capabilities of the end-user terminals. *See* Ex. 1005, 4:35-39 ("Because end-users obtain end-user terminal capabilities by purchasing equipment that is available on the market, end-user terminal requirements can be grouped which allows information such as multimedia information to be preformatted into predetermined formats."). Thus, the different implementations of the items of content described by Agraharam correspond to different sets of device capabilities associated with different user terminals. Ex. 1002 (Reddy Decl.), ¶¶79-84, 111. Based on Agraharam, it would have been obvious to modify Senoh's catalog such that it received ***a plurality of different implementations of at least one of the items of content,***

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	Claim	Prior Art Disclosures
		where each implementation of any given item of content corresponds to a different set of device capabilities. A POSITA would have looked to Agraharam for several reasons. First, the POSITA would have understood that different devices having different capabilities for viewing multimedia content like Senoh's previews needed to have the data delivered in certain formats to display well on the devices. Ex. 1002 (Reddy Decl.), ¶¶39-44, 92; Ex. 1004 (Senoh), ¶[0008] ("A problem arises . . . when the specifications of the distributed content differ from the specifications of content that is viewable on the user's terminal or monitor, resulting in the user being unable to enjoy the content."); Ex. 1005 (Agraharam), ("[I]f none of the predetermined formats are suitable for information reproduction by the user terminal, the user terminal reproduces the information in an undesirable manner."). A POSITA would have been motivated to perform a step of receiving preview data in different implementations corresponding to different devices that access Senoh's catalog, and storing that data with other catalog data at the relay server, so that a wide variety of devices can preview the content from the catalog, thus further disseminating the content to a variety of users, as desired by Senoh. Ex. 1004 (Senoh), ¶[0043]. Second, a POSITA knew that content creators wanted to have control over how the different versions of their content displayed on devices. Ex. 1002 (Reddy Decl.), ¶96; Ex. 1008 (Britton), p.156 ("The primary advantages of static transcoding are quality of presentation and performance.[] Each page is constructed by a human designer, generally working with tools that show how the application will look or sound and thus allowing the presentation to be hand-tailored for each environment."). To provide content creators the ability to control the appearance of different implementations of their content, the POSITA would have seen a benefit to having the content server maintain different, preformatted implementations of the previews, and provide those to Senoh's relay server to market the content to a wider audience. Ex. 1002 (Reddy Decl.), ¶96; Ex. 1004 (Senoh), ¶[0044] (catalog for marketing to wider audience). Third, a POSITA knew that latency in viewing content on the Web affected the user experience. Ex. 1002 (Reddy Decl.), ¶97. Thus, using the same transcoding processes that

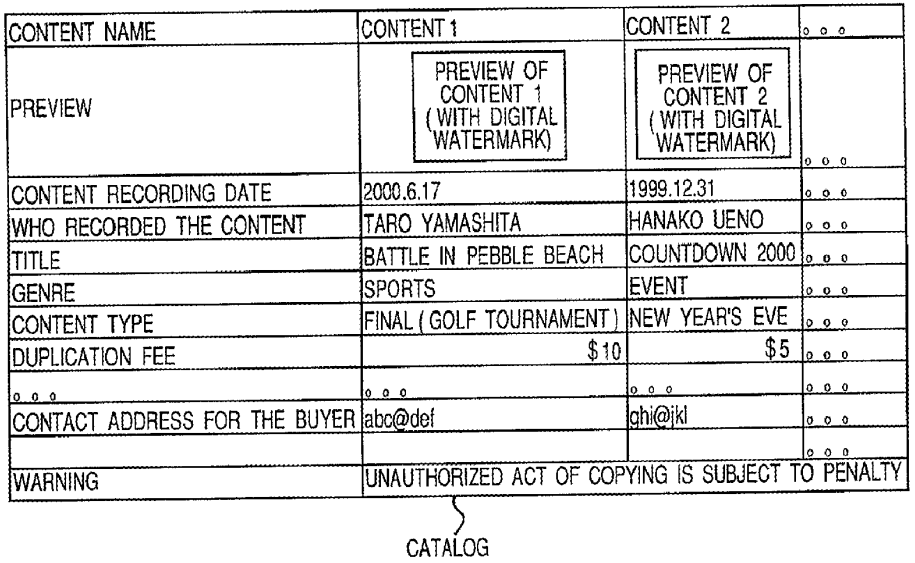
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	Claim	Prior Art Disclosures
		Senoh uses for purchased full-length content would have been unattractive for Senoh's previews. Ex. 1002 (Reddy Decl.), ¶95. A POSITA would have understood from Senoh that content in the catalog originated from different content creators/copyright holders. Ex. 1002 (Reddy Decl.), ¶97. Specifically, Senoh explains that the copyright holder and content server computers could be the same machines, Ex. 1004 (Senoh), ¶[0032], that each copyright holder receives a unique ID, *id.*, ¶[0034], and that the relay server stores a catalog with content from multiple copyright holders, *id.*, ¶[0054], FIG. 5; Ex. 1002 (Reddy Decl.), ¶97. Therefore, to implement a system where the content server maintains the previews until requested would have caused the content to be fetched when the catalog data was requested, sent to the relay server, transcoded at the relay server, and sent to the user terminal, from each of the content servers that provided catalog content. This would have added latency to the system, resulting in a potentially frustrating user experience that could lead to the perception that the service was poor quality. Ex. 1002 (Reddy Decl.), ¶97. Therefore, transcoding the preview content in advance like Agraharam does would have been seen as a way to reduce latency for resource intensive audio and video content like Senoh's previews. *Id.* And, while users might be willing to wait for content to be transcoded after they pay for it and await its delivery, users may be less tolerant of delays while viewing a number of different previews in the catalog while browsing for something they may want to buy. *Id.* Thus, the POSITA would have been led to look to Agraharam for a solution to the problem of ensuring content was delivered to devices in a format they could properly view. Fourth, storing multiple implementations of an item of content (previews) is one of a finite number of predictable solutions available to the POSITA for enabling content to be tailored to the user terminals requesting Senoh's previews. Ex. 1002 (Reddy Decl.), ¶98. Indeed, besides receiving and storing different implementations of items of content, one implementation could be received and transcoded at the relay server; implementations may be transcoded on the fly from a single implementation, or, contrary to Senoh's teachings, the catalog content could be kept at content servers and either transcoded there statically or dynamically. *Id.*. These solutions all had predictable results as the concepts of "static" transcoding and "dynamic" transcoding were discussed in the literature and had known implications. *See, e.g.*, Ex. 1008, pp.154-157.

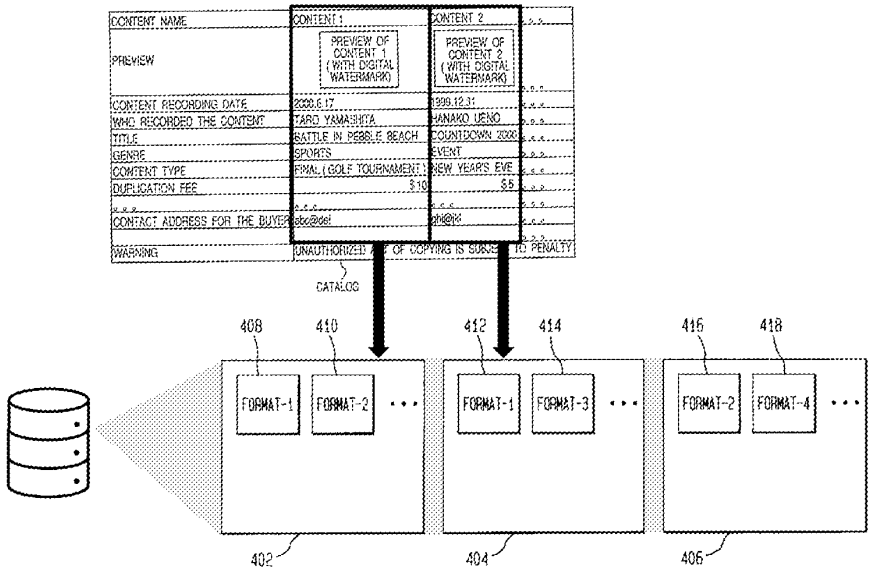
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	Claim	Prior Art Disclosures
		A POSITA would have been motivated to perform a step of receiving preview data in different implementations corresponding to different devices that access Senoh's catalog so that a wide variety of devices can preview the content from the catalog, thus further disseminating the content to a variety of users, as desired by Senoh. Ex. 1004 (Senoh), ¶[0043] (explaining that the catalog is for marketing "content to a wider audience"); Ex. 1002 (Reddy Decl.), ¶94. Applying Agraharam's technique of encoding different implementations of items of content and storing them in a database/repository at an information delivery device 110 to the storage of previews in Senoh's relay server would have merely applied a known technique to Senoh's known system, which was ready for improvement. Ex. 1002 (Reddy Decl.), ¶100. Furthermore, Agraharam provides a known solution to a problem apparent in Senoh's catalog system—namely that the catalog previews would be viewable on only certain terminals because they were not transcoded into different formats for a variety of user terminals. *Id.*. Applying Agraharam's technique to Senohs' previews thus transcoding the data into different formats for different terminal capabilities would have merely yielded the predictable results of better ensuring that user terminals could view the preview content on their terminals and support a broad range of terminal types and capabilities. *Id.*, ¶100. The POSITA would have had a reasonable expectation of succeeding in combining the teachings of Agraharam and Senoh to provide for receipt and storage of multiple implementations of the previews because it provides a known simple technique to provide multimedia content to diverse device types in an efficient manner. Ex. 1002 (Reddy Decl.), ¶101.
[8Biii]	maintain a product catalog containing a description of the items of content, the product catalog including, in association with each item of content, a reference to each	Senoh teaches ***maintaining a product catalog containing a description of items of content***. Specifically, Senoh explains that "content server 3 . . generates and sends catalog data for content to the relay server 2 in order to market the content to a wider audience." Ex. 1004 (Senoh), ¶[0043]. "[T]he relay server 2 is a server computer accessible from the network and storing a compiled catalog of plural catalog data entries." *Id.*, ¶[0044]. "A sample catalog compiling plural catalog data entries is shown in FIG. 4." *Id.*, ¶[0045].

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	Claim	Prior Art Disclosures
	implementation of said item of content.	*Fig.4*  Ex. 1004 (Senoh), FIG. 4. Senoh's ***product catalog*** includes ***descriptions of items of content*** because provides for information such as title, a preview, genre, etc., *See* Ex. 1004 (Senoh), ¶[0044]; FIG. 4. But, Senoh does not explicitly disclose that the product catalog includes ***in association with each item of content, a reference to each implementation of said item of content.*** Based on the combined teachings of Senoh and Agraharam, it would have been obvious to have a reference ***to each implementation of each item of content as recited in this claim***. Specifically, as explained above, it would have been obvious to receive and store various implementations of each item of content at Senoh's relay server so that the previews of the content could be accessed and provided to as many end-users via their terminals as possible. *See above*, *Limitation [1Aii]*. Based on this modification, Senoh's catalog would reference not only each item of content stored in the relay server database,

	Claim	Prior Art Disclosures
		but also each implementation of each item of content, as illustrated below. *See* Ex. 1002 (Reddy Decl.), ¶¶87-89, 112.



Ex. 1002 (Reddy Decl.), ¶88. Thus, in the combined Senoh-Agraharam system, Senoh's catalog includes a reference to each implementation of said item of content. For instance Senoh's "Content 1" refers to item of content 402, and each implementation of that item of content (i.e., items 408 and 410). Ex. 1002 (Reddy Decl.), ¶88.

It would have been obvious to implement Senoh's catalog to refer to each implementation of said item of content because it would permit the selection of specific items of content from the catalog in a manner that allows the system to provide the desired content to the user in a format that was best-suited for the user's terminal by enabling the system to determine which implementation (i.e., which format) is appropriate for the user terminal, as contemplated by both Senoh and Agraharam. Ex. 1004 (Senoh), ¶[0059] ("If the format

	Claim	Prior Art Disclosures
		of the content sent to the relay server 2 differs from the format required by the user terminal 1, the relay server 2 converts the received format to the format viewable by the user terminal 1, and then transmits the content to the user terminal 1."); Ex. 1005 (Agraharam), 4:27-30 ("[T]he network information delivery device 110 can automatically determine the best information delivery parameters required for effective delivery of the information requested by the end-user."). A POSITA would have thus been motivated to associate references to the stored implementations of the items of the content and thus references to each implementation of the items of content with the listings of those items of content in the catalog because it would have allowed the combined system to provide requested content to the end-user in a format that is viewable by the end-user on their terminal. Ex. 1002 (Reddy Decl.), ¶¶102-104. And, the POSITA would have reasonably anticipated success in making the combination to include references to each implementation because such references allowed access to stored content and had been routinely used to access databases to retrieve content based on the references well before the '790 patent. *Id.*, ¶104.

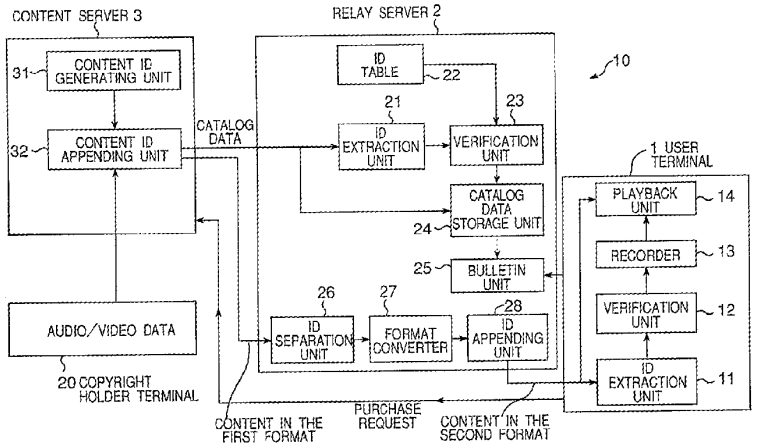
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APPENDIX B

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SNQ2: U.S. Patent Application Publication No. 2002/0078178 A1 to Senoh ("Senoh," Ex. 1004) in view of U.S. Patent No. 6,421,726 to Kenner ("Kenner," Ex. 1006) renders claims 1-2, 4, 8-9, and 11 obvious.

Senoh is prior art under pre-AIA 35 U.S.C. § 102(e) because it was filed in the United States on August 27, 2001 and published on June 20, 2002. Kenner is prior art under 35 U.S.C. § 102(e) because it was filed on March 1, 1998.

	Claim	Prior Art Disclosures
[1P]	A method of providing access to content for use on wireless communication devices, the method comprising:	The preamble is not a limitation of the claim. However, even if the preamble is interpreted as being a limitation of the claim, Senoh discloses a method of providing access to content for use on wireless communication devices. Senoh discloses ***wireless communication devices*** because it discloses cellular user terminals that include cellular phones. Ex. 1002, ¶¶ 73, 115. Specifically, Senoh teaches a "user terminal 1" that accesses a relay server 2 which receives and stores catalog data related to various items of multimedia content. This is illustrated in Senoh Figure 2 (below). *Fig.2*  Ex. 1004 (Senoh), FIG. 2.

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	Claim	Prior Art Disclosures
		The "user terminal" can be a "cellular phone." Ex. 1004 (Senoh), ¶¶[0060], [0074] ("The user terminal 1 could be a personal computer, cellular phone, or television or video deck having a communication function."). As Senoh explains "[i]t will be obvious to one with ordinary skill in the related art that while only one user terminal 1 is shown in the figure, plurality user terminals can be connected." Ex. 1004 (Senoh), ¶[0029]; *see also* Ex. 1002 (Reddy Decl.), ¶74, 115; Ex. 1006 (Kenner), 8:26-28 ("Only three user terminals are shown; however, it should be recognized that the number of concurrent users of the invention is unlimited, such to the operational details set forth below."). Senoh further describes a ***method of providing access to content for use on the wireless communication devices.*** Senoh discloses a method of ***providing access to content*** in the form of previews of content through an online catalog. For example, Senoh explains that the "content server 3 . . . generates and sends catalog data for the content to the relay server 2 in order to market the content to a wider audience." Ex. 1004 (Senoh), ¶[0043]. When the content is video content, "the relay server 2 preferably enables the content highlights to be previewed." *Id.*, ¶[0044]. Users can "select desired content by accessing the bulletin board on the relay server 2 and viewing the catalog." *Id.*, ¶[0045]. This content is accessible to the user for use on wireless communication devices through the "common bulletin board" which includes a product catalog. Ex. 1004 (Senoh), ¶[0045].
[1Ai]	receiving and storing a plurality of items of content to be made available for use in wireless communication devices used by a plurality of wireless services subscribers,	Senoh discloses and renders obvious ***receiving and storing a plurality of items of content to be made available for use in wireless communication devices used by a plurality of wireless services subscribers***. Senoh teaches ***receiving and storing a plurality of items of content*** in the relay server in because Senoh's relay server receives previews of the content made available from copyright holders using Senoh's system. An example of content stored in the relay server (2) disclosed in Senoh is provided in Figure 4 (below).

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	Claim	Prior Art Disclosures
		Fig.4

CONTENT NAME	CONTENT 1	CONTENT 2	...
PREVIEW	PREVIEW OF CONTENT 1 (WITH DIGITAL WATERMARK)	PREVIEW OF CONTENT 2 (WITH DIGITAL WATERMARK)	...
CONTENT RECORDING DATE	2000.6.17	1999.12.31	...
WHO RECORDED THE CONTENT	TARO YAMASHITA	HANAKO UENO	...
TITLE	BATTLE IN PEBBLE BEACH	COUNTDOWN 2000	...
GENRE	SPORTS	EVENT	...
CONTENT TYPE	FINAL (GOLF TOURNAMENT)	NEW YEAR'S EVE	...
DUPLICATION FEE	$10	$5	...
...	...	...	...
CONTACT ADDRESS FOR THE BUYER	abc@def	ghi@jkl	...
			...
WARNING	UNAUTHORIZED ACT OF COPYING IS SUBJECT TO PENALTY		

CATALOG

Ex. 1004 (Senoh), FIG. 4 (showing previews displayed in product catalog). This figure shows "[a] sample catalog compiling plural catalog entries," from which users can "select desired content by accessing [a] bulletin board on the relay server 2 and viewing the catalog." *Id.*, ¶[0045]. Thus, the relay server stores "a compiled catalog of plural catalog data entries." *Id.*, ¶[0044]. Content stored at relay server includes previews of audio or video data: "If the content contains video, the relay server 2 preferably enables the content highlights to be previewed. If the content is audio (music), a selection of a particular length could be provided as a preview." Ex. 1004 (Senoh), ¶[0044]; *see also id.*, FIG. 4. Here, a first item of content is "Preview of Content 1" and a second item of content is "Preview of Content 2" and thus are ***a plurality of items of content*** which are to be made available to user terminals including ***wireless communication devices used by a plurality of wireless services subscribers***. Ex. 1002 (Reddy Decl.), ¶¶76-77, 115.

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	Claim	Prior Art Disclosures
		These ***plurality of items of content*** are provided from Senoh's content server 3 and are ***received*** by, and ***stored*** in, the relay server. *See* Ex. 1004 (Senoh), ¶[0043] ("The content server 3 then generates and sends catalog data for the content to the relay server 2 in order to market the content to a wider audience. The catalog data could contain previews of content highlights . . . ."), ¶[0044] ("[T]he relay server 2 is a server computer accessible from the network and storing a compiled product catalog of plural catalog data entries."). These different previews associated with the difference catalog entries (e.g., as shown in FIG. 4) are ***received and stored in*** relay server and constitute ***items of digital content to be made available for use in wireless communication devices used by a plurality of wireless services subscribers***. Ex. 1002 (Reddy Decl.), ¶¶78 (citing Ex. 1011, 2:5-7 and explaining that wireless services for cellular phones were provided as a subscription service using, for example, Subscriber Identity Modules in cellular phones), 116.
[1Aii]	including receiving a plurality of different implementations of at least one of the items of content, where each implementation of any given item of content correspondents to a different set of device capabilities; and	This limitation would have been obvious over Senoh in view of Kenner. While Senoh describes how items of content (e.g., video and audio previews) are received and stored at the relay server, Senoh does not disclose a mechanism for ensuring that various user terminals can view the previews from the catalog if the capabilities of those terminals differ. Ex. 1002 (Reddy Decl.), ¶117. Senoh thus does not disclose ***receiving and storing a plurality of different implementations of at least one of the items of digital content, where each implementation of any given item of content corresponds to a different set of device capabilities*** to allow wider access to Senoh's catalog previews. A POSITA would have looked for a technique to ensure that the user terminals had the proper CODEC installed to allow the terminal to view or listen to the preview and would have found a solution in Kenner. Ex. 1002 (Reddy Decl.), ¶¶133-138. Kenner teaches "[a] system and method for the selection and retrieval of various types of video data from distributed delivery sites . . . ." Ex. 1006 (Kenner), Abstract. Kenner's "Smart Mirror" sites "maintains copies of . . . data in several alternative file formats," and "[t]he appropriate file format is automatically selected based on the capabilities of a user terminal making a request for data." *Id.* Kenner explains that ensuring that a codec for decoding multimedia is the appropriate codec to allow viewing of the media "can be difficult, time-consuming, or inconvenient." Ex. 1006 (Kenner), 2:26-29. "If a user is forced to download a

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	Claim	Prior Art Disclosures
		CODEC program before he can play a video file, he may be discouraged from pursuing that particular video request any further." *Id.*, 2:29-32. Kenner further explains that > Since video delivery over the Internet has quickly gained in popularity, a need exists for a system that can make sure that a user's video request can, in most cases, be satisfied by video clip stored in a compression format recognized by a CODEC on the user's terminal, thereby eliminating or reducing the user's need to download a new CODEC program. Ex. 1006 (Kenner), 5:48-54. Kenner thus uses a "format selection scheme . . . to automatically select a video clip file compressed in a format recognized by a CODEC program already installed and operative on a user terminal." *Id.*, 6:1-4. > A Web page hosting an embedded video clip also includes code to activate the Smart Mirroring and format selection schemes. Accordingly, a video clip selection and retrieval system according to the invention stores each video clip at various locations in a number of different compression formats. A format selection module comprises software programs that instruct the user terminal to determine which CODEC programs are installed at a user terminal, select a preferred CODEC for use, locate video clips stored in a compression format recognized by the preferred CODEC, and redirect or modify a video request so the video delivery system can locate and retrieve the desired clip. Where no appropriate CODEC is detected, the format selection module prompts the user to download and install a preferred CODEC. > In a first embodiment of the format selection module, a video clip is stored in a number of different compression formats at individual delivery sites connected to the Internet. The video clip and its address are referenced on a Web page providing access to the

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	Claim	Prior Art Disclosures
		server. The Web page also contains an embedded software program for querying the user terminal to determine what CODECs are installed at the terminal. The embedded program is automatically executed when the user requests a video clip which is referenced on the Web page. If the query detects the presence of a CODEC that can decompress a video clip stored by one of the servers, the embedded program will select that CODEC and request the appropriate video clip. Ex. 1006 (Kenner), 7:14-40. The invention is capable of selecting a preferred file format from a plurality of available formats. Accordingly, the storage module 27 of the first delivery site 26 (FIG. 1) includes storage for a plurality of video clips in different formats. Four clips 116-119 are shown, although any number can be used under the system and method of the invention. Ex. 1006 (Kenner), 18:6-13. Based on the foregoing, Kenner describes method including ***receiving and storing a plurality of different implementations of at least one of the items of digital content*** by explaining that "a video clip selection and retrieval system according to the invention stores each video clip at various locations in a number of different compression formats." *Id.*, 7:16-19, 7:28-30. As Kenner explains, different formats correspond to different ***device capabilities***: "The appropriate file format is automatically selected based on the capabilities of a user terminal making a request for data." Ex. 1006 (Kenner), Abstract. And, even if Kenner did not explicitly disclose receiving the different implementations, it would have been obvious to receive them from the source of the content after transcoding of the data into different formats to give the content creator maximum control over the look of the content on various devices in various formats, as explained in more detail below. Ex. 1002 (Reddy Decl.), ¶[142.

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	Claim	Prior Art Disclosures
		A POSITA would have found it obvious to use Kenner's system for retrieving content of a particular format keyed to the device capabilities of the requesting device in connection with Senoh's catalog including video. As explained above, Senoh teaches an online catalog for browsing multimedia content. Ex. 1004 (Senoh), ¶¶[0043]-[0044]. The catalog can include previews of the audio or video. *Id.*, ¶[0044]. Yet, Senoh does not explain how the multimedia previews would have been viewed on the user terminal. Nor does Senoh provide a discussion of how to ensure that the end-user's terminal can play the audio or video preview from the catalog. The POSITA would have looked to Kenner for several reasons. First, the POSITA would have understood that different devices having different capabilities for viewing multimedia content like Senoh's previews needed to have the data delivered in certain formats to display well on the devices. Ex. 1002 (Reddy Decl.), ¶¶39-44, 130; Ex. 1004 (Senoh), ¶[0008] ("A problem arises . . . when the specifications of the distributed content differ from the specifications of content that is viewable on the user's terminal or monitor, resulting in the user being unable to enjoy the content."). A POSITA would have been motivated to perform a step of receiving preview data in different implementations corresponding to different devices that access Senoh's catalog, and storing that data with other catalog data at the relay server, so that a wide variety of devices can preview the content from the catalog, thus further disseminating the content to a variety of users, as desired by Senoh. Ex. 1004 (Senoh), ¶[0043]; Ex. 1002 (Reddy Decl.), ¶132. Second, a POSITA knew that latency in viewing content on the Web affected the user experience. Ex. 1002 (Reddy Decl.), ¶137. Thus, using the same transcoding processes that Senoh uses for purchased full-length content would have been unattractive for Senoh's previews. Ex. 1002 (Reddy Decl.), ¶137. A POSITA would have understood from Senoh that content in the catalog originated from different content creators/copyright holders. Ex. 1002 (Reddy Decl.), ¶137. Specifically, Senoh explains that the copyright holder and content server computers could be the same machines, Ex. 1004 (Senoh), ¶[0032], that each copyright holder receives a unique ID, *id.*, ¶[0034], and that the relay server stores a catalog with content from multiple copyright holders, *id.*, ¶[0054], FIG. 5; Ex. 1002 (Reddy Decl.), ¶137. Therefore, to implement a system where the content server maintains the previews until requested would have caused the content to be fetched when the catalog data was requested,

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	Claim	Prior Art Disclosures
		sent to the relay server, transcoded at the relay server, and sent to the user terminal, from each of the content servers that provided catalog content. This would have added latency to the system, resulting in a potentially frustrating user experience that could lead to the perception that the service was poor quality. Ex. 1002 (Reddy Decl.), ¶138. Therefore, transcoding the preview content in advance like Agraharam does would have been seen as a way to reduce latency for resource intensive audio and video content like Senoh's previews. *Id.* And, while users might be willing to wait for content to be transcoded after they pay for it and await its delivery, users may be less tolerant of delays while viewing a number of different previews in the catalog while browsing for something they may want to buy. *Id.* Thus, the POSITA would have been led to look to Kenner for a solution to the problem of ensuring content was delivered to devices in a format they could properly view. *Id.* Third, storing multiple implementations of an item of content (previews) is one of a finite number of predictable solutions available to the POSITA for enabling content to be tailored to the user terminals requesting Senoh's previews. Ex. 1002 (Reddy Decl.), ¶139. Indeed, besides receiving and storing different implementations of items of content, one implementation could be received and transcoded at the relay server; implementations may be transcoded on the fly from a single implementation, or, contrary to Senoh's teachings, the catalog content could be kept at content servers and either transcoded there statically or dynamically. *Id.*. These solutions all had predictable results as the concepts of "static" transcoding and "dynamic" transcoding were discussed in the literature and had known implications. *See, e.g.*, Ex. 1008, pp.154-157. The POSITA would have seen that Kenner provides a mechanism for storing multimedia content at a server which hosts a webpage in which the content is embedded and which ensures that the end-user's terminal can play the content back. Ex. 1002 (Reddy), ¶134. Kenner explains that servers can store "a plurality of video clips in different formats." Ex. 1006 (Kenner), 18:8-11. In the context of Senoh's catalog, the POSITA would have understood that the first step in viewing the catalog included loading a web page such that a browser or other software on the user terminal could view the catalog data. As illustrated in Senoh's FIG. 4, the webpage would include one or more links to audio or video content in the form of previews of the items of content. *See* Ex. 1004 (Senoh), FIG. 4. Loading a webpage with embedded video data is also described by Kenner. *See* Ex. 1006 (Kenner),

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	Claim	Prior Art Disclosures
		18:32-33 ("First, the Web page containing the video clip is loaded by the user terminal (step 120)."). To ensure that the user terminal's browser can view the video, a POSITA would have found it obvious to employ Kenner's embedded script, which "specifies a sequence of preferred CODECs and corresponding video clip format types." Ex. 1006 (Kenner), 18:33-39; Ex. 1002 (Reddy Decl.), ¶136. Based on the execution of this script, "a URL is created from the storage location of the video clip" on the server. *Id.*, 18:48-50. Then, the appropriate file format extension is appended to it to allow the identification of a format of the file that can be played back on the user terminal. *Id.*, 18:51-61 ("Note that the created URL does not have a format type extension. The created URL is then modified (step 130) by appending a format type extension (e.g. ".mpg" for MPEG-formatted clips, or ".avi" for Microsoft Video for Windows-formatted clips) to the location of the video clip. The format type extension used depends on the selected CODEC. The resulting URL (e.g. "http://www.deliverysite.com/clips/watchme.mpg") uniquely specifies a video clip file in a format recognized by the preferred CODEC installed on the user terminal."). A POSITA would have been motivated to use techniques disclosed by Kenner in connection with the catalog of Senoh because it would have allowed the preview content to be played by various user terminals having different capabilities through the automatic selection of content that can be played by the terminal. Ex. 1002 (Reddy Decl.), ¶140. This would have minimized user frustration in either not being able to view certain content or having to locate and install a particular codec to play the one version of content stored at the server location. Ex. 1002 (Reddy Decl.), ¶139. The use of Kenner's known technique to allow the system to automatically correlate pre-stored video having particular formats with user terminals capable of playing that content would have merely applied a known technique to Senoh's catalog and would have yielded only predictable results of allowing a diverse set of devices with different codes to view the previews of the content items through the catalog site. Ex. 1002 (Reddy Decl.), ¶140. The POSITA would have looked to Kenner to provide a technique that allowed the system to correlate between installed CODECs on client terminals and available implementations of the items of content. Ex. 1002 (Reddy Decl.), ¶141. Because the interrelated techniques were taught in detail in the prior art, and the art was predictable and well-understood, the POSITA would have had a reasonable expectation of success in

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	Claim	Prior Art Disclosures
		combining Senoh's relay server and catalog with Kenner's technique for ensuring that user terminals could view video files. Ex. 1002 (Reddy Decl.), ¶143. Moreover, even if it was contended that Kenner did not teach receiving and storing the different implementations of the items of content, it would have been obvious to have the content creators produce the items of content and send them to the relay server such that are received and stored in the compiled catalog disclosed by Senoh. Ex. 1002 (Reddy Decl.), ¶142; Ex. 1008, p.156. This is because content creators would have wanted to have control over the transcoding of their content, and storing that content with the remainder of the catalog data would have improved the speed at which it could be delivered to the end-user. *Id.* This would have improved the marketability of the system and content. *Id.*
[1B]	maintaining a product catalog containing a description of the items of content, the product catalog including, in association with each item of content, a reference to each implementation of said item of content.	Senoh teaches ***maintaining a product catalog containing a description of the items of content***. Senoh, however, does not explicitly teach that the product catalog includes ***in association with each item of content, a reference to each implementation of said item of content***. Senoh explains that "content server 3 . . generates and sends catalog data for content to the relay server 2 in order to market the content to a wider audience." Ex. 1004 (Senoh), ¶[0043]. "[T]he relay server 2 is a server computer accessible from the network and storing a compiled catalog of plural catalog data entries." *Id.*, ¶[0044]. "A sample catalog compiling plural catalog data entries is shown in FIG. 4." *Id.*, ¶[0045].

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	Claim	Prior Art Disclosures

Fig.4

CONTENT NAME	CONTENT 1	CONTENT 2	...
PREVIEW	PREVIEW OF CONTENT 1 (WITH DIGITAL WATERMARK)	PREVIEW OF CONTENT 2 (WITH DIGITAL WATERMARK)	...
CONTENT RECORDING DATE	2000.6.17	1999.12.31	...
WHO RECORDED THE CONTENT	TARO YAMASHITA	HANAKO UENO	...
TITLE	BATTLE IN PEBBLE BEACH	COUNTDOWN 2000	...
GENRE	SPORTS	EVENT	...
CONTENT TYPE	FINAL (GOLF TOURNAMENT)	NEW YEAR'S EVE	...
DUPLICATION FEE	$10	$5	...
...	...	...	...
CONTACT ADDRESS FOR THE BUYER	abc@def	ghi@jkl	...
			...
WARNING	UNAUTHORIZED ACT OF COPYING IS SUBJECT TO PENALTY		

CATALOG

Ex. 1004 (Senoh), FIG. 4.

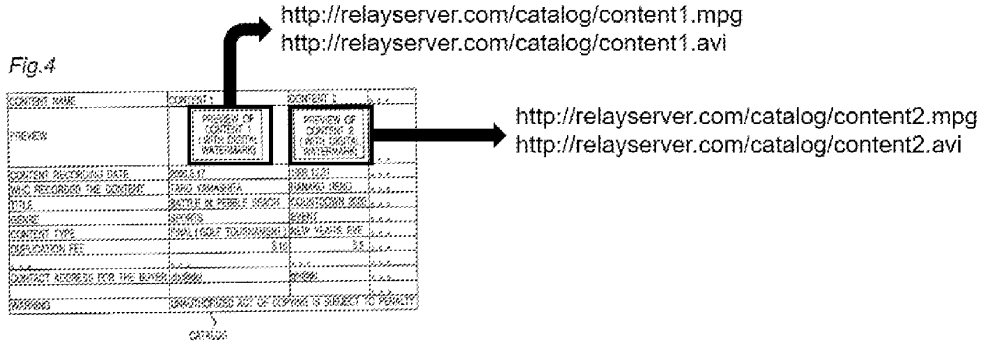
Senoh's ***product catalog*** includes references to items of content because it allows the user to view previews of the content. Ex. 1004 (Senoh), ¶¶[0043]-[0044].

Senoh does not explicitly teach that the product catalog ***includes, in association with each item of digital content, a reference to each implementation of said item of digital content***. But, this feature would have been obvious over the combined teachings of Senoh and Kenner. As explained in connection with *Limitation [2Aii]*, above, it would have been obvious to store multiple implementations (formats) of Senoh's preview content at Senoh's relay server based on the teachings of Kenner. In doing so, a POSITA would have further found it obvious to include ***a reference to each implementation of said item of digital content*** through use of

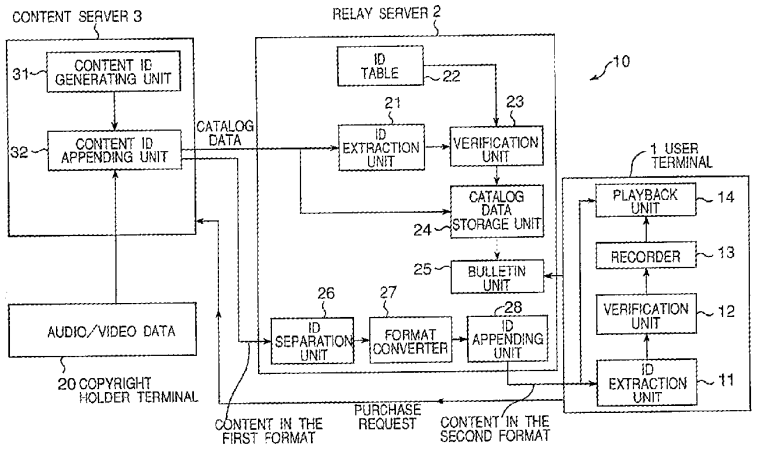
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	Claim	Prior Art Disclosures
		a directory structure on the relay server. Ex. 1002 (Reddy Decl.), ¶125-127. As taught by Kenner if an acceptable codec is installed on the end-user's terminal, "a URL is created from the storage location of the video clip (step 128)." Ex. 1006 (Kenner), 18:48-50. "For example, such a created URL might be "http://deliverysite.com/clips/watchme." *Id.*, 18:48-51. But, this URL is missing the "format type extension," such as ".mpg" or ".avi." *Id.*, 18:50-56. In implementing Senoh's product catalog, including, for example, previews of video content using Kenner's techniques, each preview would be stored in a particular directory associated with that preview (e.g., /clips/watchme in the context of Kenner's example). Ex. 1002 (Reddy Decl.), ¶125. The directory structure including /clips/watchme" is a reference to each implementation of the digital content called "watchme" because it unambiguously identifies all the files stored in that directory with the name "watchme." Ex. 1002 (Reddy Decl.), ¶125. In other words, /clips/watchme is the directory in which each implementation of watchme is stored including watchme.mpg and watchme.avi. *Id.* As explained above, a POSITA would have found it obvious to use Kenner's technique to ensure that devices requesting content from Senoh's relay server had a CODEC installed that would allow the user of the device to view (or listen to) the preview from the catalog. *See Limitation [1Aii]*. In implementing the combined Senoh-Kenner system, to access an individual implementation for a particular item of content (e.g., video or audio preview), the POSITA would have understood that Kenner's technique uses a directory name to explicitly reference each of the implementations stored in that directory and further includes a reference based on the file name. Ex. 1002 (Reddy Decl.), ¶¶125,. Thus, to implement the combined Senoh-Kenner system, the POSITA would have understood that references such as "catalog/content1" and "catalog/content2" provided a reference to each implementation of the item of digital content, thus allowing the specific implementations required by the client terminal to be accessed by appending the correct file extension to the name. Ex. 1002 (Reddy Decl.), ¶¶126, 144.

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	Claim	Prior Art Disclosures
		 For the reasons explained above, it would have been obvious to use Kenner's techniques for serving multimedia content that can be viewed by a user's terminal. *See Limitation [2Aii].* And this would have included using the technique for storing different formats and accessing those formats from, for example, a browser on the user's terminal by addressing the content using Kenner's techniques and including references to those different implementations of content to ensure that the correct version is served to the user's terminal. Ex. 1002 (Reddy Decl.), ¶129-144.
[2P]	A method of providing access to digital content for use on wireless communication devices, the method comprising:	The preamble is not a limitation of the claim. However, even if the preamble is interpreted as being a limitation of the claim, Senoh discloses a method of providing access to content for use on wireless communication devices. Senoh discloses ***wireless communication devices*** because it discloses cellular user terminals that include cellular phones. Ex. 1002, ¶73, 146. Specifically, Senoh teaches a "user terminal 1" that accesses a relay server 2 which receives and stores catalog data related to various items of digital content—namely multimedia data such as audio or video. Ex. 1004 (Senoh), ¶¶[0043]-[0044]. This is illustrated in Senoh Figure 2 (below).

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	Claim	Prior Art Disclosures
		Fig.2  Ex. 1004 (Senoh), FIG. 2. The "user terminal" can be a "cellular phone." Ex. 1004 (Senoh), ¶¶[0060], [0074] ("The user terminal 1 could be a personal computer, cellular phone, or television or video deck having a communication function."). As Senoh explains "[i]t will be obvious to one with ordinary skill in the related art that while only one user terminal 1 is shown in the figure, plurality user terminals can be connected." Ex. 1004 (Senoh), ¶[0029]; Ex. 1002 (Reddy Decl.), ¶¶74, 146; Ex. 1006 (Kenner), 8:26-28 ("Only three user terminals are shown; however, it should be recognized that the number of concurrent users of the invention is unlimited, such to the operational details set forth below.")). Senoh further describes a ***method of providing access to content for use on the wireless communication devices.*** Ex. 1002 (Reddy Decl.), ¶¶74, 146. Senoh discloses a method of ***providing access to content*** in the form of previews of content through an online catalog. For example, Senoh explains that the "content server 3 . . . generates and sends catalog data for the content to the relay server 2 in order to market the content to a wider audience." Ex.

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	Claim	Prior Art Disclosures
		1004 (Senoh), ¶[0043]. When the content is video content, "the relay server 2 preferably enables the content highlights to be previewed." *Id.*, ¶[0044]. Users can "select desired content by accessing the bulletin board on the relay server 2 and viewing the catalog." *Id.*, ¶[0045]. This content is accessible to the user for use on wireless communication devices through the "common bulletin board" which includes a product catalog. Ex. 1004 (Senoh), ¶[0045].
[2Ai]	receiving and storing in a server system a plurality of items of digital content to be made available for use in wireless communication devices used by a plurality of wireless services subscribers,	Senoh discloses and renders obvious ***receiving . . . a plurality of items of content to be made available for use in wireless communication devices used by a plurality of wireless services subscribers***. The functionality performed by Senoh's relay server is performed ***in a server system*** and when items of content and their implementations are stored in a database of relay server 2, the steps of ***receiving and storing*** are performed ***in a server system***. Ex. 1002 (Reddy Decl.), ¶147. Senoh teaches ***receiving and storing a plurality of items of content*** in the relay server in because Senoh's relay server receives previews of the content made available from copyright holders using Senoh's system. An example of content stored in the relay server (2) disclosed in Senoh is provided in Figure 4 (below).

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	Claim	Prior Art Disclosures

Fig.4

CONTENT NAME	CONTENT 1	CONTENT 2	...
PREVIEW	PREVIEW OF CONTENT 1 (WITH DIGITAL WATERMARK)	PREVIEW OF CONTENT 2 (WITH DIGITAL WATERMARK)	...
CONTENT RECORDING DATE	2000.6.17	1999.12.31	...
WHO RECORDED THE CONTENT	TARO YAMASHITA	HANAKO UENO	...
TITLE	BATTLE IN PEBBLE BEACH	COUNTDOWN 2000	...
GENRE	SPORTS	EVENT	...
CONTENT TYPE	FINAL (GOLF TOURNAMENT)	NEW YEAR'S EVE	...
DUPLICATION FEE	$10	$5	...
...	...	...	...
CONTACT ADDRESS FOR THE BUYER	abc@def	ghi@jkl	...
			...
WARNING	UNAUTHORIZED ACT OF COPYING IS SUBJECT TO PENALTY		

CATALOG

Ex. 1004 (Senoh), FIG. 4 (showing previews displayed in product catalog). This figure shows "[a] sample catalog compiling plural catalog entries," from which users can "select desired content by accessing [a] bulletin board on the relay server 2 and viewing the catalog." *Id.*, ¶[0045]. The catalog data is generated by and sent from the content server 3 to the relay server 2. *See* Ex. 1004 (Senoh), ¶¶[0043] ("The content server 3 then generates and sends catalog data for the content to the relay server 2 in order to market the content to a wider audience."), [0044] ("[T]he relay server 2 is a server computer accessible from the network and storing a compiled catalog of plural catalog data entries."). This allows the relay server to store "a compiled catalog of plural catalog data entries." *Id.*, ¶[0044]. Content stored at relay server includes previews of audio or video data. "If the content contains video, the relay server 2 preferably enables the content highlights to be previewed. If the content is audio (music), a selection of a particular length could be provided as a preview." Ex. 1004 (Senoh),

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	Claim	Prior Art Disclosures
		¶[0044]; *see also id.*, FIG. 4. Here, a first item of content is "Preview of Content 1" and a second item of content is "Preview of Content 2" and thus are ***a plurality of items of content*** which are to be made available to user terminals including ***wireless communication devices used by a plurality of wireless services subscribers***. Ex. 1002 (Reddy Decl.), ¶¶76-77, 147. These ***plurality of items of content*** are provided from Senoh's content server 3 and are ***received*** by, and ***stored*** in, the relay server. *See* Ex. 1004 (Senoh), ¶[0043] ("The content server 3 then generates and sends catalog data for the content to the relay server 2 in order to market the content to a wider audience. The catalog data could contain previews of content highlights . . . ."), ¶[0044] ("[T]he relay server 2 is a server computer accessible from the network and storing a compiled product catalog of plural catalog data entries."). These different previews associated with the difference catalog entries (e.g., as shown in FIG. 4) are ***received and stored in*** relay server and constitute ***items of digital content to be made available for use in wireless communication devices used by a plurality of wireless services subscribers***. Ex. 1002 (Reddy Decl.), ¶¶78, 147 (citing Ex. 1011, 2:5-7 and explaining that wireless services for cellular phones were provided as a subscription service using, for example, Subscriber Identity Modules in cellular phones), 116.
[2Aii]	including receiving and storing a plurality of different implementations of at least one of the items of digital content, where each implementation of any given item of digital content corresponds to a different set of device capabilities;	This limitation would have been obvious over Senoh in view of Kenner. While Senoh describes how items of content (e.g., video and audio previews) are received at the relay server, Senoh does not disclose a mechanism for ensuring that various user terminals can view the previews from the catalog if the capabilities of those terminals differs. In connection with the catalog previews Senoh does not disclose ***receiving and storing a plurality of different implementations of at least one of the items of digital content, where each implementation of any given item of content corresponds to a different set of device capabilities*** to allow wider access to Senohs' catalog previews. A POSITA would have looked for a technique to ensure that the user terminals had the proper CODEC installed to allow the terminal to view or listen to the preview and would have found a solution in Kenner. Ex. 1002 (Reddy Decl.), ¶¶133-138, 148. Kenner teaches a technique to ensure that the end-user terminal making the request for previews from the catalog receives the preview in a format that the terminal can decode and display. Specifically, Kenner teaches "[a] system and method for the selection and retrieval

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	Claim	Prior Art Disclosures
		of various types of video data from distributed delivery sites . . . ." Ex. 1006 (Kenner), Abstract. Kenner's "Smart Mirror" sites "maintains copies of . . . data in several alternative file formats," and "[t]he appropriate file format is automatically selected based on the capabilities of a user terminal making a request for data." *Id.* Kenner explains that ensuring that a codec for decoding multimedia is the appropriate codec to allow viewing of the media "can be difficult, time-consuming, or inconvenient." Ex. 1006 (Kenner), 2:26-29. "If a user is forced to download a CODEC program before he can play a video file, he may be discouraged from pursuing that particular video request any further." *Id.*, 2:29-32. Kenner further explains that > Since video delivery over the Internet has quickly gained in popularity, a need exists for a system that can make sure that a user's video request can, in most cases, be satisfied by video clip stored in a compression format recognized by a CODEC on the user's terminal, thereby eliminating or reducing the user's need to download a new CODEC program. Ex. 1006 (Kenner), 5:48-54. Kenner thus uses a "format selection scheme . . . to automatically select a video clip file compressed in a format recognized by a CODEC program already installed and operative on a user terminal." *Id.*, 6:1-4. > A Web page hosting an embedded video clip also includes code to activate the Smart Mirroring and format selection schemes. Accordingly, a video clip selection and retrieval system according to the invention stores each video clip at various locations in a number of different compression formats. A format selection module comprises software programs that instruct the user terminal to determine which CODEC programs are installed at a user terminal, select a preferred CODEC for use, locate video clips stored in a compression format recognized by the preferred CODEC, and redirect or modify a video request so the video delivery system can locate and retrieve the desired clip. Where no

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	Claim	Prior Art Disclosures
		appropriate CODEC is detected, the format selection module prompts the user to download and install a preferred CODEC. In a first embodiment of the format selection module, a video clip is stored in a number of different compression formats at individual delivery sites connected to the Internet. The video clip and its address are referenced on a Web page providing access to the server. The Web page also contains an embedded software program for querying the user terminal to determine what CODECs are installed at the terminal. The embedded program is automatically executed when the user requests a video clip which is referenced on the Web page. If the query detects the presence of a CODEC that can decompress a video clip stored by one of the servers, the embedded program will select that CODEC and request the appropriate video clip. Ex. 1006 (Kenner), 7:14-40. The invention is capable of selecting a preferred file format from a plurality of available formats. Accordingly, the storage module 27 of the first delivery site 26 (FIG. 1) includes storage for a plurality of video clips in different formats. Four clips 116-119 are shown, although any number can be used under the system and method of the invention. Ex. 1006 (Kenner), 18:6-13. Based on the foregoing, Kenner describes method including ***receiving and storing a plurality of different implementations of at least one of the items of digital content*** by explaining that "a video clip selection and retrieval system according to the invention stores each video clip at various locations in a number of different compression formats." *Id.*, 7:16-19, 7:28-30. As Kenner explains, different formats correspond to different ***device capabilities***: "The appropriate file format is automatically

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	Claim	Prior Art Disclosures
		selected based on the capabilities of a user terminal making a request for data." Ex. 1006 (Kenner), Abstract. A POSITA would have found it obvious to use Kenner's system for retrieving content of a particular format keyed to the device capabilities of the requesting device in connection with Senoh's catalog including video. As explained above, Senoh teaches an online catalog for browsing multimedia content. Ex. 1004 (Senoh), ¶¶[0043]-[0044]. The catalog can include previews of the audio or video. *Id.*, ¶[0044]. Yet, Senoh does not explain how the multimedia previews would have been viewed on the user terminal. Nor does Senoh provide a discussion of how to ensure that the end-user's terminal can play the audio or video preview from the catalog. A POSITA would have looked for a technique to ensure that the user terminals had the proper CODEC installed to allow the terminal to view or listen to the preview and would have found a solution in Kenner. Ex. 1002 (Reddy Decl.), ¶¶133-138, 157. The POSITA would have looked to Kenner for several reasons. First, the POSITA would have understood that different devices having different capabilities for viewing multimedia content like Senoh's previews needed to have the data delivered in certain formats to display well on the devices. Ex. 1002 (Reddy Decl.), ¶¶39-44, 130, 157; Ex. 1004 (Senoh), ¶[0008] ("A problem arises . . . when the specifications of the distributed content differ from the specifications of content that is viewable on the user's terminal or monitor, resulting in the user being unable to enjoy the content."). A POSITA would have been motivated to perform a step of receiving preview data in different implementations corresponding to different devices that access Senoh's catalog, and storing that data with other catalog data at the relay server, so that a wide variety of devices can preview the content from the catalog, thus further disseminating the content to a variety of users, as desired by Senoh. Ex. 1004 (Senoh), ¶[0043]; Ex. 1002 (Reddy Decl.), ¶1¶32, 157. Second, a POSITA knew that latency in viewing content on the Web affected the user experience. Ex. 1002 (Reddy Decl.), ¶¶137, 157. Thus, using the same transcoding processes that Senoh uses for purchased full-length content would have been unattractive for Senoh's previews. Ex. 1002 (Reddy Decl.), ¶¶137, 157. A POSITA would have understood from Senoh that content in the catalog originated from different content creators/copyright holders. Ex. 1002 (Reddy Decl.), ¶¶137, 157. Specifically, Senoh explains that the copyright holder

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	Claim	Prior Art Disclosures
		and content server computers could be the same machines, Ex. 1004 (Senoh), ¶[0032], that each copyright holder receives a unique ID, *id.*, ¶[0034], and that the relay server stores a catalog with content from multiple copyright holders, *id.*, ¶[0054], FIG. 5; Ex. 1002 (Reddy Decl.), ¶¶137, 157. Therefore, to implement a system where the content server maintains the previews until requested would have caused the content to be fetched when the catalog data was requested, sent to the relay server, transcoded at the relay server, and sent to the user terminal, from each of the content servers that provided catalog content. This would have added latency to the system, resulting in a potentially frustrating user experience that could lead to the perception that the service was poor quality. Ex. 1002 (Reddy Decl.), ¶¶138, 157. Therefore, transcoding the preview content in advance like Agraharam does would have been seen as a way to reduce latency for resource intensive audio and video content like Senoh's previews. *Id.* And, while users might be willing to wait for content to be transcoded after they pay for it and await its delivery, users may be less tolerant of delays while viewing a number of different previews in the catalog while browsing for something they may want to buy. *Id.* Thus, the POSITA would have been led to look to Kenner for a solution to the problem of ensuring content was delivered to devices in a format they could properly view. *Id.* Third, storing multiple implementations of an item of content (previews) is one of a finite number of predictable solutions available to the POSITA for enabling content to be tailored to the user terminals requesting Senoh's previews. Ex. 1002 (Reddy Decl.), ¶139. Indeed, besides receiving and storing different implementations of items of content, one implementation could be received and transcoded at the relay server; implementations may be transcoded on the fly from a single implementation, or, contrary to Senoh's teachings, the catalog content could be kept at content servers and either transcoded there statically or dynamically. *Id.*. These solutions all had predictable results as the concepts of "static" transcoding and "dynamic" transcoding were discussed in the literature and had known implications. *See, e.g.*, Ex. 1008, pp.154-157. The POSITA would have seen that Kenner provides a mechanism for storing multimedia content at a server which hosts a webpage in which the content is embedded and which ensures that the end-user's terminal can play the content back. Ex. 1002 (Reddy), ¶¶ 134,

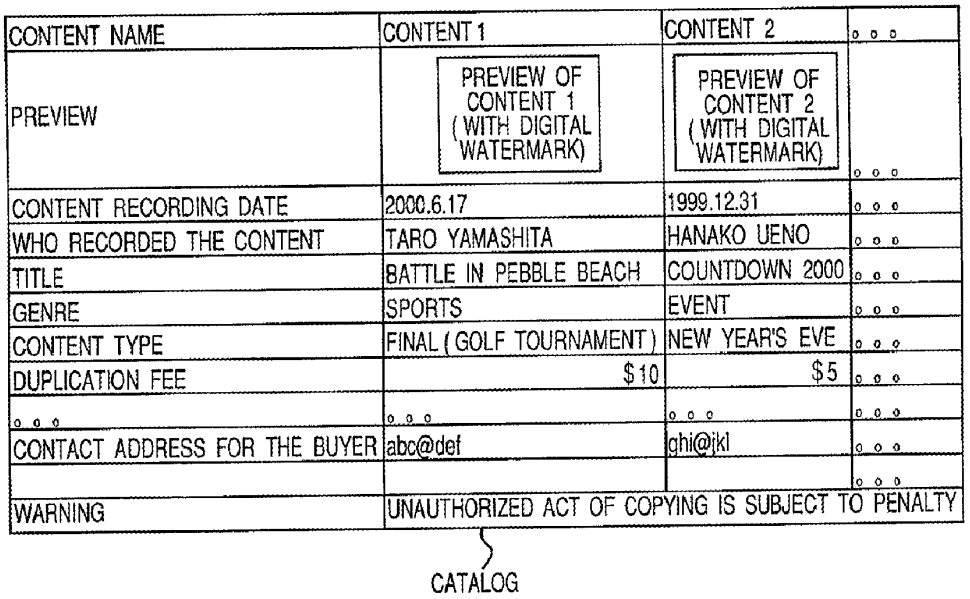
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	Claim	Prior Art Disclosures
		157. Kenner explains that servers can store "a plurality of video clips in different formats." Ex. 1006 (Kenner), 18:8-11. In the context of Senoh's catalog, the POSITA would have understood that the first step in viewing the catalog included loading a web page such that a browser or other software on the user terminal could view the catalog data. As illustrated in Senoh's FIG. 4, the webpage would include one or more links to audio or video content in the form of previews of the items of content. *See* Ex. 1004 (Senoh), FIG. 4. Loading a webpage with embedded video data is also described by Kenner. *See* Ex. 1006 (Kenner), 18:32-33 ("First, the Web page containing the video clip is loaded by the user terminal (step 120)."). To ensure that the user terminal's browser can view the video, a POSITA would have found it obvious to employ Kenner's embedded script, which "specifies a sequence of preferred CODECs and corresponding video clip format types." Ex. 1006 (Kenner), 18:33-39. Based on the execution of this script, "a URL is created from the storage location of the video clip" on the server. *Id.*, 18:48-50. Then, the appropriate file format extension is appended to it to allow the identification of a format of the file that can be played back on the user terminal. *Id.*, 18:51-61 ("Note that the created URL does not have a format type extension. The created URL is then modified (step 130) by appending a format type extension (e.g. ".mpg" for MPEG-formatted clips, or ".avi" for Microsoft Video for Windows-formatted clips) to the location of the video clip. The format type extension used depends on the selected CODEC. The resulting URL (e.g. "http://www.deliverysite.com/clips/watchme.mpg") uniquely specifies a video clip file in a format recognized by the preferred CODEC installed on the user terminal."). A POSITA would have been motivated to use techniques disclosed by Kenner in connection with the catalog of Senoh because it would have allowed the preview content to be played by various user terminals having different capabilities through the automatic selection of content that can be played by the terminal. Ex. 1002 (Reddy Decl.), ¶¶140, 157. This would have minimized user frustration in either not being able to view certain content or having to locate and install a particular codec to play the one version of content stored at the server location. Ex. 1002 (Reddy Decl.), ¶139, 157. The use of Kenner's known technique to allow the system to automatically correlate pre-stored video having particular formats with user terminals capable of playing that content would have merely applied a known technique to Senoh's catalog and would have yielded only predictable results of allowing a diverse set of

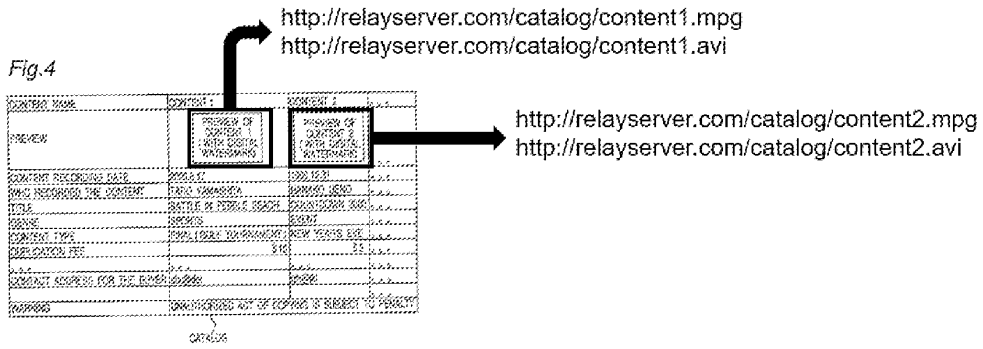
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	Claim	Prior Art Disclosures
		devices with different codes to view the previews of the content items through the catalog site. Ex. 1002 (Reddy Decl.), ¶140, 157. The POSITA would have looked to Kenner to provide a technique that allowed the system to correlate between installed CODECs on client terminals and available implementations of the items of content. Ex. 1002 (Reddy Decl.), ¶¶141, 157. Because the interrelated techniques were taught in detail in the prior art, and the art was predictable and well-understood, the POSITA would have had a reasonable expectation of success in combining Senoh's relay server and catalog with Kenner's technique for ensuring that user terminals could view video files. Ex. 1002 (Reddy Decl.), ¶¶143, 157. Moreover, even if it was contended that Kenner did not teach receiving and storing the different implementations of the items of content, it would have been obvious to have the content creators produce the items of content and send them to the relay server such that are received and stored in the compiled catalog disclosed by Senoh. Ex. 1002 (Reddy Decl.), ¶¶142, 157; Ex. 1008, p.156. This is because content creators would have wanted to have control over the transcoding of their content, and storing that content with the remainder of the catalog data would have improved the speed at which it could be delivered to the end-user. *Id.* This would have improved the marketability of the system and content. *Id.*
[2B]	operating the server system to maintain a product catalog containing a description of the items of digital content wherein the product catalog includes, in association with each item of digital content, a reference to each implementation of said item of digital content;	Senoh's relay server—i.e., a ***server system***—is operated to ***maintain a product catalog containing a description of the items of digital content***. Specifically, Senoh explains that "content server 3 . . generates and sends catalog data for content to the relay server 2 in order to market the content to a wider audience." Ex. 1004 (Senoh), ¶[0043]. "[T]he relay server 2 is a server computer accessible from the network and storing a compiled catalog of plural catalog data entries." *Id.*, ¶[0044]. "A sample catalog compiling plural catalog data entries is shown in FIG. 4." *Id.*, ¶[0045].

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	Claim	Prior Art Disclosures
		Fig.4  CONTENT NAME | CONTENT 1 | CONTENT 2 | ... PREVIEW | PREVIEW OF CONTENT 1 (WITH DIGITAL WATERMARK) | PREVIEW OF CONTENT 2 (WITH DIGITAL WATERMARK) CONTENT RECORDING DATE | 2000.6.17 | 1999.12.31 WHO RECORDED THE CONTENT | TARO YAMASHITA | HANAKO UENO TITLE | BATTLE IN PEBBLE BEACH | COUNTDOWN 2000 GENRE | SPORTS | EVENT CONTENT TYPE | FINAL (GOLF TOURNAMENT) | NEW YEAR'S EVE DUPLICATION FEE | $10 | $5 ... | ... | ... CONTACT ADDRESS FOR THE BUYER | abc@def | ghi@jkl WARNING | UNAUTHORIZED ACT OF COPYING IS SUBJECT TO PENALTY CATALOG Ex. 1004 (Senoh), FIG. 4. Senoh's ***product catalog*** includes references to items of content because it allows users to View previews of the content. Ex. 1004, ¶[0043]-[0044]. Senoh does not explicitly teach that the product catalog ***includes, in association with each item of digital content, a reference to each implementation of said item of digital content***. But, this feature would have been obvious over the combined teachings of Senoh and Kenner. As explained in connection with *Limitation [2Aii]*, above, it would have been obvious to store multiple implementations (formats) of Senoh's preview content at Senoh's relay server based on the teachings of Kenner. In doing so, a POSITA would have further found it obvious to include ***a reference to each implementation of said item of digital content*** through use of

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	Claim	Prior Art Disclosures
		a directory structure on the relay server. Ex. 1002 (Reddy Decl.), ¶¶125-127, 149. As taught by Kenner if an acceptable codec is installed on the end-user's terminal, "a URL is created from the storage location of the video clip (step 128)." Ex. 1006 (Kenner), 18:48-50. "For example, such a created URL might be "http://deliverysite.com/clips/watchme." *Id.*, 18:48-51. But, this URL is missing the "format type extension," such as ".mpg" or ".avi." *Id.*, 18:50-56. In implementing Senoh's product catalog, including, for example, previews of video content using Kenner's techniques, each preview would be stored in a particular directory associated with that preview (e.g., /clips/watchme in the context of Kenner's example). Ex. 1002 (Reddy Decl.), ¶¶[125-127, 149. The directory structure including /clips/watchme" is a reference to each implementation of the digital content called "watchme." Ex. 1002 (Reddy Decl.), ¶125-127, 149. In other words, /clips/watchme is the directory in which each implementation of watchme is stored including watchme.mpg and watchme.avi. *Id.* A POSITA would have thus found obvious an implementation of Senoh's product catalog based on Kenner's techniques to have been obvious as illustrated below:  For the reasons explained above, it would have been obvious to use Kenner's techniques for serving multimedia content that can be viewed by a user's terminal. *See Limitation [2Aii].* And this would have included using the technique for storing different formats and accessing those formats from, for example, a browser on the user's terminal by addressing the content

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	Claim	Prior Art Disclosures
		using Kenner's techniques and including references to those different implementations of content to ensure that the correct version is served to the user's terminal. Ex. 1002 (Reddy Decl.), ¶129-144, 157.
[2C]	receiving a request from a wireless device used by one of the subscribers;	The combination of Senoh and Kenner render the step of ***receiving a request from a wireless device used by one of the subscribers*** obvious. In the combined Senoh-Kenner technique for serving appropriately formatted multimedia data associated with Senoh's product catalog to end-user terminals, a POSITA would have understood that once the format type is determined, a URL including the "format type extension" is "transmitted to the delivery site specified by the URL, and the clip is downloaded (step 132) and played (step 134)." Ex. 1006 (Kenner), 18:61-63; Ex. 1002 (Reddy Decl.), ¶151. The URL sent from the user terminal is received by Senoh's relay server in the combined Senoh-Kenner system, causing the preview having a file format that can be viewed by the user's terminal to be served to the end-user terminal in a format that can be viewed on that terminal. For the reasons explained above, a process including ***receiving a request from a wireless device used by one of the subscribers*** would have been obvious.
[2D]	in response to the request, selecting a portion of the product catalog to be presented to the subscriber, based on device capabilities of the wireless device used by the subscriber; and	The combination of Senoh and Kenner renders obvious ***in response to the request, selecting a portion of the product catalog to be presented to the subscriber, based on the capabilities of the wireless device used by the subscriber.*** As explained above in connection with *Limitation [2Aii]*, it would have been obvious to use the Kenner techniques in combination with Senoh's product catalog to ensure that properly formatted video and audio data are served from Senoh's relay server to user terminals viewing the product catalog previews. In the combined system, once a URL having the appropriate "format type extension" for a codec installed on the terminal is received, a portion of the product catalog is selected based on the device capabilities and is presented to the subscriber thus allowing the content to be downloaded and played. Ex. 1006 (Kenner), 18:61-65 ("This URL is then transmitted to the delivery site specified by the URL, and the clip is downloaded (step 132) and played (step 134). When the video clip file is received, the browser automatically invokes the proper CODEC for its display."); Ex. 1002 (Reddy Decl.), ¶154.

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	Claim	Prior Art Disclosures
		Thus, in response to the request—i.e., the URL including the correctly format type extension as taught by Kenner—a portion of the product catalog is selected from the relay server to be presented to the subscriber on their terminal. This selection is performed ***based on the device capabilities of the wireless device used by the subscriber*** because the format type extension is used to obtain the correctly formatted content from the server based on the codec installed at the terminal. Ex. 1006, 18:48-65; Ex. 1002 (Reddy Decl.), ¶154. And, only ***a portion of the product catalog*** is selected because the preview content is only provided in one format. *Id.*
[2E]	presenting the selected portion of the product catalog to the subscriber via a wireless network, such that the selected portion, as presented to the subscriber, provides only a single description of each item of digital content in said portion, regardless of the number of implementations of each said item.	The combination of Senoh and Kenner renders obvious ***presenting the selected portion of the product catalog to the subscriber via a wireless network, such that the selected portion, as presented to the subscriber, provides only a single description of each item of digital content in said portion, regardless of the number of implementations of each said item***. A subscriber using the cellular phone described by Senoh to view the product catalog including video previews, Ex. 1004, ¶¶[0044], [0060], [0074], in which the techniques of Kenner are used to select a preview in the appropriate format for viewing on the user terminal would be presented with ***the selected portion of the product catalog via a wireless network***. Ex. 1002, ¶156. Using the combined teachings of Senoh and Kenner, the ***selected portion, as presented to the subscriber, provides only a single description of each item of digital content in said portion, regardless of the number of implementations*** because, for example, the video preview would be presented on one format (e.g., .mpg) and not another available format (e.g., .avi) based on the available codec at the terminal. Ex. 1006 (Kenner), 18:48-67; Ex. 1002, ¶156. In other words, even when Senoh's product catalog refers to a .mpg and a .avi formatted version of a particular preview, only one of the formats will be returned for viewing of the preview using Kenner's techniques. Ex. 1002 (Reddy Decl.), ¶156. And, the description would not change regardless of how many different implementations of the previews are present in Senoh's product catalog data. *Id.*
[4P]	A method as recited in claim 2, further comprising:	*See* claim 2, above.
[4A]	receiving from the subscriber a request for one of the items	Senoh discloses or renders obvious a step of ***receiving from the subscriber a request for one of the items of digital content in said portion of the product catalog.***

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	Claim	Prior Art Disclosures
	of digital content in said portion of the product catalog;	Specifically, Senoh explains that a user can select an item of digital content from the catalog and request that it be delivered to their device. For instance, Senoh teaches: > A sample catalog compiling plural catalog data entries is shown in FIG. 4. The catalog can be posted to a common bulletin board (electronic bulletin board) accessible from the network. Users can then select desired content by accessing the bulletin board on the relay server 2 and viewing the catalog. It should be further noted that the content ID is also contained in the preview data extracted from the content. Ex. 1004 (Senoh), ¶[0045]. > The user terminal 1 is described next. The user terminal 1 is the terminal or computer whereby a user views the bulletin board 25 containing the catalog data, views previews of content from the catalog data on the bulletin board 25, and views or listens to the content. If there is content that the user wishes to purchase, the user sends a purchase request to the content provider (marketer or copyright holder of the content on the content server 3). This request contains the e-mail address or other information specifying the content provider or other party marketing the content. When the content server 3 receives such a purchase request, it sends a request for credit card information, electronic money, or other payment method to the user terminal 1. The content server 3 also requests the format supported by the user terminal 1 for viewing the content. *Id.*, ¶[0057]. Therefore, Senoh teaches and renders obvious ***receiving from the subscriber a request for one of the items of digital content in said portion of the product catalog***. Ex. 1002 (Reddy Decl.), ¶¶159-161.

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	Claim	Prior Art Disclosures
[4B]	selecting an implementation of the requested item of digital content, based on device capabilities of the wireless device used by the subscriber; and	Senoh discloses and renders obvious a step of ***selecting an implementation of the requested item of digital content, based on device capabilities of the wireless device used by the subscriber***. After the user provides a request for an item of content, "[t]he content server . . . requests the format supported by the user terminal 1 for viewing the content." Ex. 1004 (Senoh), ¶[0057]. Content is provided from the content server to the relay server, and then from the relay server to the user terminal. *Id.*, ¶¶[0058]-[0059]. The implementation of the content—i.e., the format—provided by the relay server 2 is selected based on the device capabilities (i.e., the "format supported by the user terminal 1 for viewing the content") of the wireless device used by the subscriber. Specifically, Senoh teaches: > If the format of the content sent to the relay server 2 differs from the format required by the user terminal 1, the relay server 2 converts the received format to the format viewable by the user terminal 1, and then transmits the content to the user terminal 1. The term "viewable" means that the user terminal 1 supports the format in which the content will be reproduced, or can display the content at the performance of the output display (the display performance of the monitor) of the user terminal 1. Ex. 1004 (Senoh), ¶[0059]. Therefore, a POSITA would have understood that Senoh teaches that an implementation of the content from content server is selected based on device capabilities (i.e., required format) for the wireless device. Ex. 1002 (Reddy Decl.), ¶163. For example, Senoh explains that content may be provided from content server in a format for HDTV, but may be downsampled to meet the requirements for a wireless device: > While the format specification includes the encoding method, resolution, and other parameters, a process for converting content in MPEG-2 main profile, high level format (such as HDTV format) to content in MPEG-4 simple profile, level 0 format (such as Quarter Common Intermediate Format (QCIF)) is used by way of

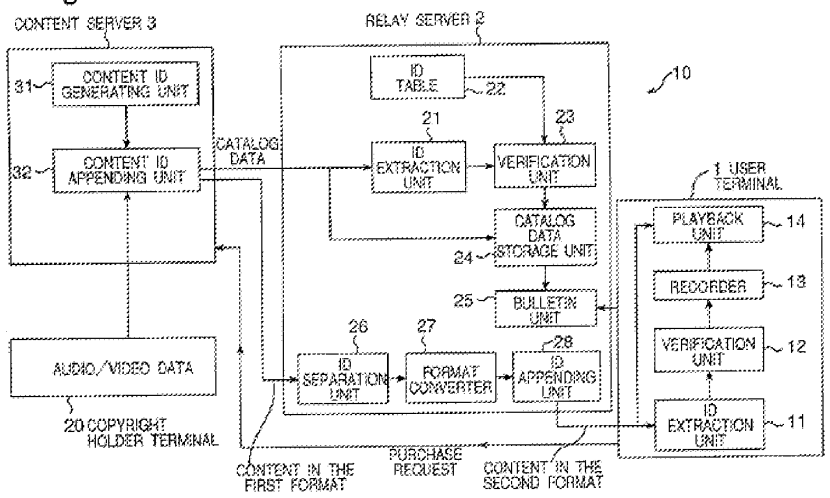
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	Claim	Prior Art Disclosures
		example. This conversion process enables the user to view content using a cellular phone or other user terminal 1 on which content cannot be viewed in the normal TV format. * * * * * The copyright holder produces MPEG-2 main profile, high level AV data conforming to the HDTV format, and sends this data to the content server **3**. The content ID appending unit **32** of the content server **3** generates content in first format by adding content ID as a digital watermark encrypted using a public key encryption scheme to the AV data. The content server **3** sends content in this first format to the relay server **2**. * * * * * The format converter 27 then downsamples the MPEG-2 main profile, high level format AV data obtained by the ID separation unit 26 to MPEG-4 simple profile, level 0 format AV data. Using the procedure described above for adding a digital watermark, the ID appending unit 28 of the relay server 2 then adds the extracted content ID to the converted AV data to output data formatted to the second format specification. The ID appending unit 28 sends the reformatted content to the user terminal 1 (FIG. 1). Ex. 1004 (Senoh), ¶¶[0060]-[0061], [0064].
[4C]	downloading the selected implementation of the item of digital content to the wireless device used by the subscriber.	Senoh discloses and renders obvious a step of ***downloading the selected implementation of the item of digital content to the wireless device used by the subscriber.*** Specifically, Senoh teaches that in response to the request for content from the end-user, the relay server downloads the implementation selected based on the format requirements of the device to the wireless device (i.e., cellular phone) used by the subscriber. *See, e.g.*, Ex. 1004 (Senoh), ¶¶[0058] ("If the format of the content received from the content server 3 is the same as format specified by the user, the relay server 2 simply sends the content directly to

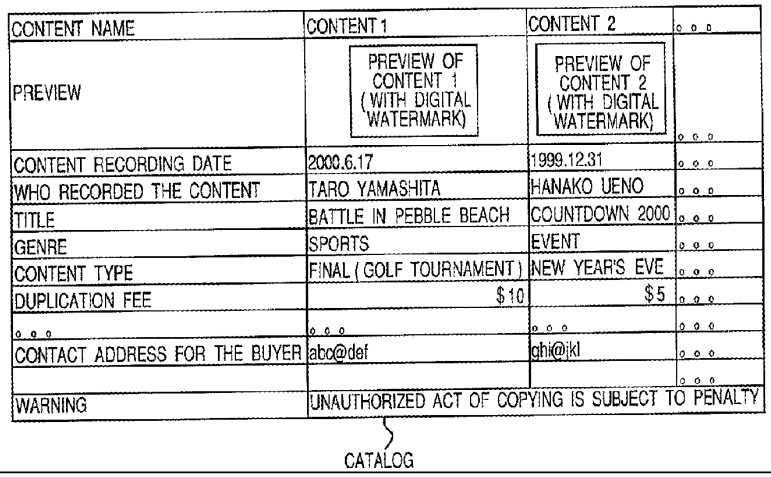
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	Claim	Prior Art Disclosures
		the user terminal 1."), [0059] ("If the format of the content sent to the relay server 2 differs from the format required by the user terminal 1, the relay server 2 converts the received format to the format viewable by the user terminal 1, and then transmits the content to the user terminal 1."), [0060] ("This conversion process enables the user to view content using a cellular phone or other user terminal 1 on which content cannot be viewed in the normal TV format."), [0073] ("The content can then be sent to the user terminal 1 so that the user can enjoy viewing the content while simultaneously appropriately protecting the copyright of the content owner."); *see also* Ex. 1002 (Reddy Decl.), ¶165.
[8P]	A system comprising:	The preamble is not a limitation of the claim. However, even if the preamble is interpreted as being a limitation of the claim, Senoh discloses a system, such as the content distribution system shown in FIG. 2. *See, e.g.*, Ex. 1004 (Senoh), ¶¶[0002] ("This invention relates to controlling an electronic distribution system for distributing digital multimedia content, including audio and video, by way of a network."), [0010] ("An object of this invention is therefore to provide an electronic distribution system . . . ."), [0030] ("The configuration of this content distribution system is described in greater detail below with reference to FIG. 2.").

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	Claim	Prior Art Disclosures
		Fig.2  Ex. 1004 (Senoh), FIG. 2; *see also* Ex. 1002 (Reddy Decl.), ¶167.
[8A]	a network interface through which to communicate over a communication network; and	Senoh discloses or renders obvious a ***network interface through which to communicate over a communication network***. Specifically, Senoh teaches that "[c]ontent distribution system 10 has a user terminal 1, relay server 2, and content server 3. The user terminal 1, relay server 2, and content server 3 are each connected to a communication network 4, such as the Internet through which they can communicate with each other." Ex. 1004 (Senoh), ¶[0029]. A POSITA would have understood that the interface between hardware connected to the network and the network itself is a network interface, and therefore would have appreciated that there is a network interface in each of the relay server, content server, and user terminal that allows data to be communicated from these systems over the network such as the Internet. Ex. 1002 (Reddy Decl.), ¶¶108, 168.
[8B]	a download manager to	Senoh discloses and renders obvious ***a download manager***. As used in the '790 Patent, the term "download manager" refers to an application server in the server system with the capabilities described below in *Limitations 8Bi-8Biii*. *See* Ex. 1001, 3:66-4:1 ("The server system includes an application server referred to herein as a 'download manager.'").

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	Claim	Prior Art Disclosures
		In Senoh, the claimed "download manager" is the relay server. *See, e.g.*, Ex. 1004 (Senoh), FIGS. 1 & 2; ¶¶[0029] ("The relay server 2 converts the content received form the content server 3 in the first format to a second format specification, and sends the reformatted content to the user terminal. 1."), [0043]-[0045] (describing catalog provided by relay server), [0046] (describing relay server). As explained in further detail below, a POSITA would have understood Senoh's relay server to constitute a download manager, and that the capabilities required by *Limitations 8B1-8Biii* would have been obvious over Senoh in view of Li. Ex. 1002 (Reddy Decl.), ¶¶109, 169.
[8Bi]	receive and store a plurality of items of content to be made available for use in wireless communication devices used by a plurality of wireless telecommunications subscribers,	Senoh discloses and renders obvious a download manager to ***receive and store a plurality of items of content to be made available for use in wireless communication devices used by a plurality of wireless telecommunications subscribers.*** Senoh teaches ***receiving and storing a plurality of items of content*** in the relay server in because Senoh's relay server receives previews of the content made available from copyright holders using Senoh's system. An example of content stored in the relay server (2) disclosed in Senoh is provided in Figure 4 (below). *Fig.4* 

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	Claim	Prior Art Disclosures
		Ex. 1004 (Senoh), FIG. 4 (showing previews displayed in product catalog). This figure shows "[a] sample catalog compiling plural catalog entries," from which users can "select desired content by accessing [a] bulletin board on the relay server 2 and viewing the catalog." *Id.*, ¶[0045]. Thus, the relay server stores "a compiled catalog of plural catalog data entries." *Id.*, ¶[0044]. Content stored at relay server includes previews of audio or video data: "If the content contains video, the relay server 2 preferably enables the content highlights to be previewed. If the content is audio (music), a selection of a particular length could be provided as a preview." Ex. 1004 (Senoh), ¶[0044]; *see also id.*, FIG. 4. Here, a first item of content is "Preview of Content 1" and a second item of content is "Preview of Content 2" and thus are ***a plurality of items of content*** which are to be made available to user terminals including ***wireless communication devices used by a plurality of wireless services subscribers***. Ex. 1002 (Reddy Decl.), ¶¶76-77, 170. These ***plurality of items of content*** are provided from Senoh's content server 3 and are ***received*** by, and ***stored*** in, the relay server. *See* Ex. 1004 (Senoh), ¶[0043] ("The content server 3 then generates and sends catalog data for the content to the relay server 2 in order to market the content to a wider audience. The catalog data could contain previews of content highlights . . . ."), ¶[0044] ("[T]he relay server 2 is a server computer accessible from the network and storing a compiled product catalog of plural catalog data entries."). These different previews associated with the difference catalog entries (e.g., as shown in FIG. 4) are ***received and stored in*** relay server and constitute ***items of digital content to be made available for use in wireless communication devices used by a plurality of wireless services subscribers***. Ex. 1002 (Reddy Decl.), ¶¶78 (citing Ex. 1011, 2:5-7 and explaining that wireless services for cellular phones were provided as a subscription service using, for example, Subscriber Identity Modules in cellular phones), 170.
[8Bii]	including receiving a plurality of different implementations of at least one of the items of content, where each implementation of any given item of content	This limitation would have been obvious over Senoh in view of Kenner. While Senoh describes how items of content (e.g., video and audio previews) are received at the relay server, Senoh does not disclose a mechanism for ensuring that various user terminals can view the previews from the catalog if the capabilities of those terminals differs. Ex. 1002 (Reddy Decl.), ¶¶117, 171. In connection with the catalog previews. In connection with the catalog multimedia content, Senoh does not explicitly disclose ***receiving a plurality of different implementations of at least one of the items of digital content*** (where the content

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	Claim	Prior Art Disclosures
	corresponds to a different set of device capabilities; and	is previews of full-length content)***, where each implementation of any given item of content corresponds to a different set of device capabilities.*** A POSITA would have looked for a technique to ensure that the user terminals had the proper CODEC installed to allow the terminal to view or listen to the preview and would have found a solution in Kenner. Ex. 1002 (Reddy Decl.), ¶¶133-138, 171. Kenner teaches "[a] system and method for the selection and retrieval of various types of video data from distributed delivery sites . . . ." Ex. 1006 (Kenner), Abstract. Kenner's "Smart Mirror" sites "maintains copies of . . . data in several alternative file formats," and "[t]he appropriate file format is automatically selected based on the capabilities of a user terminal making a request for data." *Id.* Kenner explains that ensuring that a codec for decoding multimedia is the appropriate codec to allow viewing of the media "can be difficult, time-consuming, or inconvenient." Ex. 1006 (Kenner), 2:26-29. "If a user is forced to download a CODEC program before he can play a video file, he may be discouraged from pursuing that particular video request any further." *Id.*, 2:29-32. Kenner further explains that > Since video delivery over the Internet has quickly gained in popularity, a need exists for a system that can make sure that a user's video request can, in most cases, be satisfied by video clip stored in a compression format recognized by a CODEC on the user's terminal, thereby eliminating or reducing the user's need to download a new CODEC program. Ex. 1006 (Kenner), 5:48-54. Kenner thus uses a "format selection scheme . . . to automatically select a video clip file compressed in a format recognized by a CODEC program already installed and operative on a user terminal." *Id.*, 6:1-4. > A Web page hosting an embedded video clip also includes code to activate the Smart Mirroring and format selection schemes. Accordingly, a video clip selection and retrieval system according to the invention stores each video clip at various locations in a number of different compression formats. A format selection

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	Claim	Prior Art Disclosures
		module comprises software programs that instruct the user terminal to determine which CODEC programs are installed at a user terminal, select a preferred CODEC for use, locate video clips stored in a compression format recognized by the preferred CODEC, and redirect or modify a video request so the video delivery system can locate and retrieve the desired clip. Where no appropriate CODEC is detected, the format selection module prompts the user to download and install a preferred CODEC. In a first embodiment of the format selection module, a video clip is stored in a number of different compression formats at individual delivery sites connected to the Internet. The video clip and its address are referenced on a Web page providing access to the server. The Web page also contains an embedded software program for querying the user terminal to determine what CODECs are installed at the terminal. The embedded program is automatically executed when the user requests a video clip which is referenced on the Web page. If the query detects the presence of a CODEC that can decompress a video clip stored by one of the servers, the embedded program will select that CODEC and request the appropriate video clip. Ex. 1006 (Kenner), 7:14-40. The invention is capable of selecting a preferred file format from a plurality of available formats. Accordingly, the storage module 27 of the first delivery site 26 (FIG. 1) includes storage for a plurality of video clips in different formats. Four clips 116-119 are shown, although any number can be used under the system and method of the invention.

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	Claim	Prior Art Disclosures
		Ex. 1006 (Kenner), 18:6-13. Based on the foregoing, Kenner describes method including ***receiving and storing a plurality of different implementations of at least one of the items of digital content*** by explaining that "a video clip selection and retrieval system according to the invention stores each video clip at various locations in a number of different compression formats." *Id.*, 7:16-19, 7:28-30. As Kenner explains, different formats correspond to different ***device capabilities***: "The appropriate file format is automatically selected based on the capabilities of a user terminal making a request for data." Ex. 1006 (Kenner), Abstract. And, even if Kenner did not explicitly disclose receiving the different implementations, it would have been obvious to receive them from the source of the content after transcoding of the data into different formats to give the content creator maximum control over the look of the content on various devices in various formats, as explained in more detail below. Ex. 1002 (Reddy Decl.), ¶¶[142, 171. A POSITA would have found it obvious to use Kenner's system for retrieving content of a particular format keyed to the device capabilities of the requesting device in connection with Senoh's catalog including video. As explained above, Senoh teaches an online catalog for browsing multimedia content. Ex. 1004 (Senoh), ¶¶[0043]-[0044]. The catalog can include previews of the audio or video. *Id.*, ¶[0044]. Yet, Senoh does not explain how the multimedia previews would have been viewed on the user terminal. Nor does Senoh provide a discussion of how to ensure that the end-user's terminal can play the audio or video preview from the catalog. The POSITA would have looked to Kenner for several reasons. First, the POSITA would have understood that different devices having different capabilities for viewing multimedia content like Senoh's previews needed to have the data delivered in certain formats to display well on the devices. Ex. 1002 (Reddy Decl.), ¶¶39-44, 130, 171, 173; Ex. 1004 (Senoh), ¶[0008] ("A problem arises . . . when the specifications of the distributed content differ from the specifications of content that is viewable on the user's terminal or monitor, resulting in the user being unable to enjoy the content."). A POSITA would have been motivated to perform a step of receiving preview data in different implementations corresponding to different devices that access Senoh's catalog, and storing that data with other catalog data at the relay server, so that a wide variety of devices can

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	Claim	Prior Art Disclosures
		preview the content from the catalog, thus further disseminating the content to a variety of users, as desired by Senoh. Ex. 1004 (Senoh), ¶[0043]; Ex. 1002 (Reddy Decl.), ¶¶132, 173. Second, a POSITA knew that latency in viewing content on the Web affected the user experience. Ex. 1002 (Reddy Decl.), ¶¶137, 173. Thus, using the same transcoding processes that Senoh uses for purchased full-length content would have been unattractive for Senoh's previews. Ex. 1002 (Reddy Decl.), ¶¶137, 173. A POSITA would have understood from Senoh that content in the catalog originated from different content creators/copyright holders. Ex. 1002 (Reddy Decl.), ¶¶137, 173. Specifically, Senoh explains that the copyright holder and content server computers could be the same machines, Ex. 1004 (Senoh), ¶[0032], that each copyright holder receives a unique ID, *id.*, ¶[0034], and that the relay server stores a catalog with content from multiple copyright holders, *id.*, ¶[0054], FIG. 5; Ex. 1002 (Reddy Decl.), ¶¶137, 173. Therefore, to implement a system where the content server maintains the previews until requested would have caused the content to be fetched when the catalog data was requested, sent to the relay server, transcoded at the relay server, and sent to the user terminal, from each of the content servers that provided catalog content. This would have added latency to the system, resulting in a potentially frustrating user experience that could lead to the perception that the service was poor quality. Ex. 1002 (Reddy Decl.), ¶¶138, 173. Therefore, transcoding the preview content in advance like Agraharam does would have been seen as a way to reduce latency for resource intensive audio and video content like Senoh's previews. *Id.* And, while users might be willing to wait for content to be transcoded after they pay for it and await its delivery, users may be less tolerant of delays while viewing a number of different previews in the catalog while browsing for something they may want to buy. *Id.* Thus, the POSITA would have been led to look to Kenner for a solution to the problem of ensuring content was delivered to devices in a format they could properly view. *Id.* Third, storing multiple implementations of an item of content (previews) is one of a finite number of predictable solutions available to the POSITA for enabling content to be tailored to the user terminals requesting Senoh's previews. Ex. 1002 (Reddy Decl.), ¶¶139, 173. Indeed, besides receiving and storing different implementations of items of content, one implementation could be received and transcoded at the relay server; implementations may

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	Claim	Prior Art Disclosures
		be transcoded on the fly from a single implementation, or, contrary to Senoh's teachings, the catalog content could be kept at content servers and either transcoded there statically or dynamically. *Id.*. These solutions all had predictable results as the concepts of "static" transcoding and "dynamic" transcoding were discussed in the literature and had known implications. *See, e.g.*, Ex. 1008, pp.154-157. The POSITA would have seen that Kenner provides a mechanism for storing multimedia content at a server which hosts a webpage in which the content is embedded and which ensures that the end-user's terminal can play the content back. Ex. 1002 (Reddy), ¶¶134, 173. Kenner explains that servers can store "a plurality of video clips in different formats." Ex. 1006 (Kenner), 18:8-11. In the context of Senoh's catalog, the POSITA would have understood that the first step in viewing the catalog included loading a web page such that a browser or other software on the user terminal could view the catalog data. As illustrated in Senoh's FIG. 4, the webpage would include one or more links to audio or video content in the form of previews of the items of content. *See* Ex. 1004 (Senoh), FIG. 4. Loading a webpage with embedded video data is also described by Kenner. *See* Ex. 1006 (Kenner), 18:32-33 ("First, the Web page containing the video clip is loaded by the user terminal (step 120)."). To ensure that the user terminal's browser can view the video, a POSITA would have found it obvious to employ Kenner's embedded script, which "specifies a sequence of preferred CODECs and corresponding video clip format types." Ex. 1006 (Kenner), 18:33-39; Ex. 1002 (Reddy Decl.), ¶136. Based on the execution of this script, "a URL is created from the storage location of the video clip" on the server. *Id.*, 18:48-50. Then, the appropriate file format extension is appended to it to allow the identification of a format of the file that can be played back on the user terminal. *Id.*, 18:51-61 ("Note that the created URL does not have a format type extension. The created URL is then modified (step 130) by appending a format type extension (e.g. ".mpg" for MPEG-formatted clips, or ".avi" for Microsoft Video for Windows-formatted clips) to the location of the video clip. The format type extension used depends on the selected CODEC. The resulting URL (e.g. "http://www.deliverysite.com/clips/watchme.mpg") uniquely specifies a video clip file in a format recognized by the preferred CODEC installed on the user terminal.").

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	Claim	Prior Art Disclosures
		A POSITA would have been motivated to use techniques disclosed by Kenner in connection with the catalog of Senoh because it would have allowed the preview content to be played by various user terminals having different capabilities through the automatic selection of content that can be played by the terminal. Ex. 1002 (Reddy Decl.), ¶¶140, 173. This would have minimized user frustration in either not being able to view certain content or having to locate and install a particular codec to play the one version of content stored at the server location. Ex. 1002 (Reddy Decl.), ¶¶139, 173. The use of Kenner's known technique to allow the system to automatically correlate pre-stored video having particular formats with user terminals capable of playing that content would have merely applied a known technique to Senoh's catalog and would have yielded only predictable results of allowing a diverse set of devices with different codes to view the previews of the content items through the catalog site. Ex. 1002, ¶140, 173. The POSITA would have looked to Kenner to provide a technique that allowed the system to correlate between installed CODECs on client terminals and available implementations of the items of content. Ex. 1002 (Reddy Decl.), ¶¶141, 173. Because the interrelated techniques were taught in detail in the prior art, and the art was predictable and well-understood, the POSITA would have had a reasonable expectation of success in combining Senoh's relay server and catalog with Kenner's technique for ensuring that user terminals could view video files. Ex. 1002 (Reddy Decl.), ¶¶143, 173. Moreover, even if it was contended that Kenner did not teach receiving and storing the different implementations of the items of content, it would have been obvious to have the content creators produce the items of content and send them to the relay server such that are received and stored in the compiled catalog disclosed by Senoh. Ex. 1002 (Reddy Decl.), ¶¶142, 173; Ex. 1008, p.156. This is because content creators would have wanted to have control over the transcoding of their content, and storing that content with the remainder of the catalog data would have improved the speed at which it could be delivered to the end-user. *Id.* This would have improved the marketability of the system and content. *Id.*
[8Biii]	maintain a product catalog containing a description of the items of content, the product catalog including, in association with each item of	Senoh teaches a download manager to ***maintain a product catalog containing a description of the items of content***. Senoh, however, does not explicitly teach that the product catalog includes ***in association with each item of content, a reference to each implementation of said item of content***. This latter aspect of the claim would have been obvious over Senoh in view of Kenner.

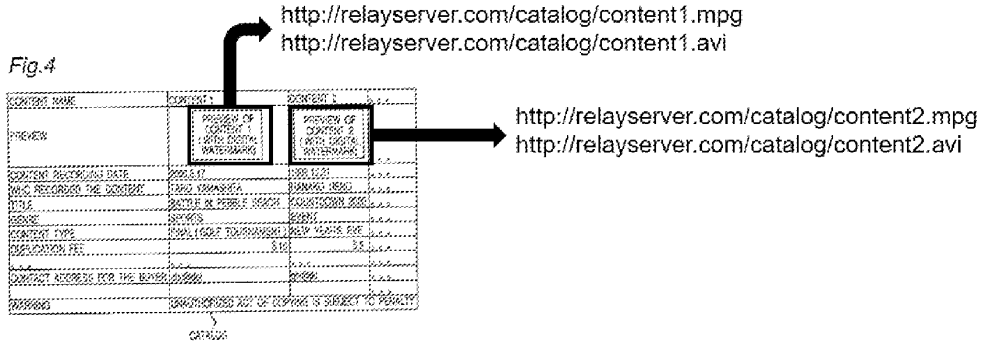
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	Claim	Prior Art Disclosures
	content, a reference to each implementation of said item of content.	Senoh explains that "content server 3 . . generates and sends catalog data for content to the relay server 2 in order to market the content to a wider audience." Ex. 1004 (Senoh), ¶[0043]. "[T]he relay server 2 is a server computer accessible from the network and storing a compiled catalog of plural catalog data entries." *Id.*, ¶[0044]. "A sample catalog compiling plural catalog data entries is shown in FIG. 4." *Id.*, ¶[0045]. *Fig.4* CONTENT NAME | CONTENT 1 | CONTENT 2 | ... PREVIEW | PREVIEW OF CONTENT 1 (WITH DIGITAL WATERMARK) | PREVIEW OF CONTENT 2 (WITH DIGITAL WATERMARK) | ... CONTENT RECORDING DATE | 2000.6.17 | 1999.12.31 | ... WHO RECORDED THE CONTENT | TARO YAMASHITA | HANAKO UENO | ... TITLE | BATTLE IN PEBBLE BEACH | COUNTDOWN 2000 | ... GENRE | SPORTS | EVENT | ... CONTENT TYPE | FINAL (GOLF TOURNAMENT) | NEW YEAR'S EVE | ... DUPLICATION FEE | $10 | $5 | ... ... | ... | ... | ... CONTACT ADDRESS FOR THE BUYER | abc@def | ghi@jkl | ... WARNING | UNAUTHORIZED ACT OF COPYING IS SUBJECT TO PENALTY CATALOG Ex. 1004 (Senoh), FIG. 4. Senoh's ***product catalog*** includes references to items of content because it allows the user to view previews of the content. Ex. 1004 (Senoh), ¶¶[0043]-[0044].

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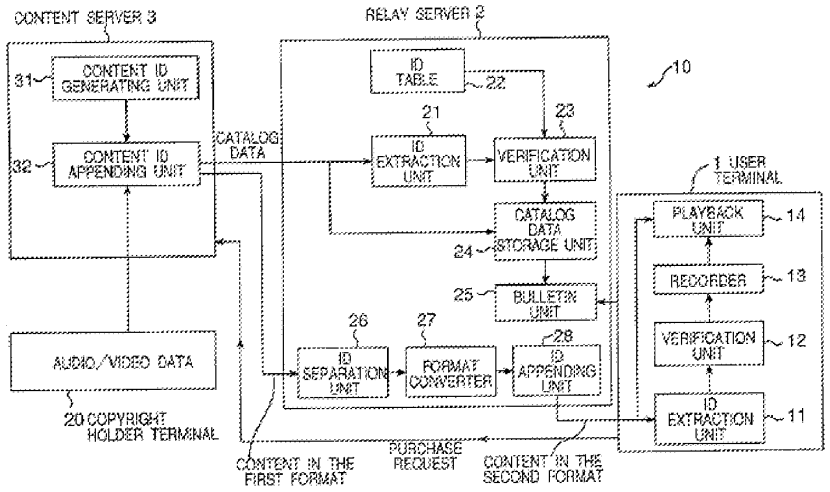
	Claim	Prior Art Disclosures
		Senoh does not explicitly teach that the product catalog ***includes, in association with each item of digital content, a reference to each implementation of said item of digital content***. But, this feature would have been obvious over the combined teachings of Senoh and Kenner. As explained in connection with *Limitation [2Aii]*, above, it would have been obvious to store multiple implementations (formats) of Senoh's preview content at Senoh's relay server based on the teachings of Kenner. In doing so, a POSITA would have further found it obvious to include ***a reference to each implementation of said item of digital content*** through use of a directory structure on the relay server. Ex. 1002 (Reddy Decl.), ¶¶125-127, 144, 172-173. As taught by Kenner if an acceptable codec is installed on the end-user's terminal, "a URL is created from the storage location of the video clip (step 128)." Ex. 1006 (Kenner), 18:48-50. "For example, such a created URL might be "http://deliverysite.com/clips/watchme." *Id.*, 18:48-51. But, this URL is missing the "format type extension," such as ".mpg" or ".avi." *Id.*, 18:50-56. In implementing Senoh's product catalog, including, for example, previews of video content using Kenner's techniques, each preview would be stored in a particular directory associated with that preview (e.g., /clips/watchme in the context of Kenner's example). Ex. 1002 (Reddy Decl.), ¶¶125-127, 144, 172-173. The directory structure including /clips/watchme" is a reference to each implementation of the digital content called "watchme." Ex. 1002 (Reddy Decl.), ¶¶125-127, 144, 172-173. In other words, /clips/watchme is the directory in which each implementation of watchme is stored including watchme.mpg and watchme.avi. *Id.* A POSITA would have thus found obvious an implementation of Senoh's product catalog based on Kenner's techniques to have been obvious as illustrated below:

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	Claim	Prior Art Disclosures
		 For the reasons explained above, it would have been obvious to use Kenner's techniques for serving multimedia content that can be viewed by a user's terminal. *See Limitation [2Aii].* And this would have included using the technique for storing different formats and accessing those formats from, for example, a browser on the user's terminal by addressing the content using Kenner's techniques. Ex. 1002 (Reddy Decl.), ¶¶125-127, 144, 172-173.
[9P]	A system comprising:	The preamble is not a limitation of the claim. However, even if the preamble is interpreted as being a limitation of the claim, Senoh discloses a system, such as the content distribution system shown in FIG. 2. *See, e.g.*, Ex. 1004 (Senoh), ¶¶[0002] ("This invention relates to controlling an electronic distribution system for distributing digital multimedia content, including audio and video, by way of a network."), [0010] ("An object of this invention is therefore to provide an electronic distribution system . . . ."), [0030] ("The configuration of this content distribution system is described in greater detail below with reference to FIG. 2.").

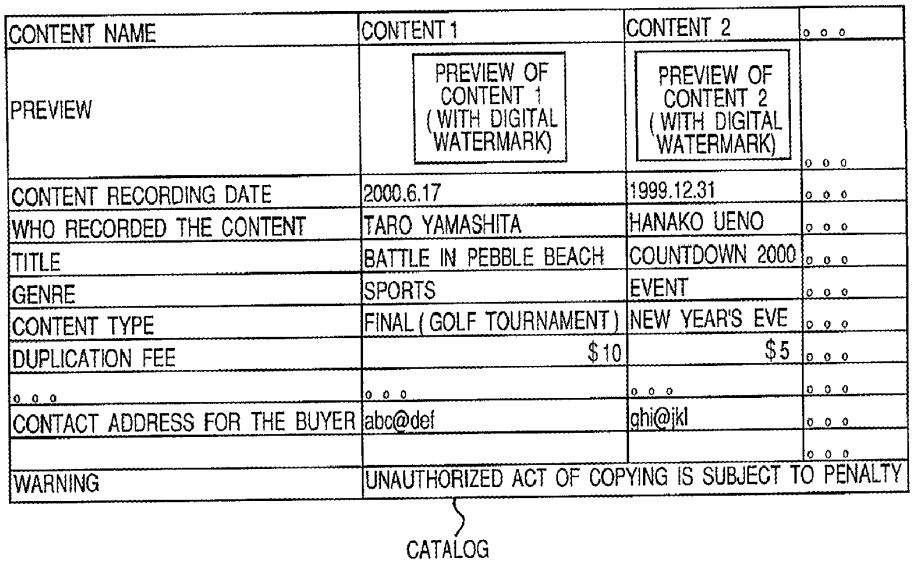
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	Claim	Prior Art Disclosures
		Fig.2  Ex. 1004 (Senoh), FIG. 2; *see also* Ex. 1002 (Reddy Decl.), ¶¶167, 174-175.
[9A]	a processor; and	A POSITA would have understood that Senoh teaches ***a processor*** even though it is not explicitly mentioned. At the very least, the use of ***a processor*** in Senoh's system would have been obvious. For instance, Senoh teaches a "content distribution system 10" that includes a "user terminal 1," "relay server 2," and "content server 3." Ex. 1004 (Senoh), ¶[0029]. These entities are capable of communicating over a "communication network 4, such as the Internet . . . ." *Id.* Moreover, Senoh explains that various content may be converted from one format (e.g., MPEG-2) to another format (MPEG-4). *Id.*, ¶¶[0064], [0067]. Furthermore, Senoh explains that > The processing operations of the various components of the above described content distribution system can also be written as a computer program causing a computer to execute the various

	Claim	Prior Art Disclosures
		processes. Such a computer can be recorded to a CD, DVD, or other optical disc, to a floppy disk or other magnetic storage medium, or to flash memory or other semiconductor storage medium. The computer program could yet further be distributed as an electric signal via the Internet or other network. Ex. 1004 (Senoh), ¶[0081]. The POSITA would have understood all of these references to refer to systems with processors for executing computer-readable instructions. Ex. 1002 (Reddy Decl.), ¶176. Even if it could be argued that a processor is not disclosed to the POSITA, a POSITA would have understood how to implement the functionality described by Senoh and rendered obvious by Senoh in view of Kenner in a processor because processors were commonly used to execute computer-readable instructions in computer systems such as those described by Senoh. Ex. 1002 (Reddy Decl.), ¶176.
[9B]	a storage facility accessible to the processor and containing code which, when executed by the processor, causes the processing system to	Senoh discloses or at least renders obvious the claimed ***storage facility accessible to the processor and containing code which, when executed by the processor, causes the processing system to*** perform various functions. For instance, Senoh explains: The processing operations of the various components of the above described content distribution system can also be written as a computer program causing a computer to execute the various processes. Such a computer can be recorded to a CD, DVD, or other optical disc, to a floppy disk or other magnetic storage medium, or to flash memory or other semiconductor storage medium. The computer program could yet further be distributed as an electric signal via the Internet or other network. Ex. 1004 (Senoh), ¶[0081]. The POSITA would have understood that the functionality performed by, for instance the content server and the relay server would have been implemented based on computer code,

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	Claim	Prior Art Disclosures
		and that such code would have been stored in a ***storage facility*** so that the computer-readable instructions could be fetched and executed by the processor to perform the functionality disclosed and rendered obvious by Senoh. Ex. 1002 (Reddy Decl.), ¶177-179.
[9Bi]	receive and store a plurality of items of digital content to be made available for use in wireless communication devices used by a plurality of wireless telecommunications subscribers,	Senoh discloses or at least renders obvious code that when executed causes the processing system to ***receive and store a plurality of items of digital content to be made available for use in wireless communication devices used by a plurality of wireless communication subscribers***. Senoh discloses that the processing system performs functionality associated with ***receiving and storing*** using Senoh's relay server 2. Ex. 1002 (Reddy Decl.), ¶¶76-77, 147, 180. Senoh discloses a catalog with multiple items of content as shown in Figure 4 (below). *Fig.4*  CONTENT NAME / CONTENT 1 / CONTENT 2 / ... PREVIEW / PREVIEW OF CONTENT 1 (WITH DIGITAL WATERMARK) / PREVIEW OF CONTENT 2 (WITH DIGITAL WATERMARK) CONTENT RECORDING DATE / 2000.6.17 / 1999.12.31 WHO RECORDED THE CONTENT / TARO YAMASHITA / HANAKO UENO TITLE / BATTLE IN PEBBLE BEACH / COUNTDOWN 2000 GENRE / SPORTS / EVENT CONTENT TYPE / FINAL (GOLF TOURNAMENT) / NEW YEAR'S EVE DUPLICATION FEE / $10 / $5 CONTACT ADDRESS FOR THE BUYER / abc@def / ghi@jkl WARNING / UNAUTHORIZED ACT OF COPYING IS SUBJECT TO PENALTY CATALOG

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	Claim	Prior Art Disclosures
		Ex. 1004 (Senoh), FIG. 4. This figure shows "[a] sample catalog compiling plural catalog entries," from which users can "select desired content by accessing [a] bulletin board on the relay server 2 and viewing the catalog." *Id.*, ¶[0045]. The catalog data is generated by and sent from the content server 3 to the relay server 2. *See* Ex. 1004 (Senoh), ¶¶[0043] ("The content server 3 then generates and sends catalog data for the content to the relay server 2 in order to market the content to a wider audience."), [0044] ("[T]he relay server 2 is a server computer accessible from the network and storing a compiled catalog of plural catalog data entries."). This allows the relay server to store "a compiled catalog of plural catalog data entries." *Id.*, ¶[0044]. Content stored at relay server includes previews of audio or video data. "If the content contains video, the relay server 2 preferably enables the content highlights to be previewed. If the content is audio (music), a selection of a particular length could be provided as a preview." Ex. 1004 (Senoh), ¶[0044]; *see also id.*, FIG. 4. Senoh's different previews associated with the different catalog entries (e.g., as shown in FIG. 4) are ***received and stored in*** relay server and are ***items of digital content to be made available for use in wireless communication devices used by a plurality of wireless services subscribers*** . Ex. 1002 (Reddy Decl.), ¶¶78 (citing Ex. 1011, 2:5-7 and explaining that wireless services for cellular phones were provided as a subscription service using, for example, Subscriber Identity Modules in cellular phones), 180.
[9Bii]	including receiving and storing a plurality of different implementations of at least one of the items of digital content, where each implementation of any given item of digital content corresponds to a different set of device capabilities;	Senoh in view of Kenner renders obvious code that when executed causes the processing system to ***receive and store a plurality of different implementations of at least one of the items of digital content, where each implementation of any given item of digital content corresponds to a different set of device capabilities***. While Senoh describes how items of content (e.g., video and audio previews) are received at the relay server, Senoh does not disclose a mechanism for ensuring that various user terminals can view the previews from the catalog if the capabilities of those terminals differ. In connection with the catalog previews, Senoh thus does not disclose ***receiving and storing a plurality of different implementations of at least one of the items of digital content, where each implementation of any given item of content corresponds to a different set of device capabilities.*** A POSITA would have looked for a technique to ensure that the user terminals

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	Claim	Prior Art Disclosures
		had the proper CODEC installed to allow the terminal to view or listen to the preview and would have found a solution in Kenner. Ex. 1002 (Reddy Decl.), ¶¶133-138, 181, 186. Kenner teaches a technique to ensure that the end-user terminal making the request for previews from the catalog receives the preview in a format that the terminal can decode and display. Specifically, Kenner teaches "[a] system and method for the selection and retrieval of various types of video data from distributed delivery sites . . . ." Ex. 1006 (Kenner), Abstract. Kenner's "Smart Mirror" sites "maintains copies of . . . data in several alternative file formats," and "[t]he appropriate file format is automatically selected based on the capabilities of a user terminal making a request for data." *Id.* Kenner explains that ensuring that a codec for decoding multimedia is the appropriate codec to allow viewing of the media "can be difficult, time-consuming, or inconvenient." Ex. 1006 (Kenner), 2:26-29. "If a user is forced to download a CODEC program before he can play a video file, he may be discouraged from pursuing that particular video request any further." *Id.*, 2:29-32. Kenner further explains that > Since video delivery over the Internet has quickly gained in popularity, a need exists for a system that can make sure that a user's video request can, in most cases, be satisfied by video clip stored in a compression format recognized by a CODEC on the user's terminal, thereby eliminating or reducing the user's need to download a new CODEC program. Ex. 1006 (Kenner), 5:48-54. Kenner thus uses a "format selection scheme . . . to automatically select a video clip file compressed in a format recognized by a CODEC program already installed and operative on a user terminal." *Id.*, 6:1-4. > A Web page hosting an embedded video clip also includes code to activate the Smart Mirroring and format selection schemes. Accordingly, a video clip selection and retrieval system according to the invention stores each video clip at various locations in a number of different compression formats. A format selection

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	Claim	Prior Art Disclosures
		module comprises software programs that instruct the user terminal to determine which CODEC programs are installed at a user terminal, select a preferred CODEC for use, locate video clips stored in a compression format recognized by the preferred CODEC, and redirect or modify a video request so the video delivery system can locate and retrieve the desired clip. Where no appropriate CODEC is detected, the format selection module prompts the user to download and install a preferred CODEC. In a first embodiment of the format selection module, a video clip is stored in a number of different compression formats at individual delivery sites connected to the Internet. The video clip and its address are referenced on a Web page providing access to the server. The Web page also contains an embedded software program for querying the user terminal to determine what CODECs are installed at the terminal. The embedded program is automatically executed when the user requests a video clip which is referenced on the Web page. If the query detects the presence of a CODEC that can decompress a video clip stored by one of the servers, the embedded program will select that CODEC and request the appropriate video clip. Ex. 1006 (Kenner), 7:14-40. The invention is capable of selecting a preferred file format from a plurality of available formats. Accordingly, the storage module 27 of the first delivery site 26 (FIG. 1) includes storage for a plurality of video clips in different formats. Four clips 116-119 are shown, although any number can be used under the system and method of the invention.

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	Claim	Prior Art Disclosures
		Ex. 1006 (Kenner), 18:6-13. Based on the foregoing, Kenner describes method including ***receiving and storing a plurality of different implementations of at least one of the items of digital content*** by explaining that "a video clip selection and retrieval system according to the invention stores each video clip at various locations in a number of different compression formats." *Id.*, 7:16-19, 7:28-30. As Kenner explains, different formats correspond to different ***device capabilities***: "The appropriate file format is automatically selected based on the capabilities of a user terminal making a request for data." Ex. 1006 (Kenner), Abstract. And, even if Kenner did not explicitly disclose receiving the different implementations, it would have been obvious to receive them from the source of the content after transcoding of the data into different formats to give the content creator maximum control over the look of the content on various devices in various formats, as explained in more detail below. Ex. 1002 (Reddy Decl.), ¶¶142, 181, 186. A POSITA would have found it obvious to use Kenner's system for retrieving content of a particular format keyed to the device capabilities of the requesting device in connection with Senoh's catalog including video. As explained above, Senoh teaches an online catalog for browsing multimedia content. Ex. 1004 (Senoh), ¶¶[0043]-[0044]. The catalog can include previews of the audio or video. *Id.*, ¶[0044]. Yet, Senoh does not explain how the multimedia previews would have been viewed on the user terminal. Nor does Senoh provide a discussion of how to ensure that the end-user's terminal can play the audio or video preview from the catalog. The POSITA would have looked to Kenner for several reasons. First, the POSITA would have understood that different devices having different capabilities for viewing multimedia content like Senoh's previews needed to have the data delivered in certain formats to display well on the devices. Ex. 1002 (Reddy Decl.), ¶¶39-44, 130, 181, 186; Ex. 1004 (Senoh), ¶[0008] ("A problem arises . . . when the specifications of the distributed content differ from the specifications of content that is viewable on the user's terminal or monitor, resulting in the user being unable to enjoy the content."). A POSITA would have been motivated to perform a step of receiving preview data in different implementations corresponding to different devices that access Senoh's catalog, and storing that data with other catalog data at the relay server, so that a wide variety of devices can

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	Claim	Prior Art Disclosures
		preview the content from the catalog, thus further disseminating the content to a variety of users, as desired by Senoh. Ex. 1004 (Senoh), ¶[0043]; Ex. 1002 (Reddy Decl.), ¶¶132, 186. Second, a POSITA knew that latency in viewing content on the Web affected the user experience. Ex. 1002 (Reddy Decl.), ¶¶137, 186. Thus, using the same transcoding processes that Senoh uses for purchased full-length content would have been unattractive for Senoh's previews. Ex. 1002 (Reddy Decl.), ¶¶137, 186. A POSITA would have understood from Senoh that content in the catalog originated from different content creators/copyright holders. Ex. 1002 (Reddy Decl.), ¶¶137, 186. Specifically, Senoh explains that the copyright holder and content server computers could be the same machines, Ex. 1004 (Senoh), ¶[0032], that each copyright holder receives a unique ID, *id.*, ¶[0034], and that the relay server stores a catalog with content from multiple copyright holders, *id.*, ¶[0054], FIG. 5; Ex. 1002 (Reddy Decl.), ¶¶137, 186. Therefore, to implement a system where the content server maintains the previews until requested would have caused the content to be fetched when the catalog data was requested, sent to the relay server, transcoded at the relay server, and sent to the user terminal, from each of the content servers that provided catalog content. This would have added latency to the system, resulting in a potentially frustrating user experience that could lead to the perception that the service was poor quality. Ex. 1002 (Reddy Decl.), ¶¶138, 186. Therefore, transcoding the preview content in advance like Agraharam does would have been seen as a way to reduce latency for resource intensive audio and video content like Senoh's previews. *Id.* And, while users might be willing to wait for content to be transcoded after they pay for it and await its delivery, users may be less tolerant of delays while viewing a number of different previews in the catalog while browsing for something they may want to buy. *Id.* Thus, the POSITA would have been led to look to Kenner for a solution to the problem of ensuring content was delivered to devices in a format they could properly view. *Id.* Third, storing multiple implementations of an item of content (previews) is one of a finite number of predictable solutions available to the POSITA for enabling content to be tailored to the user terminals requesting Senoh's previews. Ex. 1002 (Reddy Decl.), ¶¶139, 186. Indeed, besides receiving and storing different implementations of items of content, one implementation could be received and transcoded at the relay server; implementations may

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	Claim	Prior Art Disclosures
		be transcoded on the fly from a single implementation, or, contrary to Senoh's teachings, the catalog content could be kept at content servers and either transcoded there statically or dynamically. *Id.*. These solutions all had predictable results as the concepts of "static" transcoding and "dynamic" transcoding were discussed in the literature and had known implications. *See, e.g.*, Ex. 1008, pp.154-157. The POSITA would have seen that Kenner provides a mechanism for storing multimedia content at a server which hosts a webpage in which the content is embedded and which ensures that the end-user's terminal can play the content back. Ex. 1002 (Reddy), ¶143, 186. Kenner explains that servers can store "a plurality of video clips in different formats." Ex. 1006 (Kenner), 18:8-11. In the context of Senoh's catalog, the POSITA would have understood that the first step in viewing the catalog included loading a web page such that a browser or other software on the user terminal could view the catalog data. As illustrated in Senoh's FIG. 4, the webpage would include one or more links to audio or video content in the form of previews of the items of content. *See* Ex. 1004 (Senoh), FIG. 4. Loading a webpage with embedded video data is also described by Kenner. *See* Ex. 1006 (Kenner), 18:32-33 ("First, the Web page containing the video clip is loaded by the user terminal (step 120)."). To ensure that the user terminal's browser can view the video, a POSITA would have found it obvious to employ Kenner's embedded script, which "specifies a sequence of preferred CODECs and corresponding video clip format types." Ex. 1006 (Kenner), 18:33-39. Based on the execution of this script, "a URL is created from the storage location of the video clip" on the server. *Id.*, 18:48-50. Then, the appropriate file format extension is appended to it to allow the identification of a format of the file that can be played back on the user terminal. *Id.*, 18:51-61 ("Note that the created URL does not have a format type extension. The created URL is then modified (step 130) by appending a format type extension (e.g. ".mpg" for MPEG-formatted clips, or ".avi" for Microsoft Video for Windows-formatted clips) to the location of the video clip. The format type extension used depends on the selected CODEC. The resulting URL (e.g. "http://www.deliverysite.com/clips/watchme.mpg") uniquely specifies a video clip file in a format recognized by the preferred CODEC installed on the user terminal.").

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	Claim	Prior Art Disclosures
		A POSITA would have been motivated to use techniques disclosed by Kenner in connection with the catalog of Senoh because it would have allowed the preview content to be played by various user terminals having different capabilities through the automatic selection of content that can be played by the terminal. Ex. 1002 (Reddy Decl.), ¶¶140, 186. This would have minimized user frustration in either not being able to view certain content or having to locate and install a particular codec to play the one version of content stored at the server location. Ex. 1002 (Reddy Decl.), ¶¶139, 186. The use of Kenner's known technique to allow the system to automatically correlate pre-stored video having particular formats with user terminals capable of playing that content would have merely applied a known technique to Senoh's catalog and would have yielded only predictable results of allowing a diverse set of devices with different codes to view the previews of the content items through the catalog site. Ex. 1002, ¶140, 186. The POSITA would have looked to Kenner to provide a technique that allowed the system to correlate between installed CODECs on client terminals and available implementations of the items of content. Ex. 1002 (Kenner), ¶141, 186. Because the interrelated techniques were taught in detail in the prior art, and the art was predictable and well-understood, the POSITA would have had a reasonable expectation of success in combining Senoh's relay server and catalog with Kenner's technique for ensuring that user terminals could view video files. Ex. 1002 (Reddy Decl.), ¶143, 186. Moreover, even if it was contended that Kenner did not teach receiving and storing the different implementations of the items of content, it would have been obvious to have the content creators produce the items of content and send them to the relay server such that are received and stored in the compiled catalog disclosed by Senoh. Ex. 1002 (Reddy Decl.), ¶¶142, 186; Ex. 1008, p.156. This is because content creators would have wanted to have control over the transcoding of their content, and storing that content with the remainder of the catalog data would have improved the speed at which it could be delivered to the end-user. *Id.* This would have improved the marketability of the system and content. *Id.*
[9Biii]	maintain a product catalog containing a description of the items of digital content, wherein the product catalog includes, in association with	Senoh discloses and renders obvious code that when executed causes a processor to ***maintain a product catalog containing a description of items of digital content***. Senoh in view of Kenner renders obvious code that when executes causes a processor to maintain a product catalog ***wherein the product catalog includes, in association with each item of digital content, a reference to each implementation of said item of digital content***.

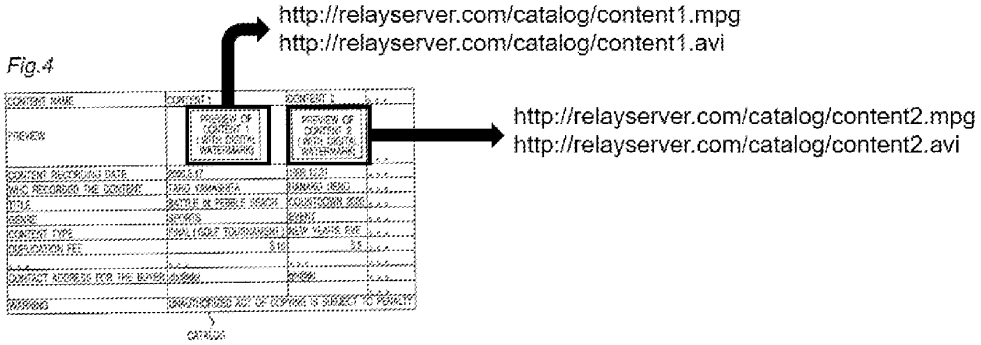
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	Claim	Prior Art Disclosures
	each item of digital content, a reference to each implementation of said item of digital content;	Senoh explains that "content server 3 . . generates and sends catalog data for content to the relay server 2 in order to market the content to a wider audience." Ex. 1004 (Senoh), ¶[0043]. "[T]he relay server 2 is a server computer accessible from the network and storing a compiled catalog of plural catalog data entries." *Id.*, ¶[0044]. "A sample catalog compiling plural catalog data entries is shown in FIG. 4." *Id.*, ¶[0045]. *Fig.4* CONTENT NAME | CONTENT 1 | CONTENT 2 | . . . PREVIEW | PREVIEW OF CONTENT 1 (WITH DIGITAL WATERMARK) | PREVIEW OF CONTENT 2 (WITH DIGITAL WATERMARK) | . . . CONTENT RECORDING DATE | 2000.6.17 | 1999.12.31 | . . . WHO RECORDED THE CONTENT | TARO YAMASHITA | HANAKO UENO | . . . TITLE | BATTLE IN PEBBLE BEACH | COUNTDOWN 2000 | . . . GENRE | SPORTS | EVENT | . . . CONTENT TYPE | FINAL (GOLF TOURNAMENT) | NEW YEAR'S EVE | . . . DUPLICATION FEE | $10 | $5 | . . . . . . | . . . | . . . | . . . CONTACT ADDRESS FOR THE BUYER | abc@def | ghi@jkl | . . . | | | . . . WARNING | UNAUTHORIZED ACT OF COPYING IS SUBJECT TO PENALTY CATALOG Ex. 1004 (Senoh), FIG. 4. Senoh's ***product catalog*** includes references to items of content because it allows users to view previews of the content. Ex. 1004 (Senoh), ¶[0043]-[0044].

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	Claim	Prior Art Disclosures
		Senoh does not explicitly teach that the product catalog ***includes, in association with each item of digital content, a reference to each implementation of said item of digital content***. But, this feature would have been obvious over the combined teachings of Senoh and Kenner. As explained in connection with *Limitation [2Aii]*, above, it would have been obvious to store multiple implementations (formats) of Senoh's preview content at Senoh's relay server based on the teachings of Kenner. In doing so, a POSITA would have further found it obvious to include ***a reference to each implementation of said item of digital content*** through use of a directory structure on the relay server. Ex. 1002 (Reddy Decl.), ¶¶125-127, 144, 182, 186. As taught by Kenner if an acceptable codec is installed on the end-user's terminal, "a URL is created from the storage location of the video clip (step 128)." Ex. 1006 (Kenner), 18:48-50. "For example, such a created URL might be "http://deliverysite.com/clips/watchme." *Id.*, 18:48-51. But, this URL is missing the "format type extension," such as ".mpg" or ".avi." *Id.*, 18:50-56. In implementing Senoh's product catalog, including, for example, previews of video content using Kenner's techniques, each preview would be stored in a particular directory associated with that preview (e.g., /clips/watchme in the context of Kenner's example). Ex. 1002 (Reddy Decl.), ¶¶125-127, 144, 181, 186. The directory structure including /clips/watchme" is a reference to each implementation of the digital content called "watchme" because it unambiguously identifies all the files stored in that directory with the name "watchme." Ex. 1002 (Reddy Decl.), ¶¶125-127, 144, 181, 186. In other words, /clips/watchme is the directory in which each implementation of watchme is stored including watchme.mpg and watchme.avi. *Id.* A POSITA would have thus found obvious an implementation of Senoh's product catalog based on Kenner's techniques to have been obvious as illustrated below:

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	Claim	Prior Art Disclosures
		 For the reasons explained above, it would have been obvious to use Kenner's techniques for serving multimedia content that can be viewed by a user's terminal. *See Limitation [2Aii].* And this would have included using the technique for storing different formats and accessing those formats from, for example, a browser on the user's terminal by addressing the content using Kenner's techniques. Ex. 1002 (Reddy Decl.), ¶¶125-127, 144, 182, 186.
[9Biv]	receive a request from a wireless device used by one of the subscribers;	Senoh in view of Kenner renders obvious code that when executed causes a processor to ***receive a request from a wireless device used by one of the subscribers***. In the combined Senoh-Kenner technique for serving appropriately formatted multimedia data associated with Senoh's product catalog to end-user terminals, a POSITA would have understood that once the format type is determined, a URL including the "format type extension" is "transmitted to the delivery site specified by the URL, and the clip is downloaded (step 132) and played (step 134)." Ex. 1006 (Kenner), 18:61-63; Ex. 1002 (Reddy Decl.), ¶¶151, 183. The URL sent from the user terminal is received by Senoh's relay server in the combined Senoh-Kenner system, causing the preview having a file format that can be viewed by the user's terminal to be served to the end-user terminal in a format that can be viewed on that terminal. For the reasons explained above, a process including ***receiving a request from a wireless device used by one of the subscribers*** would have been obvious.

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	Claim	Prior Art Disclosures
[9Bv]	in response to the request, select a portion of the product catalog to be presented to the subscriber, based on device capabilities of the wireless device used by the subscriber; and	Senoh in view of Kenner renders obvious code that when executed causes a processor to ***in response to the request, selecting a portion of the product catalog to be presented to the subscriber, based on the capabilities of the wireless device used by the subscriber.*** As explained above in connection with *Limitation [2Aii]*, it would have been obvious to use the Kenner techniques in combination with Senoh's product catalog to ensure that properly formatted video and audio data are served from Senoh's relay server to user terminals viewing the product catalog previews. In the combined system, once a URL having the appropriate "format type extension" for a codec installed on the terminal is received, a portion of the product catalog is selected based on the device capabilities and is presented to the subscriber thus allowing the content to be downloaded and played. Ex. 1006 (Kenner), 18:61-65 ("This URL is then transmitted to the delivery site specified by the URL, and the clip is downloaded (step 132) and played (step 134). When the video clip file is received, the browser automatically invokes the proper CODEC for its display."); Ex. 1002 (Reddy Decl.), ¶¶154, 184. Thus, in response to the request—i.e., the URL including the correctly format type extension as taught by Kenner—a portion of the product catalog is selected from the relay server to be presented to the subscriber on their terminal. This selection is performed ***based on the device capabilities of the wireless device used by the subscriber*** because the format type extension is used to obtain the correctly formatted content from the server based on the codec installed at the terminal. Ex. 1006, 18:48-65; Ex. 1002 (Reddy Decl.), ¶154, 184. And, only ***a portion of the product catalog*** is selected because the preview content is only provided in one format. *Id.*
[9Bvi]	cause the selected portion of the product catalog to be presented to the subscriber via a wireless telecommunications network, such that the selected portion, as presented to the subscriber, provides	Senoh in view of Kenner renders obvious code that when executed, ***causes the selected portion of the product catalog to be presented to the subscriber via a wireless network, such that the selected portion, as presented to the subscriber, provides only a single description of each item of digital content in said portion, regardless of the number of implementations of each said item***. A subscriber using the cellular phone described by Senoh to view the product catalog including video previews, Ex. 1004, ¶¶[0044], [0060], [0074], in which the techniques of

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	Claim	Prior Art Disclosures
	only a single description of each item of digital content in said portion, regardless of the number of implementations of each said item.	Kenner are used to select a preview in the appropriate format for viewing on the user terminal would be presented with ***the selected portion of the product catalog via a wireless network***. Ex. 1002, ¶¶156, 185. Using the combined teachings of Senoh and Kenner, the ***selected portion, as presented to the subscriber, provides only a single description of each item of digital content in said portion, regardless of the number of implementations*** because, for example, the video preview would be presented on one format (e.g., .mpg) and not another available format (e.g., .avi) based on the available codec at the terminal. Ex. 1006 (Kenner), 18:48-67; Ex. 1002, ¶¶156, 185. In other words, even when Senoh's product catalog refers to a .mpg and a .avi formatted version of a particular preview, only one of the formats will be returned for viewing of the preview using Kenner's techniques. Ex. 1002 (Reddy Decl.), ¶¶156, 185.

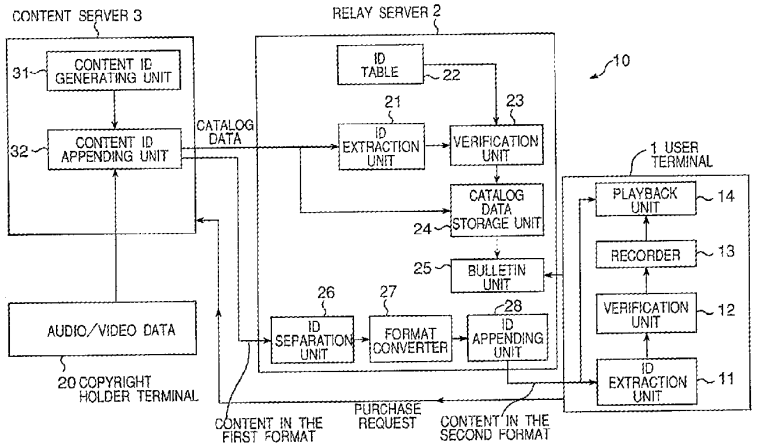
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APPENDIX C

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SNQ3: U.S. Patent Application Publication No. 2002/0078178 A1 to Senoh ("Senoh," Ex. 1004) in view of U.S. Patent No. 6,345,279 to Li et al. ("Li," Ex. 1007) renders claims 1-2, 4, 8-9, and 11 obvious.

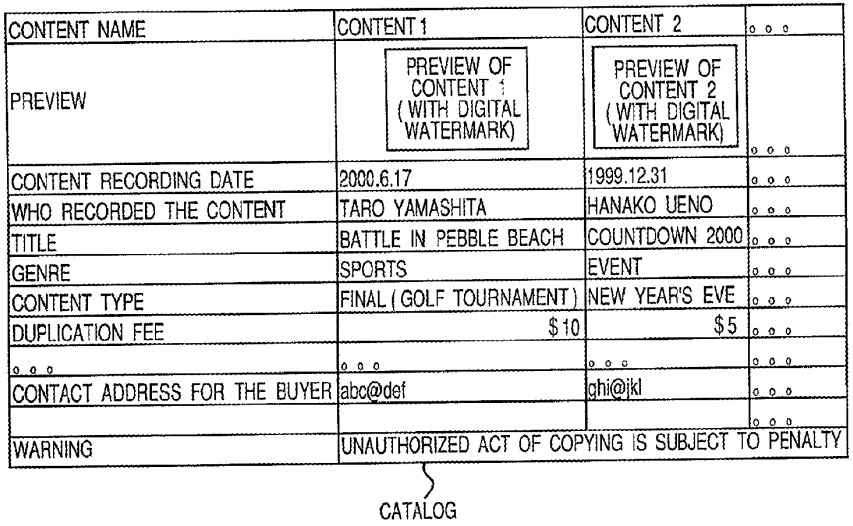
Senoh is prior art under pre-AIA 35 U.S.C. § 102(e) because it was filed in the United States on August 27, 2001 and published on June 20, 2002. Li is prior art under 35 U.S.C. § 102(a) and (e) because it was filed on April 2,3 1999 and issued on February 5, 2002.

	Claim	Prior Art Disclosures
[1P]	A method of providing access to content for use on wireless communication devices, the method comprising:	The preamble is not a limitation of the claim. However, even if the preamble is interpreted as being a limitation of the claim, Senoh discloses a method of providing access to content for use on wireless communication devices. Senoh discloses ***wireless communication devices*** because it discloses cellular user terminals that include cellular phones. Ex. 1002, ¶¶73, 188. Specifically, Senoh teaches a "user terminal 1" that accesses a relay server 2 which receives and stores catalog data related to various items of multimedia content. This is illustrated in Senoh Figure 2 (below). *Fig.2*  Ex. 1004 (Senoh), FIG. 2.

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	Claim	Prior Art Disclosures
		The "user terminal" can be a "cellular phone." Ex. 1004 (Senoh), ¶¶[0060], [0074] ("The user terminal 1 could be a personal computer, cellular phone, or television or video deck having a communication function."). As Senoh explains "[i]t will be obvious to one with ordinary skill in the related art that while only one user terminal 1 is shown in the figure, plurality user terminals can be connected." Ex. 1004 (Senoh), ¶[0029]; *see also* Ex. 1002 (Reddy Decl.), ¶74, 188; Ex. 1006 (Kenner), 8:26-28 ("Only three user terminals are shown; however, it should be recognized that the number of concurrent users of the invention is unlimited, such to the operational details set forth below.")). Senoh further describes a ***method of providing access to content for use on the wireless communication devices.*** Ex. 1002 (Reddy Decl.), ¶¶73-75, 188. In addition to allowing users to contact content providers to purchase content, *see, e.g.*, Ex. 1004 (Senoh), ¶¶[0045], [0057]-[0059], Senoh discloses a method of ***providing access to content*** in the form of previews of content through an online catalog. For example, Senoh explains that the "content server 3 . . . generates and sends catalog data for the content to the relay server 2 in order to market the content to a wider audience." Ex. 1004 (Senoh), ¶[0043]. When the content is video content, "the relay server 2 preferably enables the content highlights to be previewed." *Id.*, ¶[0044]. Users can "select desired content by accessing the bulletin board on the relay server 2 and viewing the catalog." *Id.*, ¶[0045]. This content is accessible to the user for use on wireless communication devices through the "common bulletin board" which includes a product catalog. Ex. 1004 (Senoh), ¶[0045].
[1Ai]	receiving and storing a plurality of items of content to be made available for use in wireless communication devices used by a plurality of wireless services subscribers,	Senoh discloses and renders obvious ***receiving and storing a plurality of items of content to be made available for use in wireless communication devices used by a plurality of wireless services subscribers***. Senoh teaches ***receiving and storing a plurality of items of content*** in the relay server in because Senoh's relay server receives previews of the content made available from copyright holders using Senoh's system. An example of content stored in the relay server (2) disclosed in Senoh is provided in Figure 4 (below).

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	Claim	Prior Art Disclosures
		Fig.4  CONTENT NAME | CONTENT 1 | CONTENT 2 | ... PREVIEW | PREVIEW OF CONTENT 1 (WITH DIGITAL WATERMARK) | PREVIEW OF CONTENT 2 (WITH DIGITAL WATERMARK) CONTENT RECORDING DATE | 2000.6.17 | 1999.12.31 WHO RECORDED THE CONTENT | TARO YAMASHITA | HANAKO UENO TITLE | BATTLE IN PEBBLE BEACH | COUNTDOWN 2000 GENRE | SPORTS | EVENT CONTENT TYPE | FINAL (GOLF TOURNAMENT) | NEW YEAR'S EVE DUPLICATION FEE | $10 | $5 CONTACT ADDRESS FOR THE BUYER | abc@def | ghi@jkl WARNING | UNAUTHORIZED ACT OF COPYING IS SUBJECT TO PENALTY CATALOG Ex. 1004 (Senoh), FIG. 4 (showing previews displayed in product catalog). This figure shows "[a] sample catalog compiling plural catalog entries," from which users can "select desired content by accessing [a] bulletin board on the relay server 2 and viewing the catalog." *Id.*, ¶[0045]. Thus, the relay server stores "a compiled catalog of plural catalog data entries." *Id.*, ¶[0044]. Content stored at relay server includes previews of audio or video data: "If the content contains video, the relay server 2 preferably enables the content highlights to be previewed. If the content is audio (music), a selection of a particular length could be provided as a preview." Ex. 1004 (Senoh), ¶[0044]; *see also id.*, FIG. 4. Here, a first item of content is "Preview of Content 1" and a second item of content is "Preview of Content 2," and thus are ***a plurality of items of content*** which are to be made available to user terminals including ***wireless communication devices used by a plurality of wireless services subscribers***. Ex. 1002 (Reddy Decl.), ¶¶76-77, 189.

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	Claim	Prior Art Disclosures
		These ***plurality of items of content*** are provided from Senoh's content server 3 and are ***received*** by, and ***stored*** in, the relay server. *See* Ex. 1004 (Senoh), ¶[0043] ("The content server 3 then generates and sends catalog data for the content to the relay server 2 in order to market the content to a wider audience. The catalog data could contain previews of content highlights . . . ."), ¶[0044] ("[T]he relay server 2 is a server computer accessible from the network and storing a compiled product catalog of plural catalog data entries."). These different previews associated with the difference catalog entries (e.g., as shown in FIG. 4) are ***received and stored in*** relay server and constitute ***items of digital content to be made available for use in wireless communication devices used by a plurality of wireless services subscribers***. Ex. 1002 (Reddy Decl.), ¶¶78 (citing Ex. 1011, 2:5-7 and explaining that wireless services for cellular phones were provided as a subscription service using, for example, Subscriber Identity Modules in cellular phones), 189.
[1Aii]	including receiving a plurality of different implementations of at least one of the items of content, where each implementation of any given item of content correspondents to a different set of device capabilities; and	This limitation would have been obvious over Senoh in view of Li. While Senoh describes how items of content (e.g., video and audio previews) are received and stored at the relay server, Senoh does not disclose a mechanism for ensuring that the content displays or is otherwise reproduced in a manner that is appropriate for the specific user terminal capabilities based on the terminal that is requesting to view the content. Ex. 1002 (Reddy Decl.), ¶¶79, 190. ISenoh thus does not disclose ***receiving and storing a plurality of different implementations of at least one of the items of digital content, where each implementation of any given item of content corresponds to a different set of device capabilities*** to allow wider access to Senoh's catalog previews. A POSITA would have thus looked to a technique to ensure that the user terminals received previews in a format that could be viewed by the terminal. Ex. 1002 (Reddy Decl.), ¶191. The POSITA would have recognized that Senoh's technique of sending the full-length content to the relay sever, transcoding it and sending it to the user terminal would not have been efficient for use with Senoh's video previews, which are stored as part of the catalog on the relay server and thus would have looked to a solution in which transcoded versions of the content were stored at the server that receives the request for the content. *Id.*, ¶¶191, 208. Li provides a technique that can accomplish this result and present content in the manner best suited for a particular user terminal. Li teaches a method and apparatus for adapting multimedia content for diverse client devices including personal digital assistants (PDAs)

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	Claim	Prior Art Disclosures
		and "smart cellular phones." Ex. 1007 (Li), 1:18-21, 1:31-36. The multimedia content is adapted "to optimally match the capabilities of the client device requesting it." *Id.*, 2:19-21. Each content item is "transcoded into multiple resolution and modality versions so that they can be rendered on different devices." *Id.*, 2:24-26. "For example, a video item is transcoded into a selected set of images so that it can be rendered on a device not capable of displaying video." *Id.* Li's invention "permits the transcoded versions of the content items to be generated prior to any requests. Thus, the invention can handle media items such as video and audio which are difficult to handle in conventional proxies. This off-line transcoding also leads to lower response latencies than proxies." Ex. 1007 (Li), 3:4-10. The content adaptation process "can be deployed on the server-side . . . ." *Id.*, 12:11-12. The specific item(s) of information to be served to the client device are determined based on the device capabilities. Ex. 1007 (Li), 6:3-9 ("A client device is characterized by its profile 310 which lists the capabilities 320 and resources 300 of the device. . . . A client may have a different number of capabilities 320 and resources 330."); *id.*, 6:42-47 ("A content adaptation process 350 uses the client profile 3109 to select from among the InfoPyramids 280 the versions 374 that best satisfy the particular client profile. These selected versions are rendered into a document 370 which is an adaptation (i.e., customization) of the original multimedia document 100."). A POSITA would have understood that while Senoh teaches a product catalog that includes information about multiple items of content including text and video clips that are provided from content creators, *see* Ex. 1004 (Senoh), ¶¶[0043]-[0045], FIG. 4; Ex. 1002 (Reddy Decl., ¶¶190-191, 204, Senoh does not describe techniques for ensuring that the catalog can be accessed by devices with different device capabilities to ensure that the content provided from the catalog can be viewed on the client devices. Ex. 1002 (Reddy Decl.), ¶¶190-191, 204. Therefore, the POSITA would have looked at prior art solutions to make the catalog as accessible to end-users as possible to achieve the goal of allowing the content to be marketed to "a wider audience" as taught by Senoh. Ex. 1004 (Senoh), ¶[0043]; Ex. 1002, ¶207. A POSITA would have found a solution in Li and would have been led to look at Li for such a solution for several reasons.

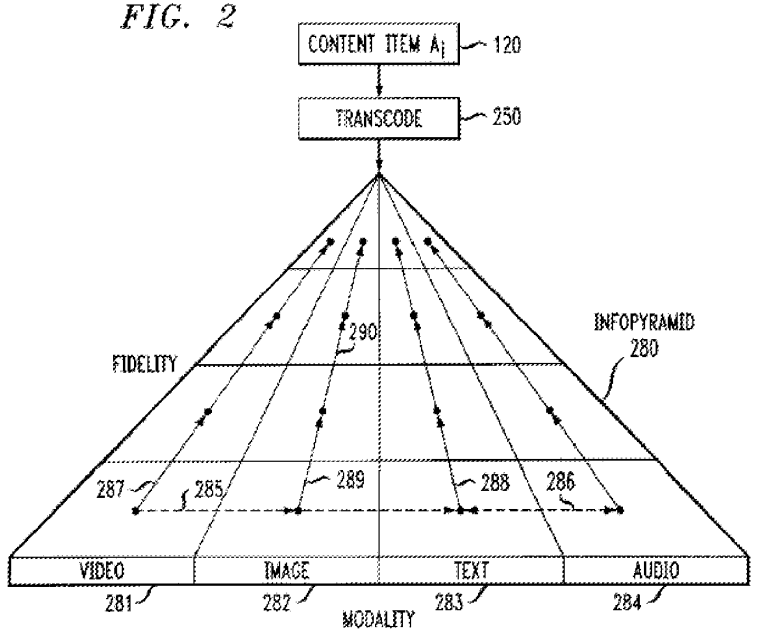
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	Claim	Prior Art Disclosures
		First, a POSITA knew that content creators wanted to have control over how the different versions of their content displayed on devices. Ex. 1002 (Reddy Decl.), ¶209; Ex. 1008 (Britton), p.156 ("The primary advantages of static transcoding are quality of presentation and performance.[] Each page is constructed by a human designer, generally working with tools that show how the application will look or sound and thus allowing the presentation to be hand-tailored for each environment."). To provide content creators the ability to control the appearance of different implementations of their content, the POSITA would have seen a benefit to having the content server maintain different, preformatted implementations of the previews, and provide those to Senoh's relay server to market the content to a wider audience. Ex. 1002 (Reddy Decl.), ¶209; Ex. 1004 (Senoh), ¶[0044] (catalog for marketing to wider audience). Second, a POSITA knew that latency in viewing content on the Web affected the user experience. Ex. 1002 (Reddy Decl.), ¶210. Thus, using the same transcoding processes that Senoh uses for purchased full-length content would have been unattractive for Senoh's previews. Ex. 1002 (Reddy Decl.), ¶210. A POSITA would have understood from Senoh that content in the catalog originated from different content creators/copyright holders. Ex. 1002 (Reddy Decl.), ¶210. Specifically, Senoh explains that the copyright holder and content server computers could be the same machines, Ex. 1004 (Senoh), ¶[0032], that each copyright holder receives a unique ID, *id.*, ¶[0034], and that the relay server stores a catalog with content from multiple copyright holders, *id.*, ¶[0054], FIG. 5; Ex. 1002 (Reddy Decl.), ¶210. Therefore, to implement a system where the content server maintains the previews until requested would have caused the content to be fetched when the catalog data was requested, sent to the relay server, transcoded at the relay server, and sent to the user terminal, from each of the content servers that provided catalog content. This would have added latency to the system, resulting in a potentially frustrating user experience that could lead to the perception that the service was poor quality. Ex. 1002 (Reddy Decl.), ¶210. Therefore, transcoding the preview content in advance like Agraharam does would have been seen as a way to reduce latency for resource intensive audio and video content like Senoh's previews. *Id.* And, while users might be willing to wait for content to be transcoded after they pay for it and await its delivery, users may be less tolerant of delays while viewing a number of different previews in the catalog while browsing for something they may want to buy. *Id.*

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	Claim	Prior Art Disclosures
		Thus, the POSITA would have been led to look to Kenner for a solution to the problem of ensuring content was delivered to devices in a format they could properly view. *Id.* Third, storing multiple implementations of an item of content (previews) is one of a finite number of predictable solutions available to the POSITA for enabling content to be tailored to the user terminals requesting Senoh's previews. Ex. 1002 (Reddy Decl.), ¶211. Indeed, besides receiving and storing different implementations of items of content, one implementation could be received and transcoded at the relay server; implementations may be transcoded on the fly from a single implementation, or, contrary to Senoh's teachings, the catalog content could be kept at content servers and either transcoded there statically or dynamically. *Id.* These solutions all had predictable results as the concepts of "static" transcoding and "dynamic" transcoding were discussed in the literature and had known implications. *See, e.g.*, Ex. 1008, pp.154-157. Specifically, the POSITA would have seen that Li teaches a way of transcoding content into numerous different formats to create what Li calls "InfoPyramids." Ex. 1007 (Li), 2:40-47, 5:66-6:2 ("As shown in FIG 2, the content items 120 of a multimedia document 100 are transcoded (250) into multiple modality and fidelity versions to generate a set of InfoPyramids 280."); Ex. 1002 (Reddy Decl.), ¶¶192-195.

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	Claim	Prior Art Disclosures
		FIG. 2  Ex. 1007 (Li), FIG. 2. Therefore, Li teaches transcoding content items into ***a plurality of different implementations of at least one of the items of content, where each implementation of any given item of content corresponds to a different set of device capabilities***. Ex. 1002 (Reddy Decl.), ¶195. As taught in Li, based on the client device capabilities and resources provided in a client device profile, an appropriate implementation of the item of content can be selected for the device, e.g., "all versions that are in video modality can be filtered out if the device is not capable of displaying video" and "all versions that are color images can be filtered out for a device that has only a black and white or gray-level screen." Ex. 1007 (Li), 6:52-56. The POSITA would have looked to Li to improve Senoh's catalog display techniques because Li provides a way to optimize the delivery of multimedia content to user devices. Ex. 1002 (Reddy Decl.), ¶¶197, 207.

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	Claim	Prior Art Disclosures
		It would have been obvious to transcode preview content in Senoh's content servers to create InfoPyramids using techniques taught in Li so that InfoPyramids could be provided to relay servers to enable selection of the best way to present content to a particular user terminal based on a device's capabilities and resources as taught in Li to address the known problem that different devices had different display capabilities and not all content was properly formatted for all devices. Ex. 1002 (Reddy), ¶¶205, 212. A POSITA would have found the inclusion of Li's known technique would have improved Senoh's catalog system in the same way that improved Li's system for allowing various devices to view content tailored to the device. *Id.*, ¶212. And, applying the Li techniques to content for Senoh's catalog would allow for consumers of video content to browse the catalog for content using a variety of devices thus accomplishing the intended goal of Senoh's product catalog—i.e., "to market the content to a wider audience." Ex. 1004 (Senoh), ¶[0043]. Moreover, applying Li's technique for adapting content to a variety of user terminals including "PDAs" and "smart cellular phones," Ex. 1007 (Li), 1:31-36, would have merely applied Li's known technique for transcoding various types of content such as Senoh's text and video and audio clips into different fidelity and/or modalities to allow as many users to view the content as possible from their mobile devices, *id.*, 4:58-67; Ex. 1002 (Reddy Decl.), ¶214. Applying Li to Senoh's catalog technique would have improved Senoh in the same way as it improved the prior art discussed in Li. Ex. (Reddy Decl.) 1002, ¶215. At the very least, applying Li's techniques on the data to be served to the relay server from Senoh's content servers for use in Senoh's catalogs would have improved upon Senoh in a predictable manner—by allowing catalog content to be tailored for many different types of devices so that the content could be marketed to wider audiences. Ex. 1002 (Reddy Decl.), ¶215. The POSITA would have reasonably expected to succeed in combining Senoh and Li because Li's transcoding techniques were known and predictable and combining them with Senoh would have merely combined the known transcoding techniques with known and Internet-based technologies to provide Senoh's product catalog to user devices. Ex. 1002 (Reddy Decl.), ¶216.
[1B]	maintaining a product catalog containing a description of the items of	Senoh teaches ***maintaining a product catalog containing a description of the items of content***. Senoh, however, does not explicitly teach that the product catalog includes ***in***

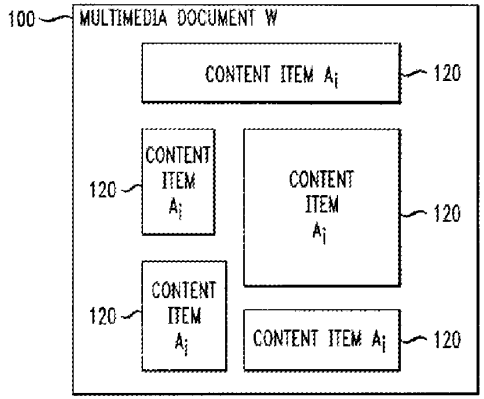
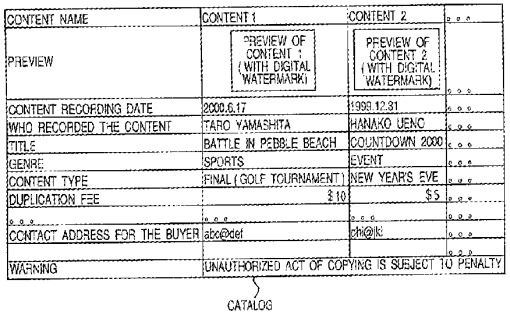
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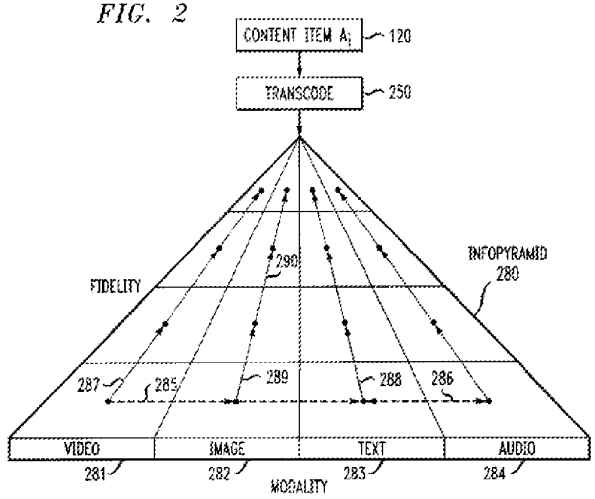
	Claim	Prior Art Disclosures
	content, the product catalog including, in association with each item of content, a reference to each implementation of said item of content.	***association with each item of content, a reference to each implementation of said item of content***. Senoh explains that "content server 3 . . generates and sends catalog data for content to the relay server 2 in order to market the content to a wider audience." Ex. 1004 (Senoh), ¶[0043]. "[T]he relay server 2 is a server computer accessible from the network and storing a compiled catalog of plural catalog data entries." *Id.*, ¶[0044]. "A sample catalog compiling plural catalog data entries is shown in FIG. 4." *Id.*, ¶[0045]. *Fig.4* CONTENT NAME | CONTENT 1 | CONTENT 2 | . . . PREVIEW | PREVIEW OF CONTENT 1 (WITH DIGITAL WATERMARK) | PREVIEW OF CONTENT 2 (WITH DIGITAL WATERMARK) | . . . CONTENT RECORDING DATE | 2000.6.17 | 1999.12.31 | . . . WHO RECORDED THE CONTENT | TARO YAMASHITA | HANAKO UENO | . . . TITLE | BATTLE IN PEBBLE BEACH | COUNTDOWN 2000 | . . . GENRE | SPORTS | EVENT | . . . CONTENT TYPE | FINAL (GOLF TOURNAMENT) | NEW YEAR'S EVE | . . . DUPLICATION FEE | $10 | $5 | . . . . . . | . . . | . . . | . . . CONTACT ADDRESS FOR THE BUYER | abc@def | ghi@jkl | . . . WARNING | UNAUTHORIZED ACT OF COPYING IS SUBJECT TO PENALTY | | . . . CATALOG Ex. 1004 (Senoh), FIG. 4.

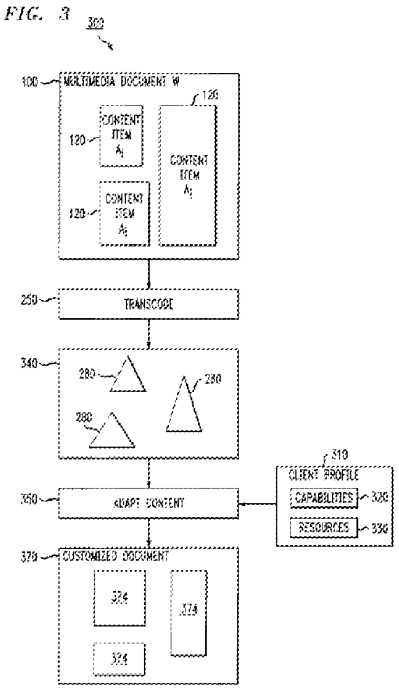
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	Claim	Prior Art Disclosures
		Senoh's ***product catalog*** includes references to items of content because it allows the user to view previews of the content. Ex. 1004 (Senoh), ¶¶[0043]-[0044]. Senoh does not explicitly teach that the product catalog ***includes, in association with each item of digital content, a reference to each implementation of said item of digital content***. But, this feature would have been obvious over the combined teachings of Senoh and Li. As explained in connection with *Limitation [1Aii]*, above, it would have been obvious to store multiple implementations (formats) of Senoh's catalog content at Senoh's relay server in data structures such as Li's InfoPyramids based on Li's teachings. In doing so, a POSITA would have understood that ***a reference to each implementation of said item of digital content*** was needed to identify the specific InfoPyramid for a specific item of information. More specifically, a POSITA would have understood that there needed to be a reference from the content items—e.g., Senoh's previews—and the InfoPyramid that defines various implementations of that content item stored at the relay server. Ex. 1002 (Reddy Decl.), ¶¶200-202. Such a reference is needed to tie the items (previews) in the catalog to the InfoPyramid including the implementations and without such a reference the system would not be able to correlate items to InfoPyramids. *Id.*, ¶202. As Li explains, a "multimedia document," includes "a number of content items Ai, denoted as reference numeral 120, where i=1, 2, . . . , n." Ex. 1007 (Li), 4:10-13. The POSITA would have observed that Li's multimedia documents would have provided a framework for representing Senoh's product catalog. Ex. 1002 (Reddy), ¶200. This can be seen in the illustration below:

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	Claim	Prior Art Disclosures
		 *Fig.4*  Ex. 1007 (Li), FIG. 1; Ex. 1004 (Senoh), FIG. 4. Here, different fields such as the preview of "Content 1" maybe one content item A_i and the preview of "Content 2" may be another item of content Ai in Li's FIG. 1. Ex. 1002 (Reddy Decl.), ¶202. Additionally, the text information for a particular item of content may represent another content item Ai and so on. Ex. 1002 (Reddy Decl.), ¶¶199, 202. According to Li's teachings, each item of content Ai is transcoded into a number of different representations and stored in the InfoPyramid data structure as illustrated below in FIG. 2:

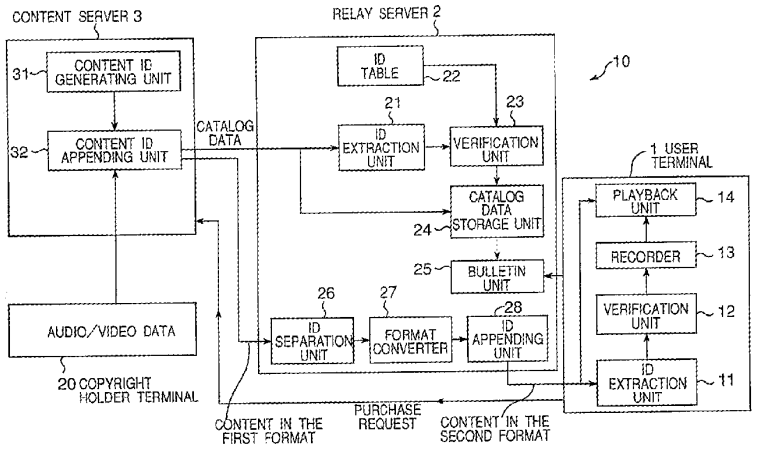
	Claim	Prior Art Disclosures
		FIG. 2  Ex. 1007 (Li), FIG. 2. When a document (e.g., Senoh's product catalog) includes multiple items of information with multiple components, each of the items can be represented in its own InfoPyramid (280), as indicated in Li's FIG. 3:

	Claim	Prior Art Disclosures
		FIG. 3  Ex. 1007 (Li), FIG. 3. Thus, a document such as Senoh's product catalog includes a number of content items (e.g., text, video previews) that each provide a ***product catalog*** which includes ***in association with each item of content*** (e.g., "Content 1's" preview) ***a reference to each implementation of said item of content***—i.e., a reference to the particular InfoPyramid in the combined Senoh-Li system that includes the "multiple representations of a multimedia item . . . organized into a pyramid-like data structure, as illustrated in FIG. 2." Ex. 1007 (Li), 4:58-61. These different implementations are further described by Li as follows: "The cells of the pyramid correspond to different representations of the objects using different modalities such as, for example, video 281, image 282, audio 283 and text 284, and fidelities such as in the range of full-

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	Claim	Prior Art Disclosures
		resolution (bottom of the pyramid) to low-resolution (top of the pyramid). A specific version of a multimedia item can be referred to by one of the cells." Ex. 1007 (Li), 4:61-67. The POSITA would have understood that in implementing Senoh's product catalog using Li's InfoPyramids, each item of information—e.g., preview of Content 1 or a preview of Content 2—would be associated with multiple implementations of that item as defined in the InfoPyramid and that the process of selecting which, if any, implementation is to be provided to the user terminal required use of a ***reference to*** the specific InfoPyramid—i.e., to ***each implementation of said item of content*** to allow selection of the appropriate item of content for the end user terminal. Ex. 1002 (Reddy Decl.), ¶¶202, 217. It would have been obvious to use Li's InfoPyramid techniques to provide items of content and implementations of items of content to Senoh's relay server for the product catalog for the reasons discussed above in connection with *Limitation [1Aii]* and in doing so, the POSITA would have been led to link information items (e.g., content items) with InfoPyramids as taught by Li to enable the system to operate properly. Ex. 1002 (Reddy Decl.), ¶217.
[2P]	A method of providing access to digital content for use on wireless communication devices, the method comprising:	The preamble is not a limitation of the claim. However, even if the preamble is interpreted as being a limitation of the claim, Senoh discloses a method of providing access to content for use on wireless communication devices. Senoh discloses ***wireless communication devices*** because it discloses cellular user terminals that include cellular phones. Ex. 1002 (Reddy Decl.), ¶¶73, 219. Specifically, Senoh teaches a "user terminal 1" that accesses a relay server 2 which receives and stores catalog data related to various items of digital content—namely multimedia data such as audio or video. Ex. 1004 (Senoh), ¶¶[0043]-[0044]. This is illustrated in Senoh Figure 2 (below).

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	Claim	Prior Art Disclosures
		Fig.2  Ex. 1004 (Senoh), FIG. 2. The "user terminal" can be a "cellular phone." Ex. 1004 (Senoh), ¶¶[0060], [0074] ("The user terminal 1 could be a personal computer, cellular phone, or television or video deck having a communication function."). As Senoh explains "[i]t will be obvious to one with ordinary skill in the related art that while only one user terminal 1 is shown in the figure, plurality user terminals can be connected." Ex. 1004 (Senoh), ¶[0029]; Ex. 1002 (Reddy Decl.), ¶¶74, 219; Ex. 1006 (Kenner), 8:26-28 ("Only three user terminals are shown; however, it should be recognized that the number of concurrent users of the invention is unlimited, such to the operational details set forth below.")). Senoh further describes a ***method of providing access to content for use on the wireless communication devices.*** Ex. 1002 (Reddy Decl.), ¶74, 219. In addition to allowing users to contact content providers to purchase content, *see, e.g.*, Ex. 1004 (Senoh), ¶¶[0045], [0057]-[0059], Senoh discloses a method of ***providing access to content*** in the form of previews of content through an online catalog. For example, Senoh explains that the "content server 3 . .

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	Claim	Prior Art Disclosures
		. generates and sends catalog data for the content to the relay server 2 in order to market the content to a wider audience." Ex. 1004 (Senoh), ¶[0043]. When the content is video content, "the relay server 2 preferably enables the content highlights to be previewed." *Id.*, ¶[0044]. Users can "select desired content by accessing the bulletin board on the relay server 2 and viewing the catalog." *Id.*, ¶[0045].
[2Ai]	receiving and storing in a server system a plurality of items of digital content to be made available for use in wireless communication devices used by a plurality of wireless services subscribers,	Senoh discloses and renders obvious ***receiving . . . a plurality of items of content to be made available for use in wireless communication devices used by a plurality of wireless services subscribers***. The functionality performed by Senoh's relay server is performed ***in a server system*** and when items of content and their implementations are stored in a database of relay server 2, the steps of ***receiving and storing*** are performed ***in a server system***. Ex. 1002 (Reddy Decl.), ¶¶147, 220. Senoh discloses a catalog with multiple items of content as shown in Figure 4 (below).

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	Claim	Prior Art Disclosures

Fig.4

CONTENT NAME	CONTENT 1	CONTENT 2	...
PREVIEW	PREVIEW OF CONTENT 1 (WITH DIGITAL WATERMARK)	PREVIEW OF CONTENT 2 (WITH DIGITAL WATERMARK)	...
CONTENT RECORDING DATE	2000.6.17	1999.12.31	...
WHO RECORDED THE CONTENT	TARO YAMASHITA	HANAKO UENO	...
TITLE	BATTLE IN PEBBLE BEACH	COUNTDOWN 2000	...
GENRE	SPORTS	EVENT	...
CONTENT TYPE	FINAL (GOLF TOURNAMENT)	NEW YEAR'S EVE	...
DUPLICATION FEE	$10	$5	...
...	...	...	...
CONTACT ADDRESS FOR THE BUYER	abc@def	ghi@jkl	...
			...
WARNING	UNAUTHORIZED ACT OF COPYING IS SUBJECT TO PENALTY		

CATALOG

Ex. 1004 (Senoh), FIG. 4. This figure shows "[a] sample catalog compiling plural catalog entries," from which users can "select desired content by accessing [a] bulletin board on the relay server 2 and viewing the catalog." *Id.*, ¶[0045]. The catalog data is generated by and sent from the content server 3 to the relay server 2. *See* Ex. 1004 (Senoh), ¶¶[0043] ("The content server 3 then generates and sends catalog data for the content to the relay server 2 in order to market the content to a wider audience."), [0044] ("[T]he relay server 2 is a server computer accessible from the network and storing a compiled catalog of plural catalog data entries."). This allows the relay server to store "a compiled catalog of plural catalog data entries." *Id.*, ¶[0044]. Content stored at relay server includes previews of audio or video data. "If the content contains video, the relay server 2 preferably enables the content highlights to be previewed. If the content is audio (music), a selection of a particular length could be provided as a preview." Ex. 1004 (Senoh), ¶[0044]; *see also id.*, FIG. 4. Here, a first item of

	Claim	Prior Art Disclosures
		content is "Preview of Content 1" and a second item of content is "Preview of Content 2" and thus are ***a plurality of items of content*** which are to be made available to user terminals including ***wireless communication devices used by a plurality of wireless services subscribers***. Ex. 1002 (Reddy Decl.), ¶¶76-78, 147, 220. These ***plurality of items of content*** are provided from Senoh's content server 3 and are ***received*** by, and ***stored*** in, the relay server. *See* Ex. 1004 (Senoh), ¶[0043] ("The content server 3 then generates and sends catalog data for the content to the relay server 2 in order to market the content to a wider audience. The catalog data could contain previews of content highlights . . . ."), ¶[0044] ("[T]he relay server 2 is a server computer accessible from the network and storing a compiled product catalog of plural catalog data entries."). These different previews associated with the difference catalog entries (e.g., as shown in FIG. 4) are ***received and stored in*** relay server and constitute ***items of digital content to be made available for use in wireless communication devices used by a plurality of wireless services subscribers***. Ex. 1002 (Reddy Decl.), ¶¶78 (citing Ex. 1011, 2:5-7 and explaining that wireless services for cellular phones were provided as a subscription service using, for example, Subscriber Identity Modules in cellular phones), 147, 220.
[2Aii]	including receiving and storing a plurality of different implementations of at least one of the items of digital content, where each implementation of any given item of digital content corresponds to a different set of device capabilities;	This limitation would have been obvious over Senoh in view of Li. While Senoh describes how items of content (e.g., video and audio previews) are received and stored at the relay server, Senoh does not disclose a mechanism for ensuring that the content displays or is otherwise reproduced in a manner that is appropriate for the specific user terminal capabilities based on the terminal that is requesting to view the content. Ex. 1002 (Reddy Decl.), ¶79, 221. Senoh does not disclose ***receiving and storing a plurality of different implementations of at least one of the items of digital content, where each implementation of any given item of content corresponds to a different set of device capabilities*** to allow wider access to Senoh's catalog previews. A POSITA would have thus looked to a technique to ensure that the user terminals received previews in a format that could be viewed by the terminal. Ex. 1002 (Reddy Decl.), ¶¶¶191, 221. ¶ Li provides a technique that can accomplish this result and present content in the manner best suited for a particular user terminal. Specifically, Li teaches a method and apparatus for adapting multimedia content for diverse client devices including personal digital assistants

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	Claim	Prior Art Disclosures
		(PDAs) and "smart cellular phones." Ex. 1007 (Li), 1:18-21, 1:31-36. The multimedia content is adapted "to optimally match the capabilities of the client device requesting it." *Id.*, 2:19-21. Each content item is "transcoded into multiple resolution and modality versions so that they can be rendered on different devices." *Id.*, 2:24-26. "For example, a video item is transcoded into a selected set of images so that it can be rendered on a device not capable of displaying video." *Id.* Li's invention "permits the transcoded versions of the content items to be generated prior to any requests. Thus, the invention can handle media items such as video and audio which are difficult to handle in conventional proxies. This off-line transcoding also leads to lower response latencies than proxies." Ex. 1007 (Li), 3:4-10. The content adaptation process "can be deployed on the server-side . . . ." *Id.*, 12:11-12. The specific item(s) of information to be served to the client device are determined based on the device capabilities. Ex. 1007 (Li), 6:3-9 ("A client device is characterized by its profile 310 which lists the capabilities 320 and resources 300 of the device. . . . A client may have a different number of capabilities 320 and resources 330."); *id.*, 6:42-47 ("A content adaptation process 350 uses the client profile 3109 to select from among the InfoPyramids 280 the versions 374 that best satisfy the particular client profile. These selected versions are rendered into a document 370 which is an adaptation (i.e., customization) of the original multimedia document 100."). A POSITA would have understood that while Senoh teaches a product catalog that includes information about multiple items of content including text and video clips that are provided from content creators, *see* Ex. 1004 (Senoh), ¶¶[0043]-[0045], FIG. 4; Ex. 1002 (Reddy Decl., ¶¶190-191, 204, 234, Senoh does not describe techniques for ensuring that the catalog can be accessed by devices with different device capabilities to ensure that the content provided from the catalog can be viewed on the client devices. Ex. 1002 (Reddy Decl.), ¶¶190-191, 204, 234. Therefore, the POSITA would have looked at prior art solutions to make the catalog as accessible to end-users as possible to achieve the goal of allowing the content to be marketed to "a wider audience" as taught by Senoh. Ex. 1004 (Senoh), ¶[0043]; Ex. 1002, ¶¶207, 234. A POSITA would have found a solution in Li and would have been led to look to Li for such a solution for several reasons. First, a POSITA knew that content creators wanted to have control over how the different versions of their content displayed on devices. Ex. 1002 (Reddy Decl.), ¶¶209, 234; Ex. 1008

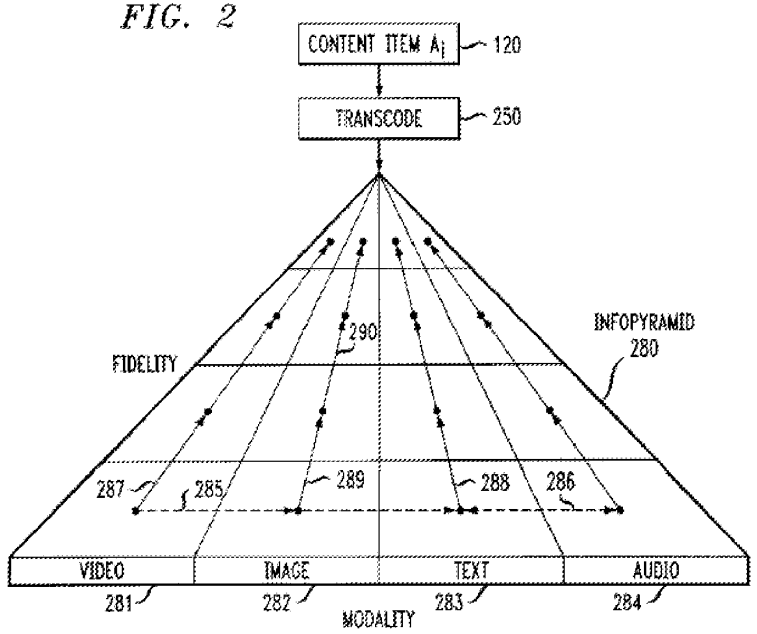
EX1014 - Page 816

	Claim	Prior Art Disclosures
		(Britton), p.156 ("The primary advantages of static transcoding are quality of presentation and performance.[] Each page is constructed by a human designer, generally working with tools that show how the application will look or sound and thus allowing the presentation to be hand-tailored for each environment."). To provide content creators the ability to control the appearance of different implementations of their content, the POSITA would have seen a benefit to having the content server maintain different, preformatted implementations of the previews, and provide those to Senoh's relay server to market the content to a wider audience. Ex. 1002 (Reddy Decl.), ¶¶209, 234; Ex. 1004 (Senoh), ¶[0044] (catalog for marketing to wider audience). Second, a POSITA knew that latency in viewing content on the Web affected the user experience. Ex. 1002 (Reddy Decl.), ¶¶210, 234. Thus, using the same transcoding processes that Senoh uses for purchased full-length content would have been unattractive for Senoh's previews. Ex. 1002 (Reddy Decl.), ¶¶210, 234. A POSITA would have understood from Senoh that content in the catalog originated from different content creators/copyright holders. Ex. 1002 (Reddy Decl.), ¶¶210, 234. Specifically, Senoh explains that the copyright holder and content server computers could be the same machines, Ex. 1004 (Senoh), ¶[0032], that each copyright holder receives a unique ID, *id.*, ¶[0034], and that the relay server stores a catalog with content from multiple copyright holders, *id.*, ¶[0054], FIG. 5; Ex. 1002 (Reddy Decl.), ¶¶210, 234. Therefore, to implement a system where the content server maintains the previews until requested would have caused the content to be fetched when the catalog data was requested, sent to the relay server, transcoded at the relay server, and sent to the user terminal, from each of the content servers that provided catalog content. This would have added latency to the system, resulting in a potentially frustrating user experience that could lead to the perception that the service was poor quality. Ex. 1002 (Reddy Decl.), ¶¶210, 234. Therefore, transcoding the preview content in advance like Agraharam does would have been seen as a way to reduce latency for resource intensive audio and video content like Senoh's previews. *Id.* And, while users might be willing to wait for content to be transcoded after they pay for it and await its delivery, users may be less tolerant of delays while viewing a number of different previews in the catalog while browsing for something they may want to buy. *Id.* Thus, the POSITA would have been led to look to Kenner for a solution to the

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	Claim	Prior Art Disclosures
		problem of ensuring content was delivered to devices in a format they could properly view. *Id.* Third, storing multiple implementations of an item of content (previews) is one of a finite number of predictable solutions available to the POSITA for enabling content to be tailored to the user terminals requesting Senoh's previews. Ex. 1002 (Reddy Decl.), ¶¶211, 234. Indeed, besides receiving and storing different implementations of items of content, one implementation could be received and transcoded at the relay server; implementations may be transcoded on the fly from a single implementation, or, contrary to Senoh's teachings, the catalog content could be kept at content servers and either transcoded there statically or dynamically. *Id.* These solutions all had predictable results as the concepts of "static" transcoding and "dynamic" transcoding were discussed in the literature and had known implications. *See, e.g.*, Ex. 1008, pp.154-157. The POSITA would have seen that Li teaches a way of transcoding content into numerous different formats to create what Li calls "InfoPyramids." Ex. 1007 (Li), 2:40-47, 5:66-6:2 ("As shown in FIG 2, the content items 120 of a multimedia document 100 are transcoded (250) into multiple modality and fidelity versions to generate a set of InfoPyramids 280."); Ex. 1002 (Reddy Decl), ¶¶192-195, 221.

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	Claim	Prior Art Disclosures
		FIG. 2  Ex. 1007 (Li), FIG. 2. Therefore, Li teaches transcoding content items into ***a plurality of different implementations of at least one of the items of content, where each implementation of any given item of content correspondents to a different set of device capabilities***. Ex. 1002 (Reddy Decl.), ¶¶195, 221. As taught in Li, based on the client device capabilities and resources provided in a client device profile, an appropriate implementation of the item of content can be selected for the device, e.g., "all versions that are in video modality can be filtered out if the device is not capable of displaying video" and "all versions that are color images can be filtered out for a device that has only a black and white or gray-level screen." Ex. 1007 (Li), 6:52-56. The POSITA would have looked to Li to improve Senoh's catalog display techniques because Li provides a way to optimize the delivery of multimedia content to user devices. Ex. 1002 (Reddy Decl.), ¶¶197, 207, 221.

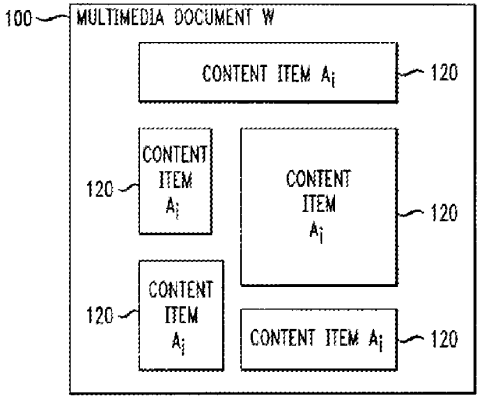
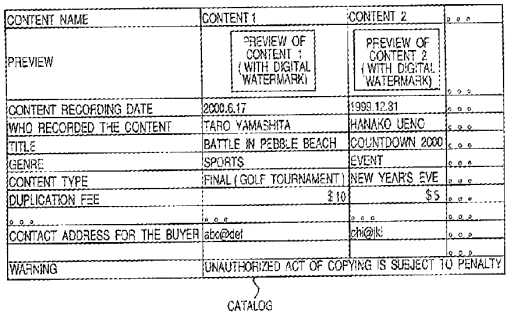
EX1014 - Page 819

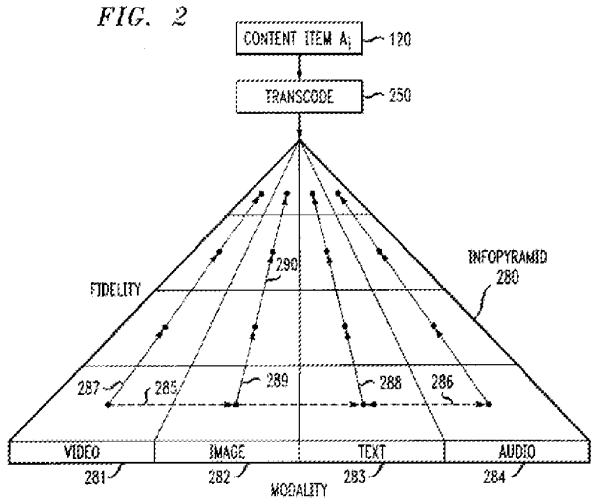
	Claim	Prior Art Disclosures
		It would have been obvious to transcode preview content in Senoh's content servers to create InfoPyramids using techniques taught in Li so that InfoPyramids could be provided to relay servers to enable selection of the best way to present content to a particular user terminal based on a device's capabilities and resources as taught in Li to address the known problem that different devices had different display capabilities and not all content was properly formatted for all devices. Ex. 1002 (Reddy), ¶205, 221. A POSITA would have found the inclusion of Li's known technique would have improved Senoh's catalog system in the same way that improved Li's system for allowing various devices to view content tailored to the device. *Id.*, ¶212, 234. And, applying the Li techniques to content for Senoh's catalog would allow for consumers of video content to browse the catalog for content using a variety of devices thus accomplishing the intended goal of Senoh's product catalog—i.e., "to market the content to a wider audience." Ex. 1004 (Senoh), ¶[0043]. Moreover, applying Li's technique for adapting content to a variety of user terminals including "PDAs" and "smart cellular phones," Ex. 1007 (Li), 1:31-36, would have merely applied Li's known technique for transcoding various types of content such as Senoh's text and video and audio clips into different fidelity and/or modalities to allow as many users to view the content as possible from their mobile devices, *id.*, 4:58-67; Ex. 1002 (Reddy Decl.), ¶214, 234. Applying Li to Senoh's catalog technique would have improved Senoh in the same way as it improved Li. Ex. (Reddy Decl.) 1002, ¶¶215, 234. At the very least, applying Li's techniques on the data to be served to the relay server from Senoh's content servers for use in Senoh's catalogs would have improved upon Senoh in a predictable manner—by allowing catalog content to be tailored for many different types of devices so that the content could be marketed to wider audiences. Ex. 1002 (Reddy Decl.), ¶¶215, 234. The POSITA would have reasonably expected to succeed in combining Senoh and Li because Li's transcoding techniques were known and predictable and combining them with Senoh would have merely combined the known transcoding techniques with known and Internet-based technologies to provide Senoh's product catalog to user devices. Ex. 1002 (Reddy Decl.), ¶¶216, 234.
[2B]	operating the server system to maintain a product catalog	Senoh's relay server—i.e., a ***server system***—is operated to ***maintain a product catalog containing a description of the items of digital content***. Specifically, Senoh explains that

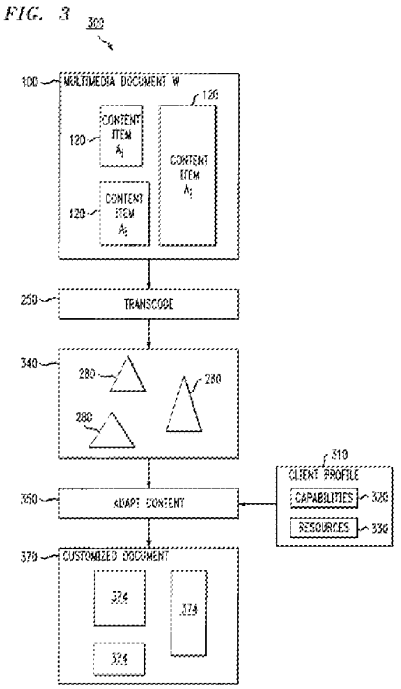
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	Claim	Prior Art Disclosures
	containing a description of the items of digital content wherein the product catalog includes, in association with each item of digital content, a reference to each implementation of said item of digital content;	"content server 3 . . generates and sends catalog data for content to the relay server 2 in order to market the content to a wider audience." Ex. 1004 (Senoh), ¶[0043]. "[T]he relay server 2 is a server computer accessible from the network and storing a compiled catalog of plural catalog data entries." *Id.*, ¶[0044]. "A sample catalog compiling plural catalog data entries is shown in FIG. 4." *Id.*, ¶[0045]. *Fig.4* CONTENT NAME | CONTENT 1 | CONTENT 2 | ° ° ° PREVIEW | PREVIEW OF CONTENT 1 (WITH DIGITAL WATERMARK) | PREVIEW OF CONTENT 2 (WITH DIGITAL WATERMARK) | ° ° ° CONTENT RECORDING DATE | 2000.6.17 | 1999.12.31 | ° ° ° WHO RECORDED THE CONTENT | TARO YAMASHITA | HANAKO UENO | ° ° ° TITLE | BATTLE IN PEBBLE BEACH | COUNTDOWN 2000 | ° ° ° GENRE | SPORTS | EVENT | ° ° ° CONTENT TYPE | FINAL (GOLF TOURNAMENT) | NEW YEAR'S EVE | ° ° ° DUPLICATION FEE | $10 | $5 | ° ° ° ° ° ° | ° ° ° | ° ° ° | ° ° ° CONTACT ADDRESS FOR THE BUYER | abc@def | ghi@jkl | ° ° ° | | | ° ° ° WARNING | UNAUTHORIZED ACT OF COPYING IS SUBJECT TO PENALTY CATALOG Ex. 1004 (Senoh), FIG. 4. Senoh does not explicitly teach that the product catalog ***includes, in association with each item of digital content, a reference to each implementation of said item of digital content***. But, this feature would have been obvious over the combined teachings of Senoh and Li. As explained in connection with *Limitation [1Aii]*, above, it would have been obvious to store

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	Claim	Prior Art Disclosures
		multiple implementations (formats) of Senoh's catalog content at Senoh's relay server in data structures such as Li's InfoPyramids based on Li's teachings. In doing so, a POSITA would have understood that ***a reference to each implementation of said item of digital content*** was needed to identify the specific InfoPyramid for a specific item of information. More specifically, a POSITA would have understood that there needed to be a reference from the content items—e.g., Senoh's previews—and the InfoPyramid that defines various implementations of that content item stored at the relay server. Ex. 1002 (Reddy Decl.), ¶¶200-202, 222. Such a reference is needed to tie the items (previews) in the catalog to the InfoPyramid including the implementations and without such a reference the system would not be able to correlate items to InfoPyramids. Ex. 1002 (Reddy Decl.), ¶¶202, 222. As Li explains, a "multimedia document," includes "a number of content items Ai, denoted as reference numeral 120, where i=1, 2, . . . , n." Ex. 1007 (Li), 4:10-13. The POSITA would have observed that Li's multimedia documents are a generic way to represent Senoh's product catalog. Ex. 1002 (Reddy), ¶200, 222. This can be seen in the illustration below:  *Fig.4*  Ex. 1007 (Li), FIG. 1; Ex. 1004 (Senoh), FIG. 4. Here, different fields such as the preview of "Content 1" maybe one content item A_i and the preview of "Content 2" may be another item of content Ai in Li's FIG. 1. Ex. 1002 (Reddy Decl.), ¶¶202, 222. Additionally, the text

	Claim	Prior Art Disclosures
		information for a particular item of content may represent another content item Ai and so on. Ex. 1002 (Reddy Decl.), ¶¶199, 202, 222. According to Li's teachings, each item of content Ai is transcoded into a number of different representations and stored in the InfoPyramid data structure as illustrated below in FIG. 2: *FIG. 2*  Ex. 1007 (Li), FIG. 2. When a document (e.g., Senoh's product catalog) includes multiple items of information with multiple components, each of the items can be represented in its own InfoPyramid (280), as indicated in Li's FIG. 3:

	Claim	Prior Art Disclosures
		FIG. 3  Ex. 1007 (Li), FIG. 3. Thus, a document such as Senoh's product catalog includes a number of content items (e.g., text, video previews) that each provide a ***product catalog*** which includes ***in association with each item of content*** (e.g., "Content 1's" preview) ***a reference to each implementation of said item of content***—i.e., a reference to the particular InfoPyramid that includes the "multiple representations of a multimedia item . . . organized into a pyramid-like data structure, as illustrated in FIG. 2." Ex. 1007 (Li), 4:58-61. These different implementations are further described by Li as follows: "The cells of the pyramid correspond to different representations of the objects using different modalities such as, for example, video 281, image 282, audio 283 and text 284, and fidelities such as in the range of full-resolution

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	Claim	Prior Art Disclosures
		(bottom of the pyramid) to low-resolution (top of the pyramid). A specific version of a multimedia item can be referred to by one of the cells." Ex. 1007 (Li), 4:61-67. The POSITA would have understood that in implementing Senoh's product catalog using Li's InfoPyramids, each item of information—e.g., preview of Content 1 or a preview of Content 2—would be associated with multiple implementations of that item as defined in the InfoPyramid and that the process of selecting which, if any, implementation is to be provided to the user terminal required use of a ***reference to*** the specific InfoPyramid—i.e., to ***each implementation of said item of content*** to allow selection of the appropriate item of content for the end user terminal. Ex. 1002 (Reddy Decl.), ¶¶202, 217, 222. It would have been obvious to use Li's InfoPyramid techniques to provide items of content and implementations of items of content to Senoh's relay server for the product catalog for the reasons discussed above in connection with *Limitation [1Aii]* and in doing so, the POSITA would have been led to link information items (e.g., content items) with InfoPyramids as taught by Li to enable the system to operate properly. Ex. 1002 (Reddy Decl.), ¶¶217, 222.
[2C]	receiving a request from a wireless device used by one of the subscribers;	The combination of Senoh and Li render the step of ***receiving a request from a wireless device used by one of the subscribers*** obvious. Senoh teaches that a user accesses a catalog including "plurality catalog data entries." Ex. 1004 (Senoh), ¶[0045]. This catalog is stored on the relay server. Ex. 1004 (Senoh), ¶¶[0043]-[0044]. The catalog "can be posted to a common bulletin board (electronic bulletin board) accessible from the network," which allows "users to "select desired content by accessing the bulletin board on the relay server 2 and viewing the catalog." *Id.*, ¶[0045]. A POSITA would have understood that in order to view content stored at the relay server, the client device—i.e., the claimed ***wireless device*** would need to request that information and that the request would need to be received by the relay server. Ex. 1002 (Reddy Decl.), ¶¶224-226. Based on this request, the catalog data from the electronic bulletin board would be provided to the client device according to the teachings of Senoh. Li also describes ***receiving a request*** from a client device for content stored on a server. As Li explains, "[a]s is well known, a Web user (client) makes a request from his client device

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	Claim	Prior Art Disclosures
		for some particular Web document(s) or other multimedia content which may contain video, images, graphics, text, audio. The request is sent to a Web server which satisfies the request by returning the requested document to the client." Ex. 1007 (Li), 4:5-10. A POSITA would have understood that the request discussed by Li would have been used in the context of Senoh to request the product catalog from the relay server. Ex. 1002 (Reddy Decl.), ¶226. Therefore, both Senoh and Li teach a step of ***receiving a request from a wireless device used by one of the subscribers*** and it would have been obvious to use such a request to receive product catalog data in connection with a combined system according to Senoh and Li.
[2D]	in response to the request, selecting a portion of the product catalog to be presented to the subscriber, based on device capabilities of the wireless device used by the subscriber; and	The combination of Senoh and Li renders obvious ***in response to the request, selecting a portion of the product catalog to be presented to the subscriber, based on the capabilities of the wireless device used by the subscriber.*** As explained above in connection with *Limitation [2Aii]*, it would have been obvious to use the Li's techniques in combination with Senoh's product catalog to ensure that properly formatted video and audio data are served from Senoh's relay server to user terminals viewing the product catalog previews. In the combined system, a request is made from a client device/user terminal to view the product catalog. According to Li's teachings, the user device capabilities can be provided to the server in various ways: > The client device profile can be obtained by a number of mechanisms. For example, the User-Agent fields in the HTTP (hyper text transport protocol) request header contain information about the browser and often the operating system. Also, Windows-CE devices specify the screen size, color depth and processor. Ex. 1007 (Li), 6:30-35. Li also explains that information that cannot be viewed on the client is excluded from being served to the client. For example, Li explains "the versions from the InfoPyramids that do not meet client capabilities 320 are filtered out. For example, all versions that are in video modality can be filtered out if the device is not capable of displaying video. Similarly, all

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	Claim	Prior Art Disclosures
		versions that are color images can be filtered out for a device that has only a black and white or gray-level screen." Ex. 1007 (Li), 6:49-56; *see also id.*, 10:62-65 ("Before we start the resource allocation process, we remove from consideration all the versions of items that a client is not capable of handling."). Then, the appropriate version of the content to send in response to the request is chosen from the versions that are not filtered out. *Id.*, 6:64-67 ("Then, in step 470, the resources allocated for each InfoPyramid are used to select the appropriate version 374, which has not been previously filtered out in step 420, to render the customized multimedia document 370."). In this way, a ***portion of the product catalog*** is selected ***based on the device capabilities of the wireless device used by the subscriber.*** *See* Ex. 1002 (Reddy Decl.), ¶¶228-230. Thus, in the combined Senoh-Li system, in response to the request—i.e., request for the product catalog from a client device—a portion of the product catalog is selected from the relay server to be presented to the subscriber on their terminal. There are two phases to the selection of the portion of the product catalog to convey for each item of information—including video preview: (1) filtering out content that cannot be displayed by the client device, and (2) identifying the correct item from the InfoPyramids that have not been filtered out based on the resource allocation process. These processes are performed ***based on the device capabilities of the wireless device used by the subscriber*** provided from the client device as described above. *See also* Ex. 1007 (Li), 6:42-44 ("The content adaptation process 350 uses the client profile 310 to select from among the InfoPyramids 280 the versions 374 that best satisfy the particular client profile."); Ex. 1002 (Reddy Decl.), ¶¶229-230. And, only ***a portion of the product catalog*** is selected because the preview content is only provided in one format (if at all)—and content that is not supported or not deemed optimal for a particular device according to the received profile, are not presented to the subscriber. Ex. 1002 (Reddy Decl.), ¶¶229-230.
[2E]	presenting the selected portion of the product catalog to the subscriber via a wireless network, such that the selected portion, as presented to the subscriber,	The combination of Senoh and Li renders obvious ***presenting the selected portion of the product catalog to the subscriber via a wireless network, such that the selected portion, as presented to the subscriber, provides only a single description of each item of digital content in said portion, regardless of the number of implementations of each said item.***

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	Claim	Prior Art Disclosures
	provides only a single description of each item of digital content in said portion, regardless of the number of implementations of each said item.	A subscriber using the cellular phone described by Senoh to view the product catalog including video previews, Ex. 1004, ¶¶[0044], [0060], [0074], in which the techniques of Li are used to select a preview in the appropriate format for viewing on the user terminal would be presented with ***the selected portion of the product catalog via a wireless network***. Ex. 1002 (Reddy Decl.), ¶¶232-233; Ex. 1004 (Senoh), ¶[0045] ("The catalog can be posted to a common bulletin board (electronic bulletin board) accessible from the network."); Ex. 1007 (Li), 4:8-10 ("The request is sent to a Web server which satisfies the request by returning the requested document to the client."). A POSITA would have understood that the product catalog from Senoh would have been presented to a subscriber using a mobile device via a wireless network because web-accessible pages such as Senoh's bulletin board were presented in response to requests made from clients over a network. Ex. 1002 (Reddy Decl.), ¶¶232-233. Based on the combined teachings of Senoh and Li, the ***selected portion, as presented to the subscriber, provides only a single description of each item of digital content in said portion, regardless of the number of implementations***. This is because Senoh's catalog would have been presented in an optimal format for the particular end-user device as selected from the Li InfoPyramids. Ex. 1007 (Li), 6:49-67 (explaining that "versions from the InfoPyramids 280 that do not meet client capabilities 320 are filtered out" and "resources allocated for each InfoPyramid are used to select the appropriate version 347, which has not been previously filtered out in step 420, to render the customized multimedia document 370"). Thus, the customized multimedia document, such as Senoh's product catalog will only include a ***portion of the product catalog, which provides only a single description of each item of digital content regardless of how many implementations of each item of information.*** Ex. 1002 (Reddy Decl.), ¶233. For instance, while Li's InfoPyramids may include several different implementations of a particular preview of a video in Senoh's catalog, only one description of the item including preview and any associated text is ultimately provided to the subscriber. *Id.*
[4P]	A method as recited in claim 2, further comprising:	*See* claim 2, above.

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	Claim	Prior Art Disclosures
[4A]	receiving from the subscriber a request for one of the items of digital content in said portion of the product catalog;	Senoh discloses or renders obvious a step of ***receiving from the subscriber a request for one of the items of digital content in said portion of the product catalog.*** Specifically, Senoh explains that a user can select an item of digital content from the catalog and request that it be delivered to their device. For instance, Senoh teaches: > A sample catalog compiling plural catalog data entries is shown in FIG. 4. The catalog can be posted to a common bulletin board (electronic bulletin board) accessible from the network. Users can then select desired content by accessing the bulletin board on the relay server 2 and viewing the catalog. It should be further noted that the content ID is also contained in the preview data extracted from the content. Ex. 1004 (Senoh), ¶[0045]. > The user terminal 1 is described next. The user terminal 1 is the terminal or computer whereby a user views the bulletin board 25 containing the catalog data, views previews of content from the catalog data on the bulletin board 25, and views or listens to the content. If there is content that the user wishes to purchase, the user sends a purchase request to the content provider (marketer or copyright holder of the content on the content server 3). This request contains the e-mail address or other information specifying the content provider or other party marketing the content. When the content server 3 receives such a purchase request, it sends a request for credit card information, electronic money, or other payment method to the user terminal 1. The content server 3 also requests the format supported by the user terminal 1 for viewing the content.

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	Claim	Prior Art Disclosures
		Id., ¶[0057]. Therefore, Senoh teaches and renders obvious ***receiving from the subscriber a request for one of the items of digital content in said portion of the product catalog***. Ex. 1002 (Reddy Decl.), ¶¶237-238.
[4B]	selecting an implementation of the requested item of digital content, based on device capabilities of the wireless device used by the subscriber; and	Senoh discloses and renders obvious a step of ***selecting an implementation of the requested item of digital content, based on device capabilities of the wireless device used by the subscriber***. After the user provides a request for an item of content, "[t]he content server . . . requests the format supported by the user terminal 1 for viewing the content." Ex. 1004 (Senoh), ¶[0057]. Content is provided from the content server to the relay server, and then from the relay server to the user terminal. *Id.*, ¶¶[0058]-[0059]. The implementation of the content—i.e., the format—provided by the relay server 2 is selected based on the device capabilities (i.e., the "format supported by the user terminal 1 for viewing the content") of the wireless device used by the subscriber. Specifically, Senoh teaches: > If the format of the content sent to the relay server 2 differs from the format required by the user terminal 1, the relay server 2 converts the received format to the format viewable by the user terminal 1, and then transmits the content to the user terminal 1. The term "viewable" means that the user terminal 1 supports the format in which the content will be reproduced, or can display the content at the performance of the output display (the display performance of the monitor) of the user terminal 1. Ex. 1004 (Senoh), ¶[0059]. Therefore, a POSITA would have understood that Senoh teaches that an implementation of the content from content server is selected based on device capabilities (i.e., required format) for the wireless device. Ex. 1002 (Reddy Decl.), ¶240. For example, Senoh explains that content may be provided from content server in a format for HDTV, but may be downsampled to meet the requirements for a wireless device: > While the format specification includes the encoding method, resolution, and other parameters, a process for converting content

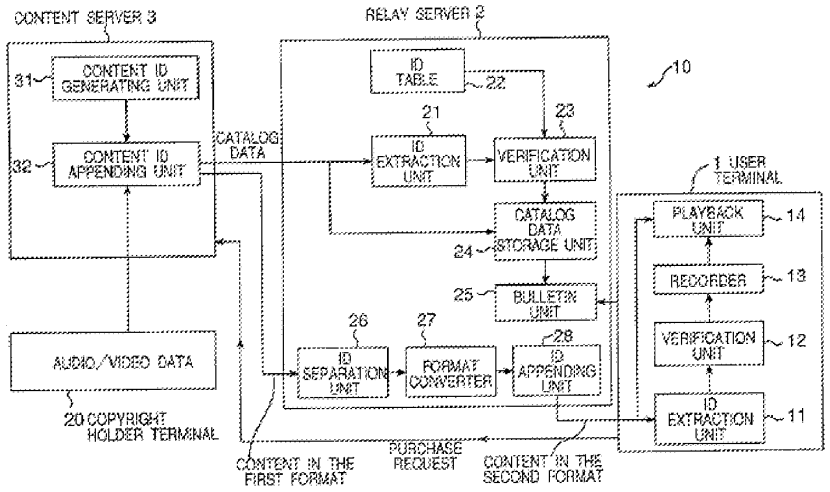
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	Claim	Prior Art Disclosures
		in MPEG-2 main profile, high level format (such as HDTV format) to content in MPEG-4 simple profile, level 0 format (such as Quarter Common Intermediate Format (QCIF)) is used by way of example. This conversion process enables the user to view content using a cellular phone or other user terminal 1 on which content cannot be viewed in the normal TV format. * * * * * The copyright holder produces MPEG-2 main profile, high level AV data conforming to the HDTV format, and sends this data to the content server **3**. The content ID appending unit **32** of the content server **3** generates content in first format by adding content ID as a digital watermark encrypted using a public key encryption scheme to the AV data. The content server **3** sends content in this first format to the relay server **2**. * * * * * The format converter 27 then downsamples the MPEG-2 main profile, high level format AV data obtained by the ID separation unit 26 to MPEG-4 simple profile, level 0 format AV data. Using the procedure described above for adding a digital watermark, the ID appending unit 28 of the relay server 2 then adds the extracted content ID to the converted AV data to output data formatted to the second format specification. The ID appending unit 28 sends the reformatted content to the user terminal 1 (FIG. 1). Ex. 1004 (Senoh), ¶¶[0060]-[0061], [0064].
[4C]	downloading the selected implementation of the item of digital content to the	Senoh discloses and renders obvious a step of ***downloading the selected implementation of the item of digital content to the wireless device used by the subscriber.***

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	Claim	Prior Art Disclosures
	wireless device used by the subscriber.	Specifically, Senoh teaches that in response to the request for content from the end-user, the relay server downloads the implementation selected based on the format requirements of the device to the wireless device (i.e., cellular phone) used by the subscriber. *See, e.g.*, Ex. 1004 (Senoh), ¶¶[0058] ("If the format of the content received from the content server 3 is the same as format specified by the user, the relay server 2 simply sends the content directly to the user terminal 1."), [0059] ("If the format of the content sent to the relay server 2 differs from the format required by the user terminal 1, the relay server 2 converts the received format to the format viewable by the user terminal 1, and then transmits the content to the user terminal 1."), [0060] ("This conversion process enables the user to view content using a cellular phone or other user terminal 1 on which content cannot be viewed in the normal TV format."), [0073] ("The content can then be sent to the user terminal 1 so that the user can enjoy viewing the content while simultaneously appropriately protecting the copyright of the content owner."); *see also* Ex. 1002 (Reddy Decl.), ¶242.
[8P]	A system comprising:	The preamble is not a limitation of the claim. However, even if the preamble is interpreted as being a limitation of the claim, Senoh discloses a system, such as the content distribution system shown in FIG. 2. *See, e.g.*, Ex. 1004 (Senoh), ¶¶[0002] ("This invention relates to controlling an electronic distribution system for distributing digital multimedia content, including audio and video, by way of a network."), [0010] ("An object of this invention is therefore to provide an electronic distribution system . . . ."), [0030] ("The configuration of this content distribution system is described in greater detail below with reference to FIG. 2.").

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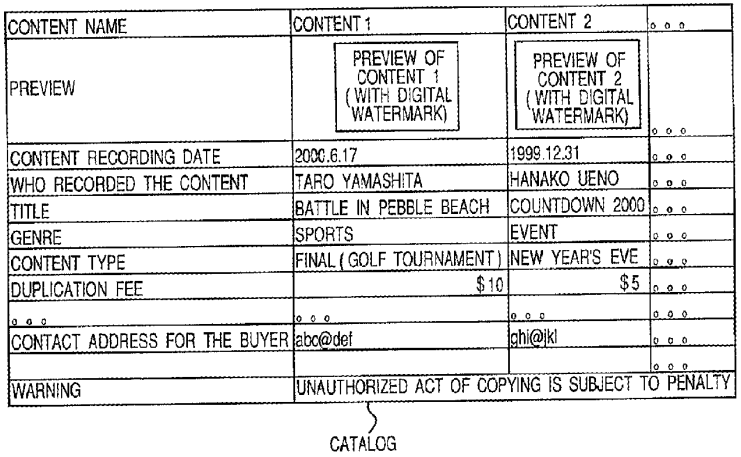
	Claim	Prior Art Disclosures
		Fig.2  Ex. 1004 (Senoh), FIG. 2; *see also* Ex. 1002 (Reddy Decl.), ¶244.
[8A]	a network interface through which to communicate over a communication network; and	Senoh discloses or renders obvious a ***network interface through which to communicate over a communication network***. Specifically, Senoh teaches that "[c]ontent distribution system 10 has a user terminal 1, relay server 2, and content server 3. The user terminal 1, relay server 2, and content server 3 are each connected to a communication network 4, such as the Internet through which they can communicate with each other." Ex. 1004 (Senoh), ¶[0029]. A POSITA would have understood that the interface between hardware connected to the network and the network itself is a network interface, and therefore would have appreciated at there is a network interface in each of the relay server, content server, and user terminal that allows data to be communicated from these systems over the network such as the Internet. Ex. 1002 (Reddy Decl.), ¶¶108, 245.
[8B]	a download manager to	Senoh discloses and renders obvious ***a download manager***. As used in the '790 Patent, the term "download manager" refers to an application server in the server system with the capabilities described below in *Limitations 8Bi-8Biii*. *See* Ex. 1001, 3:66-4:1 ("The server system includes an application server referred to herein as a 'download manager.'").

	Claim	Prior Art Disclosures
		In Senoh, the claimed "download manager" is the relay server. *See, e.g.*, Ex. 1004 (Senoh), FIGS. 1 & 2; ¶¶[0029] ("The relay server 2 converts the content received form the content server 3 in the first format to a second format specification, and sends the reformatted content to the user terminal. 1."), [0043]-[0045] (describing catalog provided by relay server), [0046] (describing relay server). As explained in further detail below, a POSITA would have understood Senoh's relay server functionality to constitute a download manager, and that the capabilities required by *Limitations 8Bi-8Biii* would have been obvious over Senoh in view of Li. Ex. 1002 (Reddy Decl.), ¶109, 246.
[8Bi]	receive and store a plurality of items of content to be made available for use in wireless communication devices used by a plurality of wireless telecommunications subscribers,	Senoh discloses and renders obvious a download manager to ***receive and store a plurality of items of content to be made available for use in wireless communication devices used by a plurality of wireless telecommunications subscribers.*** Senoh teaches ***receiving and storing a plurality of items of content*** in the relay server in because Senoh's relay server receives previews of the content made available from copyright holders using Senoh's system. An example of content stored in the relay server (2) disclosed in Senoh is provided in Figure 4 (below).

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	Claim	Prior Art Disclosures

Fig.4



Ex. 1004 (Senoh), FIG. 4 (showing previews displayed in product catalog). This figure shows "[a] sample catalog compiling plural catalog entries," from which users can "select desired content by accessing [a] bulletin board on the relay server 2 and viewing the catalog." *Id.*, ¶[0045]. Thus, the relay server stores "a compiled catalog of plural catalog data entries." *Id.*, ¶[0044]. Content stored at relay server includes previews of audio or video data: "If the content contains video, the relay server 2 preferably enables the content highlights to be previewed. If the content is audio (music), a selection of a particular length could be provided as a preview." Ex. 1004 (Senoh), ¶[0044]; *see also id.*, FIG. 4. Here, a first item of content is "Preview of Content 1" and a second item of content is "Preview of Content 2," and thus are ***a plurality of items of content*** which are to be made available to user terminals including ***wireless communication devices used by a plurality of wireless services subscribers***. Ex. 1002 (Reddy Decl.), ¶¶76-77, 189, 247.

These ***plurality of items of content*** are provided from Senoh's content server 3 and are ***received*** by, and ***stored*** in, the relay server. *See* Ex. 1004 (Senoh), ¶[0043] ("The content server 3 then generates and sends catalog data for the content to the relay server 2 in order to market the content to a wider audience. The catalog data could contain previews of content

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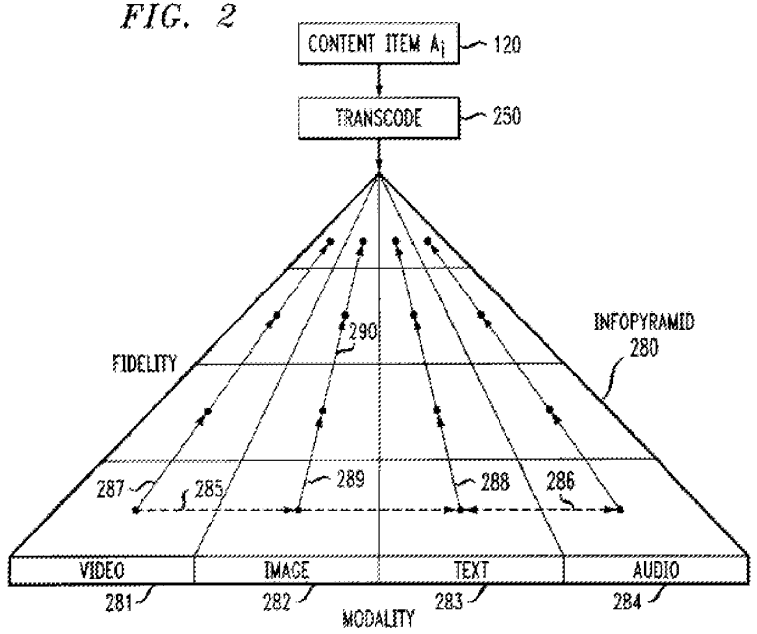
	Claim	Prior Art Disclosures
		highlights . . . ."), ¶[0044] ("[T]he relay server 2 is a server computer accessible from the network and storing a compiled product catalog of plural catalog data entries."). These different previews associated with the difference catalog entries (e.g., as shown in FIG. 4) are ***received and stored in*** relay server and constitute ***items of digital content to be made available for use in wireless communication devices used by a plurality of wireless services subscribers***. Ex. 1002 (Reddy Decl.), ¶¶78 (citing Ex. 1011, 2:5-7 and explaining that wireless services for cellular phones were provided as a subscription service using, for example, Subscriber Identity Modules in cellular phones), 189, 247.
[8Bii]	including receiving a plurality of different implementations of at least one of the items of content, where each implementation of any given item of content corresponds to a different set of device capabilities; and	This limitation would have been obvious over Senoh in view of Li. While Senoh describes how items of content (e.g., video and audio previews) are received at the relay server, Senoh does not disclose a mechanism for ensuring that the content displays or is otherwise reproduced in a manner that is appropriate for the specific user terminal capabilities based on the terminal that is requesting to view the content. Ex. 1002 (Reddy Decl.), ¶¶79, 190, 248. In connection with the catalog previews, Senoh does not disclose ***receiving a plurality of different implementations of at least one of the items of digital content, where each implementation of any given item of content corresponds to a different set of device capabilities.*** A POSITA would have thus looked to a technique to ensure that the user terminals received previews in a format that could be viewed by the terminal. Ex. 1002 (Reddy Decl.), ¶191, 248. Li provides a technique that can accomplish this result and present content in the manner best suited for a particular user terminal. Specifically, Li teaches a method and apparatus for adapting multimedia content for diverse client devices including personal digital assistants (PDAs) and "smart cellular phones." Ex. 1007 (Li), 1:18-21, 1:31-36. The multimedia content is adapted "to optimally match the capabilities of the client device requesting it." *Id.*, 2:19-21. Each content item is "transcoded into multiple resolution and modality versions so that they can be rendered on different devices." *Id.*, 2:24-26. "For example, a video item is transcoded into a selected set of images so that it can be rendered on a device not capable of displaying video." *Id.* Li's invention "permits the transcoded versions of the content items to be generated prior to any requests. Thus, the invention can handle media items such as video and audio which are difficult to handle in conventional proxies. This off-line transcoding also leads to lower response latencies than proxies." Ex. 1007 (Li), 3:4-10. The content adaptation

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	Claim	Prior Art Disclosures
		process "can be deployed on the server-side . . . ." *Id.*, 12:11-12. The specific item(s) of information to be served to the client device are determined based on the device capabilities. Ex. 1007 (Li), 6:3-9 ("A client device is characterized by its profile 310 which lists the capabilities 320 and resources 300 of the device. . . . A client may have a different number of capabilities 320 and resources 330."); *id.*, 6:42-47 ("A content adaptation process 350 uses the client profile 3109 to select from among the InfoPyramids 280 the versions 374 that best satisfy the particular client profile. These selected versions are rendered into a document 370 which is an adaptation (i.e., customization) of the original multimedia document 100."). A POSITA would have understood that while Senoh teaches a product catalog that includes information about multiple items of content including text and video clips that are provided from content creators, *see* Ex. 1004 (Senoh), ¶¶[0043]-[0045], FIG. 4; Ex. 1002 (Reddy Decl., ¶¶190-191, 204, 248, Senoh does not describe techniques for ensuring that the catalog can be accessed by devices with different device capabilities to ensure that the content provided from the catalog can be viewed on the client devices. Ex. 1002 (Reddy Decl.), ¶¶190-191, 204, 248. Therefore, the POSITA would have looked at prior art solutions to make the catalog as accessible to end-users as possible to achieve the goal of allowing the content to be marketed to "a wider audience" as taught by Senoh. Ex. 1004 (Senoh), ¶[0043]; Ex. 1002, ¶¶207, 248. A POSITA would have found a solution in Li and would have been led to look at Li for such a solution for several reasons. First, a POSITA knew that content creators wanted to have control over how the different versions of their content displayed on devices. Ex. 1002 (Reddy Decl.), ¶¶209, 250; Ex. 1008 (Britton), p.156 ("The primary advantages of static transcoding are quality of presentation and performance.[] Each page is constructed by a human designer, generally working with tools that show how the application will look or sound and thus allowing the presentation to be hand-tailored for each environment."). To provide content creators the ability to control the appearance of different implementations of their content, the POSITA would have seen a benefit to having the content server maintain different, preformatted implementations of the previews, and provide those to Senoh's relay server to market the content to a wider audience. Ex. 1002 (Reddy Decl.), ¶¶209, 250; Ex. 1004 (Senoh), ¶[0044] (catalog for marketing to wider audience).

	Claim	Prior Art Disclosures
		Second, a POSITA knew that latency in viewing content on the Web affected the user experience. Ex. 1002 (Reddy Decl.), ¶¶210, 250. Thus, using the same transcoding processes that Senoh uses for purchased full-length content would have been unattractive for Senoh's previews. Ex. 1002 (Reddy Decl.), ¶¶210, 250. A POSITA would have understood from Senoh that content in the catalog originated from different content creators/copyright holders. Ex. 1002 (Reddy Decl.), ¶¶210, 250. Specifically, Senoh explains that the copyright holder and content server computers could be the same machines, Ex. 1004 (Senoh), ¶[0032], that each copyright holder receives a unique ID, *id.*, ¶[0034], and that the relay server stores a catalog with content from multiple copyright holders, *id.*, ¶[0054], FIG. 5; Ex. 1002 (Reddy Decl.), ¶¶210, 250. Therefore, to implement a system where the content server maintains the previews until requested would have caused the content to be fetched when the catalog data was requested, sent to the relay server, transcoded at the relay server, and sent to the user terminal, from each of the content servers that provided catalog content. This would have added latency to the system, resulting in a potentially frustrating user experience that could lead to the perception that the service was poor quality. Ex. 1002 (Reddy Decl.), ¶¶210, 250. Therefore, transcoding the preview content in advance like Agraharam does would have been seen as a way to reduce latency for resource intensive audio and video content like Senoh's previews. *Id.* And, while users might be willing to wait for content to be transcoded after they pay for it and await its delivery, users may be less tolerant of delays while viewing a number of different previews in the catalog while browsing for something they may want to buy. *Id.* Thus, the POSITA would have been led to look to Kenner for a solution to the problem of ensuring content was delivered to devices in a format they could properly view. *Id.* Third, storing multiple implementations of an item of content (previews) is one of a finite number of predictable solutions available to the POSITA for enabling content to be tailored to the user terminals requesting Senoh's previews. Ex. 1002 (Reddy Decl.), ¶¶211, 250. Indeed, besides receiving and storing different implementations of items of content, one implementation could be received and transcoded at the relay server; implementations may be transcoded on the fly from a single implementation, or, contrary to Senoh's teachings, the catalog content could be kept at content servers and either transcoded there statically or

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	Claim	Prior Art Disclosures
		dynamically. *Id.* These solutions all had predictable results as the concepts of "static" transcoding and "dynamic" transcoding were discussed in the literature and had known implications. *See, e.g.*, Ex. 1008, pp.154-157. The POSITA would have seen that Li teaches a way of transcoding content into numerous different formats to create what Li calls "InfoPyramids." Ex. 1007 (Li), 2:40-47, 5:66-6:2 ("As shown in FIG 2, the content items 120 of a multimedia document 100 are transcoded (250) into multiple modality and fidelity versions to generate a set of InfoPyramids 280."); Ex. 1002 (Reddy Decl.), ¶¶192-195, 248. *FIG. 2*  Ex. 1007 (Li), FIG. 2. Therefore, Li teaches transcoding content items into ***a plurality of different implementations of at least one of the items of content, where each***

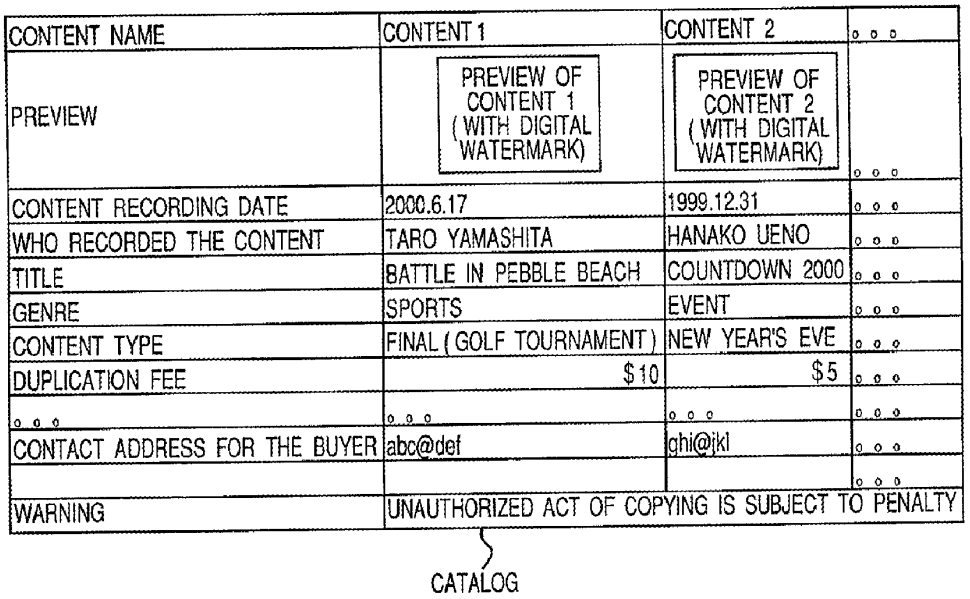
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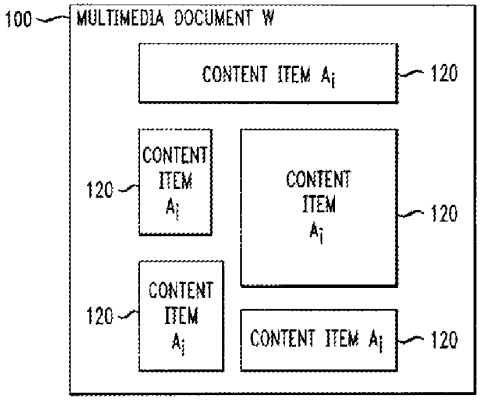
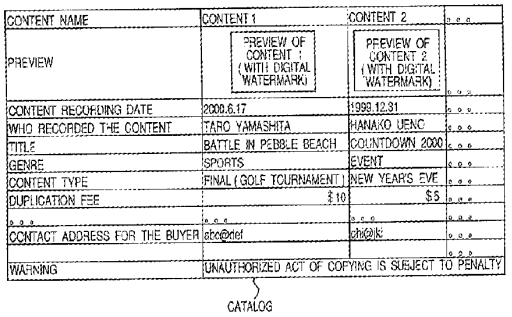
	Claim	Prior Art Disclosures
		implementation of any given item of content correspondents to a different set of device capabilities. Ex. 1002 (Reddy Decl.), ¶¶195, 248. As taught in Li, based on the client device capabilities and resources provided in a client device profile, an appropriate implementation of the item of content can be selected for the device, e.g., "all versions that are in video modality can be filtered out if the device is not capable of displaying video" and "all versions that are color images can be filtered out for a device that has only a black and white or gray-level screen." Ex. 1007 (Li), 6:52-56. The POSITA would have looked to Li to improve Senoh's catalog display techniques because Li provides a way to optimize the delivery of multimedia content to user devices. Ex. 1002 (Reddy Decl.), ¶¶197, 207, 248, 250. It would have been obvious to transcode preview content in Senoh's content servers to create InfoPyramids using techniques taught in Li so that InfoPyramids could be provided to relay servers to enable selection of the best way to present content to a particular user terminal based on a device's capabilities and resources as taught in Li to address the known problem that different devices had different display capabilities and not all content was properly formatted for all devices . Ex. 1002 (Reddy), ¶205, 212, 248, 250. A POSITA would have found the inclusion of Li's known technique would have improved Senoh's catalog system in the same way that improved Li's system for allowing various devices to view content tailored to the device. *Id.*, ¶212, 248, 250. And, applying the Li techniques to content for Senoh's catalog would allow for consumers of video content to browse the catalog for content using a variety of devices thus accomplishing the intended goal of Senoh's product catalog—i.e., "to market the content to a wider audience." Ex. 1004 (Senoh), ¶[0043]. Moreover, applying Li's technique for adapting content to a variety of user terminals including "PDAs" and "smart cellular phones," Ex. 1007 (Li), 1:31-36, would have merely applied Li's known technique for transcoding various types of content such as Senoh's text and video and audio clips into different fidelity and/or modalities to allow as many users to view the content as possible from their mobile devices, *id.*, 4:58-67; Ex. 1002 (Reddy Decl.), ¶¶214, 250. Applying Li to Senoh's catalog technique would have improved Senoh in the same way as it improved the prior art discussed in Li. Ex. (Reddy Decl.) 1002, ¶¶215, 250. At the very least, applying Li's techniques on the data to be served to the relay

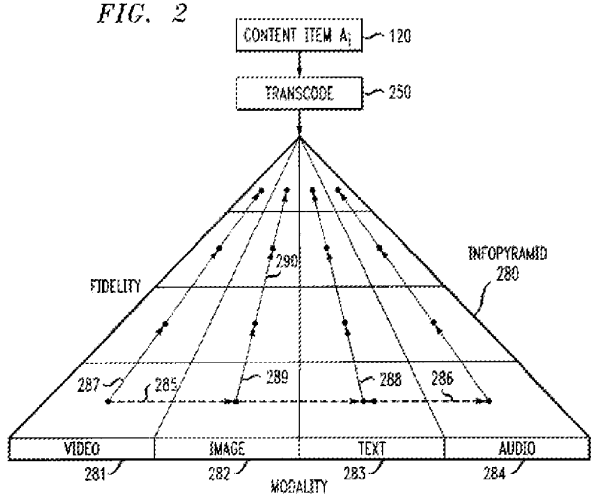
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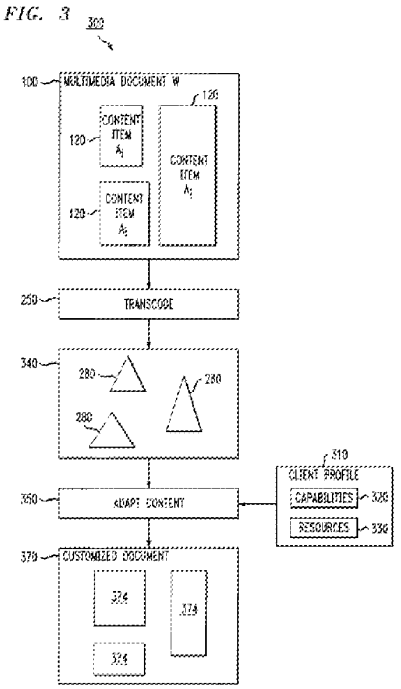
	Claim	Prior Art Disclosures
		server from Senoh's content servers for use in Senoh's catalogs would have improved upon Senoh in a predictable manner—by allowing catalog content to be tailored for many different types of devices so that the content could be marketed to wider audiences. Ex. 1002 (Reddy Decl.), ¶¶215, 250. The POSITA would have reasonably expected to succeed in combining Senoh and Li because Li's transcoding techniques were known and predictable and combining them with Senoh would have merely combined the known transcoding techniques with known and Internet-based technologies to provide Senoh's product catalog to user devices. Ex. 1002 (Reddy Decl.), ¶216, 250.
[8Biii]	maintain a product catalog containing a description of the items of content, the product catalog including, in association with each item of content, a reference to each implementation of said item of content.	Senoh teaches a download manager to ***maintain a product catalog containing a description of the items of content***. Senoh, however, does not explicitly teach that the product catalog includes ***in association with each item of content, a reference to each implementation of said item of content***. This latter aspect of the claim would have been obvious over Senoh in view of Li. Senoh explains that "content server 3 . . generates and sends catalog data for content to the relay server 2 in order to market the content to a wider audience." Ex. 1004 (Senoh), ¶[0043]. "[T]he relay server 2 is a server computer accessible from the network and storing a compiled catalog of plural catalog data entries." *Id.*, ¶[0044]. "A sample catalog compiling plural catalog data entries is shown in FIG. 4." *Id.*, ¶[0045].

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	Claim	Prior Art Disclosures
		Fig.4  CATALOG Ex. 1004 (Senoh), FIG. 4. Senoh does not explicitly teach that the product catalog ***includes, in association with each item of digital content, a reference to each implementation of said item of digital content***. But, this feature would have been obvious over the combined teachings of Senoh and Li. As explained in connection with *Limitation [1Aii]*, above, it would have been obvious to store multiple implementations (formats) of Senoh's catalog content at Senoh's relay server in data structures such as Li's InfoPyramids based on Li's teachings. In doing so, a POSITA would have understood that ***a reference to each implementation of said item of digital content*** was needed to identify the specific InfoPyramid for a specific item of information. More specifically, a POSITA would have understood that there needed to be a reference from the content items—e.g., Senoh's previews—and the InfoPyramid that defines various

	Claim	Prior Art Disclosures
		implementations of that content item stored at the relay server. Ex. 1002 (Reddy Decl.), ¶¶200-202, 249. Such a reference is needed to tie the items (previews) in the catalog to the InfoPyramid including the implementations and without such a reference the system would not be able to correlate items to InfoPyramids. *Id.*, ¶¶202, 249. As Li explains, a "multimedia document," includes "a number of content items Ai, denoted as reference numeral 120, where i=1, 2, . . . , n." Ex. 1007 (Li), 4:10-13. The POSITA would have observed that Li's multimedia documents would have provided a framework for representing Senoh's product catalog. Ex. 1002 (Reddy), ¶200, 249. This can be seen in the illustration below:  *Fig.4*  CONTENT NAME | CONTENT 1 | CONTENT 2 PREVIEW | PREVIEW OF CONTENT 1 (WITH DIGITAL WATERMARK) | PREVIEW OF CONTENT 2 (WITH DIGITAL WATERMARK) CONTENT RECORDING DATE | 2000.6.17 | 1999.12.31 WHO RECORDED THE CONTENT | TARO YAMASHITA | HANAKO UENO TITLE | BATTLE IN PEBBLE BEACH | COUNTDOWN 2000 GENRE | SPORTS | EVENT CONTENT TYPE | FINAL (GOLF TOURNAMENT) | NEW YEARS EVE DUPLICATION FEE | $10 | $5 CONTACT ADDRESS FOR THE BUYER | abc@def | ghi@jkl WARNING | UNAUTHORIZED ACT OF COPYING IS SUBJECT TO PENALTY CATALOG Ex. 1007 (Li), FIG. 1; Ex. 1004 (Senoh), FIG. 4. Here, different fields such as the preview of "Content 1" maybe one content item A_i and the preview of "Content 2" may be another item of content Ai in Li's FIG. 1. Ex. 1002 (Reddy Decl.), ¶202, 249. Additionally, the text information for a particular item of content may represent another content item Ai and so on. Ex. 1002 (Reddy Decl.), ¶¶199, 202, 249. According to Li's teachings, each item of content Ai is transcoded into a number of different representations and stored in the InfoPyramid data structure as illustrated below in FIG. 2:

	Claim	Prior Art Disclosures
		FIG. 2  Ex. 1007 (Li), FIG. 2. When a document (e.g., Senoh's product catalog) includes multiple items of information with multiple components, each of the items can be represented in its own InfoPyramid (280), as indicated in Li's FIG. 3:

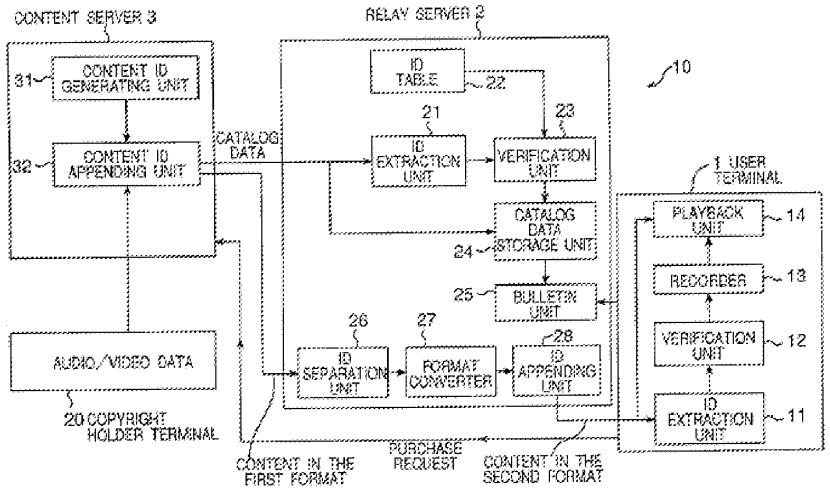
	Claim	Prior Art Disclosures
		FIG. 3  Ex. 1007 (Li), FIG. 3. Thus, a document such as Senoh's product catalog includes a number of content items (e.g., text, video previews) that each provide a ***product catalog*** which includes ***in association with each item of content*** (e.g., "Content 1's" preview) ***a reference to each implementation of said item of content***—i.e., a reference to the particular InfoPyramid that includes the "multiple representations of a multimedia item . . . organized into a pyramid-like data structure, as illustrated in FIG. 2." Ex. 1007 (Li), 4:58-61. These different implementations are further described by Li as follows: "The cells of the pyramid correspond to different representations of the objects using different modalities such as, for example, video 281, image 282, audio 283 and text 284, and fidelities such as in the range of full-resolution

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	Claim	Prior Art Disclosures
		(bottom of the pyramid) to low-resolution (top of the pyramid). A specific version of a multimedia item can be referred to by one of the cells." Ex. 1007 (Li), 4:61-67. The POSITA would have understood that in implementing Senoh's product catalog using Li's InfoPyramids, each item of information—e.g., preview of Content 1 or a preview of Content 2—would be associated with multiple implementations of that item as defined in the InfoPyramid and that the process of selecting which, if any, implementation is to be provided to the user terminal required use of a ***reference to*** the specific InfoPyramid—i.e., to ***each implementation of said item of content*** to allow selection of the appropriate item of content for the end user terminal. Ex. 1002 (Reddy Decl.), ¶¶202, 217, 249. It would have been obvious to use Li's InfoPyramid techniques to provide items of content and implementations of items of content to Senoh's relay server for the product catalog for the reasons discussed above in connection with *Limitation [8Bii]* and in doing so, the POSITA would have been led to link information items (e.g., content items) with InfoPyramids as taught by Li to enable the system to operate properly. Ex. 1002 (Reddy Decl.), ¶217, 249-250.
[9P]	A system comprising:	The preamble is not a limitation of the claim. However, even if the preamble is interpreted as being a limitation of the claim, Senoh discloses a system, such as the content distribution system shown in FIG. 2. *See, e.g.*, Ex. 1004 (Senoh), ¶¶[0002] ("This invention relates to controlling an electronic distribution system for distributing digital multimedia content, including audio and video, by way of a network."), [0010] ("An object of this invention is therefore to provide an electronic distribution system . . . ."), [0030] ("The configuration of this content distribution system is described in greater detail below with reference to FIG. 2.").

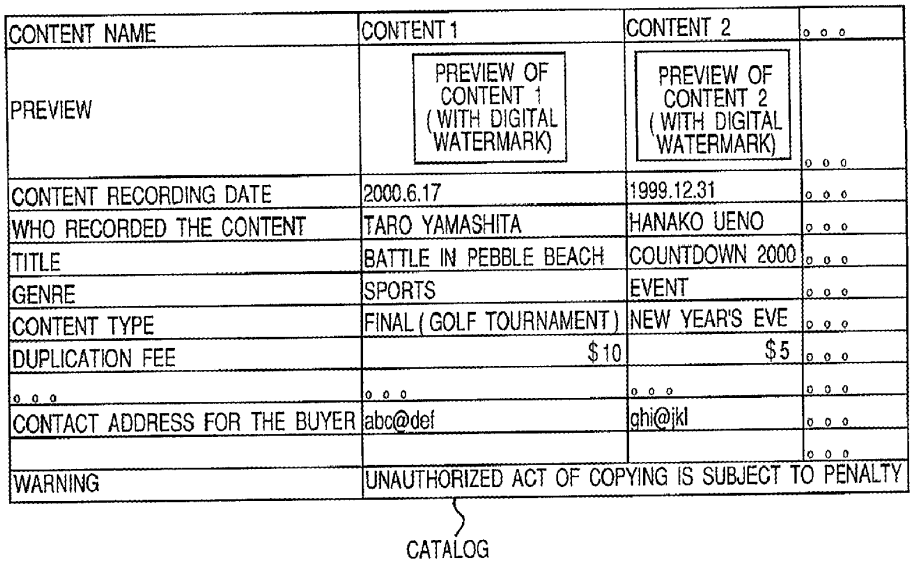
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	Claim	Prior Art Disclosures
		Fig.2  Ex. 1004 (Senoh), FIG. 2; *see also* Ex. 1002 (Reddy Decl.), ¶252.
[9A]	a processor; and	A POSITA would have understood that Senoh teaches ***a processor*** even though it is not explicitly mentioned. At the very least, the use of ***a processor*** in Senoh's system would have been obvious. For instance, Senoh teaches a "content distribution system 10" that includes a "user terminal 1," "relay server 2," and "content server 3." Ex. 1004 (Senoh), ¶[0029]. These entities are capable of communicating over a "communication network 4, such as the Internet . . . ." *Id.* Moreover, Senoh explains that various content may be converted from one format (e.g., MPEG-2) to another format (MPEG-4). *Id.*, ¶¶[0064], [0067]. Furthermore, Senoh explains that > The processing operations of the various components of the above described content distribution system can also be written as a computer program causing a computer to execute the various

	Claim	Prior Art Disclosures
		processes. Such a computer can be recorded to a CD, DVD, or other optical disc, to a floppy disk or other magnetic storage medium, or to flash memory or other semiconductor storage medium. The computer program could yet further be distributed as an electric signal via the Internet or other network. Ex. 1004 (Senoh), ¶[0081]. The POSITA would have understood all of these references to refer to systems with processors for executing computer-readable instructions. Ex. 1002 (Reddy Decl.), ¶253. Even if it could be argued that a processor is not disclosed to the POSITA, a POSITA would have understood how to implement the functionality described by Senoh and rendered obvious by Senoh in view of Li in a processor because processors were commonly used to execute computer-readable instructions in computer systems such as those described by Senoh. Ex. 1002 (Reddy Decl.), ¶253.
[9B]	a storage facility accessible to the processor and containing code which, when executed by the processor, causes the processing system to	Senoh discloses or at least renders obvious the claimed ***storage facility accessible to the processor and containing code which, when executed by the processor, causes the processing system to*** perform various functions. For instance, Senoh explains: The processing operations of the various components of the above described content distribution system can also be written as a computer program causing a computer to execute the various processes. Such a computer can be recorded to a CD, DVD, or other optical disc, to a floppy disk or other magnetic storage medium, or to flash memory or other semiconductor storage medium. The computer program could yet further be distributed as an electric signal via the Internet or other network. Ex. 1004 (Senoh), ¶¶255-256. The POSITA would have understood that the functionality performed by, for instance the content server and the relay server would have been implemented based on computer code,

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	Claim	Prior Art Disclosures
		and that such code would have been stored in a ***storage facility*** so that the computer-readable instructions could be fetched and executed by the processor to perform the functionality disclosed and rendered obvious by Senoh. Ex. 1002 (Reddy Decl.), ¶¶255-256.
[9Bi]	receive and store a plurality of items of digital content to be made available for use in wireless communication devices used by a plurality of wireless telecommunications subscribers,	Senoh discloses or at least renders obvious code that when executed causes the processing system to ***receive and store a plurality of items of digital content to be made available for use in wireless communication devices used by a plurality of wireless communication subscribers***. The functionality associated with ***receiving and storing*** are performed ***in a server system***—namely Senoh's relay server 2. Ex. 1002 (Reddy Decl.), ¶147, 257. Senoh discloses a catalog with multiple items of content as shown in Figure 4 (below). *Fig.4*  CONTENT NAME / CONTENT 1 / CONTENT 2 / ... PREVIEW / PREVIEW OF CONTENT 1 (WITH DIGITAL WATERMARK) / PREVIEW OF CONTENT 2 (WITH DIGITAL WATERMARK) CONTENT RECORDING DATE / 2000.6.17 / 1999.12.31 WHO RECORDED THE CONTENT / TARO YAMASHITA / HANAKO UENO TITLE / BATTLE IN PEBBLE BEACH / COUNTDOWN 2000 GENRE / SPORTS / EVENT CONTENT TYPE / FINAL (GOLF TOURNAMENT) / NEW YEAR'S EVE DUPLICATION FEE / $10 / $5 CONTACT ADDRESS FOR THE BUYER / abc@def / ghi@jkl WARNING / UNAUTHORIZED ACT OF COPYING IS SUBJECT TO PENALTY CATALOG

	Claim	Prior Art Disclosures
		Ex. 1004 (Senoh), FIG. 4. This figure shows "[a] sample catalog compiling plural catalog entries," from which users can "select desired content by accessing [a] bulletin board on the relay server 2 and viewing the catalog." *Id.*, ¶[0045]. The catalog data is generated by and sent from the content server 3 to the relay server 2. *See* Ex. 1004 (Senoh), ¶¶[0043] ("The content server 3 then generates and sends catalog data for the content to the relay server 2 in order to market the content to a wider audience."), [0044] ("[T]he relay server 2 is a server computer accessible from the network and storing a compiled catalog of plural catalog data entries."). This allows the relay server to store "a compiled catalog of plural catalog data entries." *Id.*, ¶[0044]. Content stored at relay server includes previews of audio or video data. "If the content contains video, the relay server 2 preferably enables the content highlights to be previewed. If the content is audio (music), a selection of a particular length could be provided as a preview." Ex. 1004 (Senoh), ¶[0044]; *see also id.*, FIG. 4. Here, a first item of content is "Preview of Content 1" and a second item of content is "Preview of Content 2" and thus are ***a plurality of items of content*** which are to be made available to user terminals including ***wireless communication devices used by a plurality of wireless services subscribers***. Ex. 1002 (Reddy Decl.), ¶¶76-77, 147, 257. These ***plurality of items of content*** are provided from Senoh's content server 3 and are ***received*** by, and ***stored*** in, the relay server. *See* Ex. 1004 (Senoh), ¶[0043] ("The content server 3 then generates and sends catalog data for the content to the relay server 2 in order to market the content to a wider audience. The catalog data could contain previews of content highlights . . . ."), ¶[0044] ("[T]he relay server 2 is a server computer accessible from the network and storing a compiled product catalog of plural catalog data entries."). These different previews associated with the difference catalog entries (e.g., as shown in FIG. 4) are ***received and stored in*** relay server and constitute ***items of digital content to be made available for use in wireless communication devices used by a plurality of wireless services subscribers***. Ex. 1002 (Reddy Decl.), ¶¶78 (citing Ex. 1011, 2:5-7 and explaining that wireless services for cellular phones were provided as a subscription service using, for example, Subscriber Identity Modules in cellular phones), 147, 257.
[9Bii]	including receiving and storing a plurality of different implementations of	This limitation would have been obvious over Senoh in view of Li. While Senoh describes how items of content (e.g., video and audio previews) are received and stored at the relay server, Senoh does not disclose a mechanism for ensuring that the content displays or is

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	Claim	Prior Art Disclosures
	at least one of the items of digital content, where each implementation of any given item of digital content corresponds to a different set of device capabilities;	otherwise reproduced in a manner that is appropriate for the specific user terminal capabilities based on the terminal that is requesting to view the content. Ex. 1002 (Reddy Decl.), ¶¶79, 258. In connection with the catalog previews, Senoh does not disclose ***receiving and storing a plurality of different implementations of at least one of the items of digital content, where each implementation of any given item of content corresponds to a different set of device capabilities*** to allow wider access to Senoh's catalog previews. A POSITA would have thus looked to a technique to ensure that the user terminals received previews in a format that could be viewed by the terminal. Ex. 1002 (Reddy Decl.), ¶¶191, 258. Li provides a technique that can accomplish this result and present content in the manner best suited for a particular user terminal. Specifically, Li teaches a method and apparatus for adapting multimedia content for diverse client devices including personal digital assistants (PDAs) and "smart cellular phones." Ex. 1007 (Li), 1:18-21, 1:31-36. The multimedia content is adapted "to optimally match the capabilities of the client device requesting it." *Id.*, 2:19-21. Each content item is "transcoded into multiple resolution and modality versions so that they can be rendered on different devices." *Id.*, 2:24-26. "For example, a video item is transcoded into a selected set of images so that it can be rendered on a device not capable of displaying video." *Id.* Li's invention "permits the transcoded versions of the content items to be generated prior to any requests. Thus, the invention can handle media items such as video and audio which are difficult to handle in conventional proxies. This off-line transcoding also leads to lower response latencies than proxies." Ex. 1007 (Li), 3:4-10. The content adaptation process "can be deployed on the server-side . . . ." *Id.*, 12:11-12. The specific item(s) of information to be served to the client device are determined based on the device capabilities. Ex. 1007 (Li), 6:3-9 ("A client device is characterized by its profile 310 which lists the capabilities 320 and resources 300 of the device. . . . A client may have a different number of capabilities 320 and resources 330."); *id.*, 6:42-47 ("A content adaptation process 350 uses the client profile 3109 to select from among the InfoPyramids 280 the versions 374 that best satisfy the particular client profile. These selected versions are rendered into a document 370 which is an adaptation (i.e., customization) of the original multimedia document 100."). A POSITA would have understood that while Senoh teaches a product catalog that includes information about multiple items of content including text and video clips that are provided

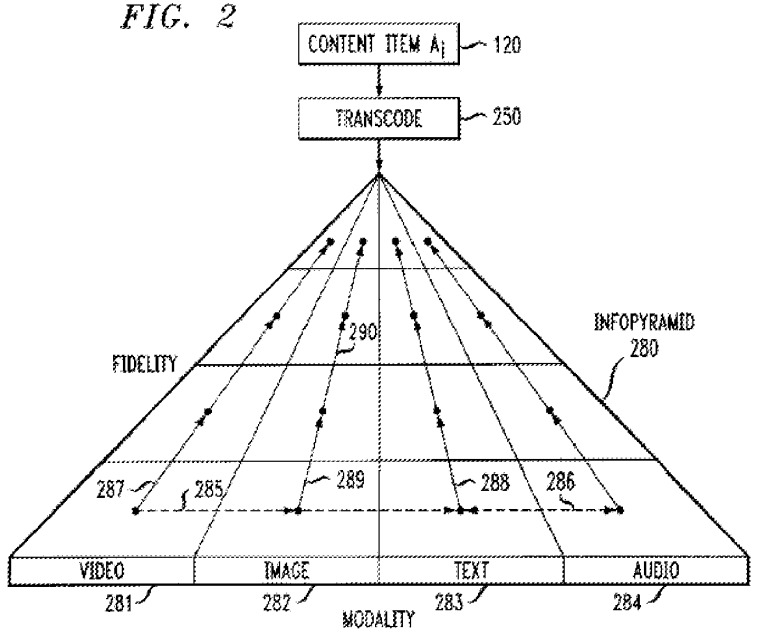
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	Claim	Prior Art Disclosures
		from content creators, *see* Ex. 1004 (Senoh), ¶¶[0043]-[0045], FIG. 4; Ex. 1002 (Reddy Decl., ¶¶190-191, 204, 258, 263, Senoh does not describe techniques for ensuring that the catalog can be accessed by devices with different device capabilities to ensure that the content provided from the catalog can be viewed on the client devices, *id.*. Therefore, the POSITA would have looked at prior art solutions to make the catalog as accessible to end-users as possible to achieve the goal of allowing the content to be marketed to "a wider audience" as taught by Senoh. Ex. 1004 (Senoh), ¶[0043]; Ex. 1002, ¶¶207, 258, 263. A POSITA would have found a solution in Li and would have been led to look to Li for such a solution for several reasons. First, a POSITA knew that content creators wanted to have control over how the different versions of their content displayed on devices. Ex. 1002 (Reddy Decl.), ¶¶209, 263; Ex. 1008 (Britton), p.156 ("The primary advantages of static transcoding are quality of presentation and performance.[] Each page is constructed by a human designer, generally working with tools that show how the application will look or sound and thus allowing the presentation to be hand-tailored for each environment."). To provide content creators the ability to control the appearance of different implementations of their content, the POSITA would have seen a benefit to having the content server maintain different, preformatted implementations of the previews, and provide those to Senoh's relay server to market the content to a wider audience. Ex. 1002 (Reddy Decl.), ¶¶209, 263; Ex. 1004 (Senoh), ¶[0044] (catalog for marketing to wider audience). Second, a POSITA knew that latency in viewing content on the Web affected the user experience. Ex. 1002 (Reddy Decl.), ¶¶210, 263. Thus, using the same transcoding processes that Senoh uses for purchased full-length content would have been unattractive for Senoh's previews. Ex. 1002 (Reddy Decl.), ¶¶210, 263. A POSITA would have understood from Senoh that content in the catalog originated from different content creators/copyright holders. Ex. 1002 (Reddy Decl.), ¶¶210, 263. Specifically, Senoh explains that the copyright holder and content server computers could be the same machines, Ex. 1004 (Senoh), ¶[0032], that each copyright holder receives a unique ID, *id.*, ¶[0034], and that the relay server stores a catalog with content from multiple copyright holders, *id.*, ¶[0054], FIG. 5; Ex. 1002 (Reddy Decl.), ¶¶210, 263. Therefore, to implement a system where the content server maintains the

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	Claim	Prior Art Disclosures
		previews until requested would have caused the content to be fetched when the catalog data was requested, sent to the relay server, transcoded at the relay server, and sent to the user terminal, from each of the content servers that provided catalog content. This would have added latency to the system, resulting in a potentially frustrating user experience that could lead to the perception that the service was poor quality. Ex. 1002 (Reddy Decl.), ¶¶210, 263. Therefore, transcoding the preview content in advance like Agraharam does would have been seen as a way to reduce latency for resource intensive audio and video content like Senoh's previews. *Id.* And, while users might be willing to wait for content to be transcoded after they pay for it and await its delivery, users may be less tolerant of delays while viewing a number of different previews in the catalog while browsing for something they may want to buy. *Id.* Thus, the POSITA would have been led to look to Kenner for a solution to the problem of ensuring content was delivered to devices in a format they could properly view. *Id.* Third, storing multiple implementations of an item of content (previews) is one of a finite number of predictable solutions available to the POSITA for enabling content to be tailored to the user terminals requesting Senoh's previews. Ex. 1002 (Reddy Decl.), ¶¶211, 263. Indeed, besides receiving and storing different implementations of items of content, one implementation could be received and transcoded at the relay server; implementations may be transcoded on the fly from a single implementation, or, contrary to Senoh's teachings, the catalog content could be kept at content servers and either transcoded there statically or dynamically. *Id.* These solutions all had predictable results as the concepts of "static" transcoding and "dynamic" transcoding were discussed in the literature and had known implications. *See, e.g.*, Ex. 1008, pp.154-157. The POSITA would have seen that Li teaches a way of transcoding content into numerous different formats to create what Li calls "InfoPyramids." Ex. 1007 (Li), 2:40-47, 5:66-6:2 ("As shown in FIG 2, the content items 120 of a multimedia document 100 are transcoded (250) into multiple modality and fidelity versions to generate a set of InfoPyramids 280."); Ex. 1002 (Reddy Decl), ¶¶192-195, 221, 258, 263.

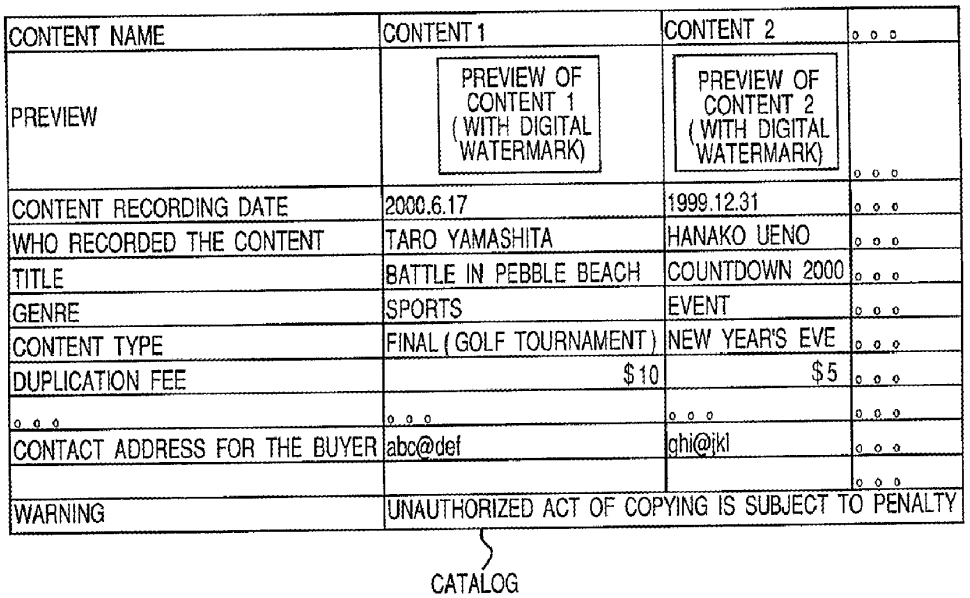
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	Claim	Prior Art Disclosures
		FIG. 2  Ex. 1007 (Li), FIG. 2. Therefore, Li teaches transcoding content items into ***a plurality of different implementations of at least one of the items of content, where each implementation of any given item of content correspondents to a different set of device capabilities***. Ex. 1002 (Reddy Decl.), ¶¶193, 221, 258. As taught in Li, based on the client device capabilities and resources provided in a client device profile, an appropriate implementation of the item of content can be selected for the device, e.g., "all versions that are in video modality can be filtered out if the device is not capable of displaying video" and "all versions that are color images can be filtered out for a device that has only a black and white or gray-level screen." Ex. 1007 (Li), 6:52-56. The POSITA would have looked to Li to improve Senoh's catalog display techniques because Li provides a way to optimize the delivery of multimedia content to user devices. Ex. 1002 (Reddy Decl.), ¶¶197, 207, 258, 263.

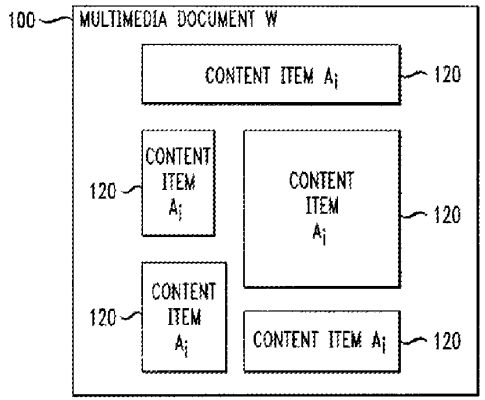
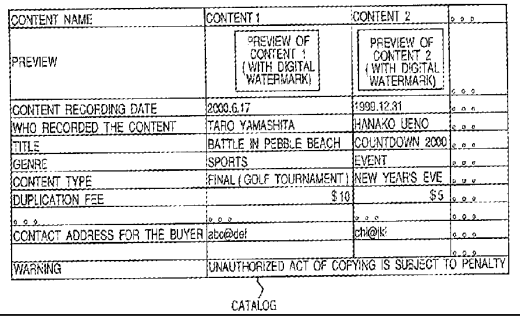
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	Claim	Prior Art Disclosures
		It would have been obvious to transcode content in Senoh's content servers to create InfoPyramids using techniques taught in Li so that InfoPyramids could be provided to relay servers to enable selection of the best way to present content to a particular user terminal based on a device's capabilities and resources as taught in Li to address the known problem that different devices had different display capabilities and not all content was properly formatted for all devices. Ex. 1002 (Reddy), ¶205, 263. A POSITA would have found the inclusion of Li's known technique would have improved Senoh's catalog system in the same way that improved Li's system for allowing various devices to view content tailored to the device. *Id.*, ¶212, 263. And, applying the Li techniques to content for Senoh's catalog would allow for consumers of video content to browse the catalog for content using a variety of devices thus accomplishing the intended goal of Senoh's product catalog—i.e., "to market the content to a wider audience." Ex. 1004 (Senoh), ¶[0043]. Moreover, applying Li's technique for adapting content to a variety of user terminals including "PDAs" and "smart cellular phones," Ex. 1007 (Li), 1:31-36, would have merely applied Li's known technique for transcoding various types of content such as Senoh's text and video and audio clips into different fidelity and/or modalities to allow as many users to view the content as possible from their mobile devices, *id.*, 4:58-67; Ex. 1002 (Reddy Decl.), ¶214, 263. Applying Li to Senoh's catalog technique would have improved Senoh in the same way as it improved Li. Ex. (Reddy Decl.) 1002, ¶¶215, 263. At the very least, applying Li's techniques on the data to be served to the relay server from Senoh's content servers for use in Senoh's catalogs would have improved upon Senoh in a predictable manner—by allowing catalog content to be tailored for many different types of devices so that the content could be marketed to wider audiences. Ex. 1002 (Reddy Decl.), ¶¶215, 263. The POSITA would have reasonably expected to succeed in combining Senoh and Li because Li's transcoding techniques were known and predictable and combining them with Senoh would have merely combined the known transcoding techniques with known and Internet-based technologies to provide Senoh's product catalog to user devices. Ex. 1002 (Reddy Decl.), ¶¶216, 263.
[9Biii]	maintain a product catalog containing a description of	Senoh discloses and renders obvious code that when executed causes a processor to ***maintain a product catalog containing a description of items of digital content***. Senoh in view of

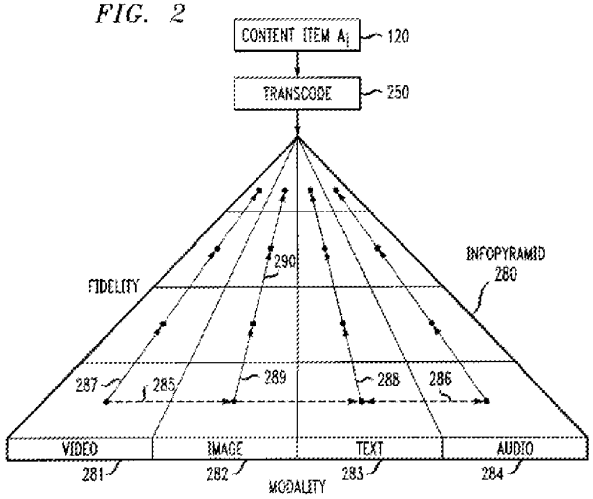
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	Claim	Prior Art Disclosures
	the items of digital content, wherein the product catalog includes, in association with each item of digital content, a reference to each implementation of said item of digital content;	Kenner renders obvious code that when executes causes a processor to maintain a product catalog ***wherein the product catalog includes, in association with each item of digital content, a reference to each implementation of said item of digital content***. Senoh explains that "content server 3 . . generates and sends catalog data for content to the relay server 2 in order to market the content to a wider audience." Ex. 1004 (Senoh), ¶[0043]. "[T]he relay server 2 is a server computer accessible from the network and storing a compiled catalog of plural catalog data entries." *Id.*, ¶[0044]. "A sample catalog compiling plural catalog data entries is shown in FIG. 4." *Id.*, ¶[0045]. *Fig.4*  Ex. 1004 (Senoh), FIG. 4.

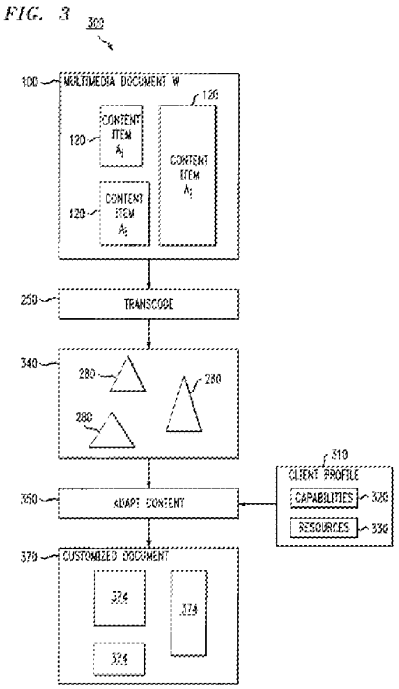
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	Claim	Prior Art Disclosures
		Senoh does not explicitly teach that the product catalog ***includes, in association with each item of digital content, a reference to each implementation of said item of digital content***. But, this feature would have been obvious over the combined teachings of Senoh and Li. As explained in connection with *Limitation [1Aii]*, above, it would have been obvious to store multiple implementations (formats) of Senoh's catalog content at Senoh's relay server in data structures such as Li's InfoPyramids based on Li's teachings. In doing so, a POSITA would have understood that ***a reference to each implementation of said item of digital content*** was needed to identify the specific InfoPyramid for a specific item of information. More specifically, a POSITA would have understood that there needed to be a reference from the content items—e.g., Senoh's previews—and the InfoPyramid that defines various implementations of that content item stored at the relay server. Ex. 1002 (Reddy Decl.), ¶¶200-202, 259. Such a reference is needed to tie the items (previews) in the catalog to the InfoPyramid including the implementations and without such a reference the system would not be able to correlate items to InfoPyramids. Ex. 1002 (Reddy Decl.), ¶¶202, 259. As Li explains, a "multimedia document," includes "a number of content items Ai, denoted as reference numeral 120, where i=1, 2, . . . , n." Ex. 1007 (Li), 4:10-13. The POSITA would have observed that Li's multimedia documents are a generic way to represent Senoh's product catalog. Ex. 1002 (Reddy), ¶¶200, 259. This can be seen in the illustration below:  *Fig.4* 

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	Claim	Prior Art Disclosures
		Ex. 1007 (Li), FIG. 1; Ex. 1004 (Senoh), FIG. 4. Here, different fields such as the preview of "Content 1" maybe one content item A_i and the preview of "Content 2" may be another item of content Ai in Li's FIG. 1. Ex. 1002 (Reddy Decl.), ¶¶202, 259. Additionally, the text information for a particular item of content may represent another content item Ai and so on. Ex. 1002 (Reddy Decl.), ¶199, 202, 259. According to Li's teachings, each item of content Ai is transcoded into a number of different representations and stored in the InfoPyramid data structure as illustrated below in FIG. 2: *FIG. 2*  Ex. 1007 (Li), FIG. 2. When a document (e.g., Senoh's product catalog) includes multiple items of information with multiple components, each of the items can be represented in its own InfoPyramid (280), as indicated in Li's FIG. 3:

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	Claim	Prior Art Disclosures
		FIG. 3  Ex. 1007 (Li), FIG. 3. Thus, a document such as Senoh's product catalog includes a number of content items (e.g., text, video previews) that each provide a ***product catalog*** which includes ***in association with each item of content*** (e.g., "Content 1's" preview) ***a reference to each implementation of said item of content***—i.e., a reference to the particular InfoPyramid that includes the "multiple representations of a multimedia item . . . organized into a pyramid-like data structure, as illustrated in FIG. 2." Ex. 1007 (Li), 4:58-61. These different implementations are further described by Li as follows: "The cells of the pyramid correspond to different representations of the objects using different modalities such as, for example, video 281, image 282, audio 283 and text 284, and fidelities such as in the range of full-resolution

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	Claim	Prior Art Disclosures
		(bottom of the pyramid) to low-resolution (top of the pyramid). A specific version of a multimedia item can be referred to by one of the cells." Ex. 1007 (Li), 4:61-67. The POSITA would have understood that in implementing Senoh's product catalog using Li's InfoPyramids, each item of information—e.g., preview of Content 1 or a preview of Content 2—would be associated with multiple implementations of that item as defined in the InfoPyramid and that the process of selecting which, if any, implementation is to be provided to the user terminal required use of a ***reference to*** the specific InfoPyramid—i.e., to ***each implementation of said item of content*** to allow selection of the appropriate item of content for the end user terminal. Ex. 1002 (Reddy Decl.), ¶202, 217, 259. It would have been obvious to use Li's InfoPyramid techniques to provide items of content and implementations of items of content to Senoh's relay server for the product catalog for the reasons discussed above in connection with *Limitation [9Bii]* and in doing so, the POSITA would have been led to link information items (e.g., content items) with InfoPyramids as taught by Li to enable the system to operate properly. Ex. 1002 (Reddy Decl.), ¶¶217, 259.
[9Biv]	receive a request from a wireless device used by one of the subscribers;	Senoh in view of Kenner renders obvious code that when executed causes a processor to ***receive a request from a wireless device used by one of the subscribers***. Senoh teaches that a user accesses a catalog including "plurality catalog data entries." Ex. 1004 (Senoh), ¶[0045]. This catalog is stored on the relay server. Ex. 1004 (Senoh), ¶¶[0043]-[0044]. The catalog "can be posted to a common bulletin board (electronic bulletin board) accessible from the network," which allows "users to "select desired content by accessing the bulletin board on the relay server 2 and viewing the catalog." *Id.*, ¶[0045]. A POSITA would have understood that in order to view content stored at the relay server, the client device—i.e., the claimed ***wireless device*** would need to request that information and that the request would need to be received by the relay server. Ex. 1002 (Reddy Decl.), ¶¶224-226, 260. Based on this request, the catalog data from the electronic bulletin board would be provided to the client device according to the teachings of Senoh. Li also describes receiving a request from a client device for content stored on a server. As Li explains, "[a]s is well known, a Web user (client) makes a request from his client device

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	Claim	Prior Art Disclosures
		for some particular Web document(s) or other multimedia content which may contain video, images, graphics, text, audio. The request is sent to a Web server which satisfies the request by returning the requested document to the client." Ex. 1007 (Li), 4:5-10. A POSITA would have understood that the request discussed by Li would have been used in the context of Senoh to request the product catalog from the relay server. Ex. 1002 (Reddy Decl.), ¶¶226, 260. Therefore, both Senoh and Li teach a step of ***receiving a request from a wireless device used by one of the subscribers*** and it would have been obvious to use such a request to receive product catalog data in connection with a combined system according to Senoh and Li.
[9Bv]	in response to the request, select a portion of the product catalog to be presented to the subscriber, based on device capabilities of the wireless device used by the subscriber; and	Senoh in view of Kenner renders obvious code that when executed causes a processor to ***in response to the request, selecting a portion of the product catalog to be presented to the subscriber, based on the capabilities of the wireless device used by the subscriber.*** As explained above in connection with *Limitation [9Bii]*, it would have been obvious to use the Li techniques in combination with Senoh's product catalog to ensure that properly formatted video and audio data are served from Senoh's relay server to user terminals viewing the product catalog previews. In the combined system, a request is made from a client device/user terminal to view the product catalog. According to Li's teachings, the product capabilities can be provided to the server in various ways: > The client device profile can be obtained by a number of mechanisms. For example, the User-Agent fields in the HTTP (hyper text transport protocol) request header contain information about the browser and often the operating system. Also, Windows-CE devices specify the screen size, color depth and processor. Ex. 1007 (Li), 6:30-35. Li also explains that information that cannot be viewed on the client is excluded from being served to the client. For example, Li explains "the versions from the InfoPyramids that do not meet client capabilities 320 are filtered out. For example, all versions that are in video

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	Claim	Prior Art Disclosures
		modality can be filtered out if the device is not capable of displaying video. Similarly, all versions that are color images can be filtered out for a device that has only a black and white or gray-level screen." Ex. 1007 (Li), 6:49-56; *see also id.*, 10:62-65 ("Before we start the resource allocation process, we remove from consideration all the versions of items that a client is not capable of handling."). Then, the appropriate version of the content to send in response to the request is chosen from the versions that are not filtered out. *Id.*, 6:64-67 ("Then, in step 470, the resources allocated for each InfoPyramid are used to select the appropriate version 374, which has not been previously filtered out in step 420, to render the customized multimedia document 370."). In this way, a ***portion of the product catalog*** is selected ***based on the device capabilities of the wireless device used by the subscriber.*** Thus, in the combined Senoh-Li system, in response to the request—i.e., request for the product catalog from a client device—a portion of the product catalog is selected from the relay server to be presented to the subscriber on their terminal. There are two phases to the selection of the portion of the product catalog to convey for each item of information—including video preview: (1) filtering out content that cannot be displayed by the client device, and (2) identifying the correct item from the InfoPyramids that have not been filtered out based on the resource allocation process. These processes are performed ***based on the device capabilities of the wireless device used by the subscriber*** provided from the client device as described above. *See also* Ex. 1007 (Li), 6:42-44 ("The content adaptation process 350 uses the client profile 310 to select from among the InfoPyramids 280 the versions 374 that best satisfy the particular client profile."); Ex. 1002 (Reddy Decl.), ¶¶229-230, 261. And, only ***a portion of the product catalog*** is selected because the preview content is only provided in one format (if at all)—and content that is not supported or not deemed optimal for a particular device according to the received profile, are not presented to the subscriber. Ex. 1002 (Reddy Decl.), ¶¶229-230, 261.
[9Bvi]	cause the selected portion of the product catalog to be presented to the subscriber via a wireless telecommunications network, such that the	Senoh in view of Li renders obvious code that when executed, ***causes the selected portion of the product catalog to be presented to the subscriber via a wireless network, such that the selected portion, as presented to the subscriber, provides only a single description of each item of digital content in said portion, regardless of the number of implementations of each said item***.

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	Claim	Prior Art Disclosures
	selected portion, as presented to the subscriber, provides only a single description of each item of digital content in said portion, regardless of the number of implementations of each said item.	A subscriber using the cellular phone described by Senoh to view the product catalog including video previews, Ex. 1004, ¶¶[0044], [0060], [0074], in which the techniques of Li are used to select a preview in the appropriate format for viewing on the user terminal would be presented with ***the selected portion of the product catalog via a wireless network***. Ex. 1002 (Reddy Decl.), ¶¶232-233, 262; Ex. 1004 (Senoh), ¶[0045] ("The catalog can be posted to a common bulletin board (electronic bulletin board) accessible from the network."); Ex. 1007 (Li), 4:8-10 ("The request is sent to a Web server which satisfies the request by returning the requested document to the client."). A POSITA would have understood that the product catalog from Senoh would have been presented to a subscriber using a mobile device via a wireless network because web-accessible pages such as Senoh's bulletin board were presented in response to requests made from clients over a network. Ex. 1002 (Reddy Decl.), ¶¶232-233, 262. Based on the combined teachings of Senoh and Li, the ***selected portion, as presented to the subscriber, provides only a single description of each item of digital content in said portion, regardless of the number of implementations***. This is because Senoh's catalog would have been presented in an optimal format for the particular end-user device as selected from the Li InfoPyramids. Ex. 1007, 6:49-67 (explaining that "versions from the InfoPyramids 280 that do not meet client capabilities 320 are filtered out" and "resources allocated for each InfoPyramid are used to select the appropriate version 347, which has not been previously filtered out in step 420, to render the customized multimedia document 370"). Thus, the customized multimedia document, such as Senoh's product catalog will only include a ***portion of the product catalog, which provides only a single description of each item of digital content regardless of how many implementations of each item of information.*** Ex. 1002 (Reddy Decl.), ¶233, 262. For instance, while Li's InfoPyramids may include several different implementations of a particular preview of a video in Senoh's catalog, only one description of the item including preview and any associated text is ultimately provided to the subscriber. *Id.*

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Patent Assignment Abstract of Title

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Application #: 10600746 **Filing Dt:** 06/19/2003 **Patent #:** 7233790 **Issue Dt:** 06/19/2007

PCT #: NONE **Intl Reg #:** **Publication #:** US20040054786 **Pub Dt:** 03/18/2004

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Title: DEVICE CAPABILITY BASED DISCOVERY, PACKAGING AND PROVISIONING OF CONTENT FOR WIRELESS MOBILE DEVICES

Assignment: 1

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Conveyance: ASSIGNMENT OF ASSIGNORS INTEREST (SEE DOCUMENT FOR DETAILS).

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Reel/Frame: 030585 / 0969 **Received:** 06/04/2013 **Recorded:** 05/08/2013 **Mailed:** 06/12/2013 **Pages:** 6

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Reel/Frame: 054727 / 0726 **Received:** 12/22/2020 **Recorded:** 12/22/2020 **Mailed:** 12/28/2020 **Pages:** 4

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Web interface last modified: Jun 26, 2017 v.2.6

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REEXAM CONTROL NUMBER	FILING OR 371 (c) DATE	PATENT NUMBER
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CONFIRMATION NO. 8395

REEXAM ASSIGNMENT NOTICE

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Date Mailed: 06/27/2022

NOTICE OF ASSIGNMENT OF REEXAMINATION REQUEST

The above-identified request for reexamination has been assigned to Art Unit 3993. All future correspondence to the proceeding should be identified by the control number listed above and directed to the assigned Art Unit.

A copy of this Notice is being sent to the latest attorney or agent of record in the patent file or to all owners of record. (See 37 CFR 1.33(c)). If the addressee is not, or does not represent, the current owner, he or she is required to forward all communications regarding this proceeding to the current owner(s). An attorney or agent receiving this communication who does not represent the current owner(s) may wish to seek to withdraw pursuant to 37 CFR 1.36 in order to avoid receiving future communications. If the address of the current owner(s) is unknown, this communication should be returned within the request to withdraw pursuant to Section 1.36.

NOTICE OF USPTO EX PARTE REEXAMINATION PATENT OWNER STATEMENT WAIVER PROGRAM

The USPTO has implemented a pilot program where, after a reexamination proceeding has been granted a filing date and before the examiner begins his or her review, the patent owner may orally waive the right to file a patent owner's statement. See *"Pilot Program for Waiver of Patent Owner's Statement in Ex Parte Reexamination Proceedings,"* 75 FR 47269 (August 5, 2010). One goal of the pilot program is to reduce the pendency of reexamination proceedings and improve the efficiency of the reexamination process.

Ordinarily when ex parte reexamination is ordered, the USPTO must wait until after the receipt of the patent owner's statement and the third party requester's reply, or after the expiration of the time period for filing the statement and reply (a period that can be as long as 5 to 6 months), before mailing a first determination of patentability. The USPTO's first determination of patentability is usually a first Office action on the merits or a Notice of Intent to Issue Reexamination Certificate (NIRC).

Under the pilot program, the patent owner's oral waiver allows the USPTO to act on the first determination of patentability immediately after determining that reexamination will be ordered, and in a suitable case issue the reexamination order and the first determination of patentability (which could be a NIRC if the claims under reexamination are confirmed) at the same time.

Benefits to the Patent Owner for participating in this pilot program include reduction in pendency.

To participate in this pilot program, Patent Owners may contact the USPTO's Central Reexamination Unit (CRU) at 571-272-7705. The USPTO will make the oral waiver of record in the reexamination file in an interview summary and a copy will be mailed to the patent owner and any third party requester.

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REEXAMINATION REQUEST NOTICE

OC000000134757698

Date Mailed: 06/27/2022

NOTICE OF REEXAMINATION REQUEST FILING DATE

(Third Party Requester)

Requester is hereby notified that the filing date of the request for reexamination is 06/23/2022, the date that the filing requirements of 37 CFR § 1.510 were received.

A decision on the request for reexamination will be mailed within three months from the filing date of the request for reexamination. (See 37 CFR 1.515(a)).

A copy of the Notice is being sent to the person identified by the requester as the patent owner. Further patent owner correspondence will be the latest attorney or agent of record in the patent file. (See 37 CFR 1.33). Any paper filed should include a reference to the present request for reexamination (by Reexamination Control Number).

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**** CONTINUING DATA ***************************

This application is a REX of 10/600,746 06/19/2003 PAT 7233790 *
which claims benefit of 60/393,024 06/28/2002
and claims benefit of 60/392,383 06/28/2002
and claims benefit of 60/393,041 06/28/2002
and claims benefit of 60/392,999 06/28/2002
(*)Data provided by applicant is not consistent with PTO records.

**** FOREIGN APPLICATIONS ***************************

**** IF REQUIRED, FOREIGN FILING LICENSE GRANTED ****

Foreign Priority claimed ❑ Yes ❑ No 35 USC 119(a-d) conditions met ❑ Yes ❑ No Verified and Acknowledged _____ Examiner's Signature	❑ Met after Allowance _____ Initials	STATE OR COUNTRY	SHEETS DRAWINGS	TOTAL CLAIMS	INDEPENDENT CLAIMS
				14	4

ADDRESS

Kilpatrick Townsend & Stockton LLP (I)
Mailstop: IP Docketing - 22
1100 Peachtree Street
Suite 2800
Atlanta, GA 30309
UNITED STATES

TITLE

DEVICE CAPABILITY BASED DISCOVERY PACKAGING AND PROVISIONING OF CONTENT FOR WIRELESS MOBILE DEVICES

FILING FEE RECEIVED		
12600	FEES: Authority has been given in Paper No._____ to charge/credit DEPOSIT ACCOUNT No._____ for following:	❑ All Fees ❑ 1.16 Fees (Filing) ❑ 1.17 Fees (Processing Ext. of time) ❑ 1.18 Fees (Issue) ❑ Other _____ ❑ Credit

BIB (Rev. 05/07).

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
90/015,063	06/23/2022	7233790	185945.011700	8395

46670 7590 07/18/2022

Kilpatrick Townsend & Stockton LLP (I)
Mailstop: IP Docketing - 22
1100 Peachtree Street
Suite 2800
Atlanta, GA 30309

EXAMINER	
HENEGHAN, MATTHEW E	

ART UNIT	PAPER NUMBER
3992	

MAIL DATE	DELIVERY MODE
07/18/2022	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

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500 CAMPUS DRIVE, SUITE 400
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FLORHAM PARK, NJ 07932

EX PARTE REEXAMINATION COMMUNICATION TRANSMITTAL FORM

REEXAMINATION CONTROL NO. *90/015,063* .

PATENT UNDER REEXAMINATION *7,233,790* .

ART UNIT *3992* .

Enclosed is a copy of the latest communication from the United States Patent and Trademark Office in the above identified *ex parte* reexamination proceeding (37 CFR 1.550(f)).

Where this copy is supplied after the reply by requester, 37 CFR 1.535, or the time for filing a reply has passed, no submission on behalf of the *ex parte* reexamination requester will be acknowledged or considered (37 CFR 1.550(g)).

PTOL-465 (Rev.07-04)

Ex Parte Reexamination Interview Summary – Pilot Program for Waiver of Patent Owner's Statement	**Control No.** 90/015,063	**Patent Under Reexamination is Requested** 7,233,790	
	Examiner Heneghan, Matthew	**Art Unit** 3992	**AIA (FITF) Status** No

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

All participants (USPTO official and patent owner):

(1) Kilpatrick Townsend & St... (3) _____

(2) Renee Preston CRU Paralegal (4) _____

Date of Telephonic Interview: 12 July 2022.

A. The USPTO official requested waiver of the patent owner's statement pursuant to the pilot program for waiver of patent owner's statement in *ex parte* reexamination proceedings.*

☐ The patent owner **agreed** to waive its right to file a patent owner's statement under 35 U.S.C. 304 in the event reexamination is ordered for the above-identified patent.

☐ The patent owner **did not agree** to waive its right to file a patent owner's statement under 35 U.S.C. 304 at this time.

☑ USPTO personnel were unable to reach the patent owner.**

B. The Patent Owner of record telephoned the Office and indicated they would like to participate in the pilot program for waiver of patent owner's statement in *ex parte* reexamination proceedings.*

☐ The Patent owner of record telephoned the Office and **agreed** to waive its right to file a patent owner's statement under 35 U.S.C. 304 in the event reexamination is ordered for the above-identified patent.

The patent owner is not required to file a written statement of this telephone communication under 37 CFR 1.560(b) or otherwise. However, any disagreement as to this interview summary must be brought to the immediate attention of the USPTO, and no later than one month from the mailing date of this interview summary. Extensions of time are governed by 37 CFR 1.550(c).

*For more information regarding this pilot program, see *Pilot Program for Waiver of Patent Owner's Statement in Ex Parte Reexamination Proceedings, 75 Fed. Reg.* 47269 (August 5, 2010), available on the USPTO Web site at http://www.uspto.gov/patents/law/notices/2010.jsp.

**The patent owner may contact the USPTO personnel at (571) 272-7705 or at the telephone number provided below if the patent owner decides to waive the right to file a patent owner's statement under 35 U.S.C. 304.

/RENEE M PRESTON/
Primary Examiner, OCRU (571) 272-1607
Signature and telephone number of the USPTO official, who contacted, was contacted by, or attempted to contact the patent owner.

cc: Requester (if third party requester)

Doc Code: PA..
Document Description: Power of Attorney

PTO/AIA/82A (07-13)
Approved for use through 03/31/2021. OMB 0651-0035
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TRANSMITTAL FOR POWER OF ATTORNEY TO ONE OR MORE REGISTERED PRACTITIONERS

NOTE: This form is to be submitted with the Power of Attorney by Applicant form (PTO/AIA/82B) to identify the application to which the Power of Attorney is directed, in accordance with 37 CFR 1.5, unless the application number and filing date are identified in the Power of Attorney by Applicant form. If neither form PTO/AIA/82A nor form PTO/AIA82B identifies the application to which the Power of Attorney is directed, the Power of Attorney will not be recognized in the application.

Application Number	90/015,063
Filing Date	June 23, 2022
First Named Inventor	7233790 Rikard M. Kjellberg
Title	DEVICE CAPABILITY BASED DISCOVERY PACKAGING AND PROVISIONING OF CONTENT FOR WIRELESS MOBILE DEVICES
Art Unit	3992
Examiner Name	Matthew E. Heneghan
Attorney Docket Number	22104.12

SIGNATURE of Applicant or Patent Practitioner

Signature	/Levi S. Brown/	Date (Optional)	
Name	Levi S. Brown	Registration Number	72533
Title (if Applicant is a juristic entity)	Attorney for Applicant		
Applicant Name (if Applicant is a juristic entity)	VIDEOLABS, INC.		

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) for signature requirements and certifications. If more than one applicant, use multiple forms.

☐ *Total of _____ forms are submitted.

This collection of information is required by 37 CFR 1.131, 1.32, and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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

Doc Code: PA..
Document Description: Power of Attorney

PTO/AIA/82B (07-13)
Approved for use through 03/31/2021. OMB 0651-0035
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number

POWER OF ATTORNEY BY APPLICANT

I hereby revoke all previous powers of attorney given in the application identified in either the attached transmittal letter or the boxes below.

Application Number	Filing Date

(Note: The boxes above may be left blank if information is provided on form PTO/AIA/82A.)

☑ I hereby appoint the Patent Practitioner(s) associated with the following Customer Number as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above: 22913

OR

☐ I hereby appoint Practitioner(s) named in the attached list (form PTO/AIA/82C) as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the patent application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above. (Note: Complete form PTO/AIA/82C.)

Please recognize or change the correspondence address for the application identified in the attached transmittal letter or the boxes above to:

☑ The address associated with the above-mentioned Customer Number

OR

☐ The address associated with Customer Number:

OR

☐ Firm or Individual Name					
Address					
City		State		Zip	
Country					
Telephone		Email			

I am the Applicant (if the Applicant is a juristic entity, list the Applicant name in the box):

VideoLabs, Inc.

☐ Inventor or Joint Inventor (title not required below)

☐ Legal Representative of a Deceased or Legally Incapacitated Inventor (title not required below)

☑ Assignee or Person to Whom the Inventor is Under an Obligation to Assign (provide signer's title if applicant is a juristic entity)

☐ Person Who Otherwise Shows Sufficient Proprietary Interest (e.g., a petition under 37 CFR 1.46(b)(2) was granted in the application or is concurrently being filed with this document) (provide signer's title if applicant is a juristic entity)

SIGNATURE of Applicant for Patent

The undersigned (whose title is supplied below) is authorized to act on behalf of the applicant (e.g., where the applicant is a juristic entity).

Signature		Date (Optional)	11/16/21
Name	Bill Goldman		
Title	SVP & Chief IP Officer		

NOTE: Signature - This form must be signed by the applicant in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. If more than one applicant, use multiple forms.

☐ Total of forms are submitted.

This collection of information is required by 37 CFR 1.131, 1.32, and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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

Electronic Acknowledgement Receipt

EFS ID:	46303157
Application Number:	90015063
International Application Number:	
Confirmation Number:	8395
Title of Invention:	DEVICE CAPABILITY BASED DISCOVERY PACKAGING AND PROVISIONING OF CONTENT FOR WIRELESS MOBILE DEVICES
First Named Inventor/Applicant Name:	7233790
Customer Number:	46670
Filer:	Levi S. Brown/JENNIFER ESCAMILLA
Filer Authorized By:	Levi S. Brown
Attorney Docket Number:	185945.011700
Receipt Date:	29-JUL-2022
Filing Date:	23-JUN-2022
Time Stamp:	13:07:03
Application Type:	Reexam (Patent Owner)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Power of Attorney	22104-12-2022-07-29-POA.pdf	1254403 280a02b5771bc48a89a62603bea14e2c6fd88dc4	no	2

Warnings:

Information:	
Total Files Size (in bytes):	1254403

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

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United States Patent and Trademark Office
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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
90/015,063	06/23/2022	7233790	185945.011700

CONFIRMATION NO. 8395

22913
Workman Nydegger
60 East South Temple
Suite 1000
Salt Lake City, UT 84111

POA ACCEPTANCE LETTER

OC000000135585876

Date Mailed: 08/03/2022

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 07/29/2022.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at **(571) 272-4000** or **(571) 272-4200** or **1-888-786-0101**.

/pflewis/

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United States Patent and Trademark Office
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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
90/015,063	06/23/2022	7233790	185945.011700

CONFIRMATION NO. 8395

POWER OF ATTORNEY NOTICE

46670
Kilpatrick Townsend & Stockton LLP (I)
Mailstop: IP Docketing - 22
1100 Peachtree Street
Suite 2800
Atlanta, GA 30309

OC000000135585868

Date Mailed: 08/03/2022

NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 07/29/2022.

- The Power of Attorney to you in this application has been revoked by the assignee who has intervened as provided by 37 CFR 3.71. Future correspondence will be mailed to the new address of record(37 CFR 1.33).

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at **(571) 272-4000** or **(571) 272-4200** or **1-888-786-0101**.

/pflewis/

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
90/015,063	06/23/2022	7233790	22104.12R	8395

22913 7590 08/17/2022

Workman Nydegger
60 East South Temple
Suite 1000
Salt Lake City, UT 84111

EXAMINER	
HENEGHAN, MATTHEW E	

ART UNIT	PAPER NUMBER
3992	

MAIL DATE	DELIVERY MODE
08/17/2022	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

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EX PARTE REEXAMINATION COMMUNICATION TRANSMITTAL FORM

REEXAMINATION CONTROL NO. *90/015,063* .

PATENT UNDER REEXAMINATION *7233790* .

ART UNIT *3992* .

Enclosed is a copy of the latest communication from the United States Patent and Trademark Office in the above identified *ex parte* reexamination proceeding (37 CFR 1.550(f)).

Where this copy is supplied after the reply by requester, 37 CFR 1.535, or the time for filing a reply has passed, no submission on behalf of the *ex parte* reexamination requester will be acknowledged or considered (37 CFR 1.550(g)).

PTOL-465 (Rev.07-04)

Order Granting Request For Ex Parte Reexamination	Control No. 90/015,063	Patent Under Reexamination 7233790	
	Examiner MATTHEW E HENEGHAN	Art Unit 3992	AIA (FITF) Status No

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

The request for *ex parte* reexamination filed 06/23/2022 has been considered and a determination has been made. An identification of the claims, the references relied upon, and the rationale supporting the determination are attached.

Attachments: a)☐ PTO-892, b)☑ PTO/SB/08, c)☐ Other: ____

1. ☑ The request for *ex parte* reexamination is GRANTED.

RESPONSE TIMES ARE SET AS FOLLOWS:

For Patent Owner's Statement (Optional): TWO MONTHS from the mailing date of this communication (37 CFR 1.530 (b)). **EXTENSIONS OF TIME ARE GOVERNED BY 37 CFR 1.550(c).**

For Requester's Reply (optional): TWO MONTHS from the **date of service** of any timely filed Patent Owner's Statement (37 CFR 1.535). **NO EXTENSION OF THIS TIME PERIOD IS PERMITTED.** If Patent Owner does not file a timely statement under 37 CFR 1.530(b), then no reply by requester is permitted.

cc:Requester (if third party requester)

ORDER GRANTING EX PARTE REEXAMINATION

Notice of Pre-AIA or AIA Status

The present application is being examined under the pre-AIA first to invent provisions.

Ex Parte Reexamination

A third party, Unified Patents, LLC, has requested *ex parte* reexamination of claims 1, 2, 4, 8, and 9 of U.S. Patent No. 7,233,790.

A substantial new question of patentability affecting claims 1, 2, 4, 8, and 9 of United States Patent Number 7,233,790 is raised by the request for *ex parte* reexamination.

The patent owner is reminded of the continuing responsibility under 37 CFR 1.565(a) to apprise the Office of any litigation activity, or other prior or concurrent proceeding, involving Patent No. 7,233,790 (hereinafter the '790 patent) throughout the course of this reexamination proceeding. The third party requester is also reminded of the ability to similarly apprise the Office of any such activity or proceeding throughout the course of this reexamination proceeding. See MPEP §§ 2207, 2282 and 2286.

Extensions of time under 37 CFR 1.136(a) will not be permitted in these proceedings because the provisions of 37 CFR 1.136 apply only to "an applicant" and not to parties in a reexamination proceeding. Additionally, 35 U.S.C. 305 requires that *ex parte* reexamination proceedings "will be conducted with special dispatch" (37 CFR 1.550(a)). Extensions of time in *ex parte* reexamination proceedings are provided for in 37 CFR 1.550(c).

Patent owner is notified that any proposed amendment to the specification and/or claims in this reexamination proceeding must comply with 37 CFR 1.530(d)-(j), must be formally presented pursuant to 37 CFR 1.52(a) and (b), and must contain any fees required by 37 CFR 1.20(c).

References

The following references have been supplied by the third party requester for proposed grounds of rejection:

U.S. Patent Application Publication No. 2002/0078178 to Senoh (hereinafter (Senoh)

U.S. Patent No. 6,035339 to Agraharam et al. (hereinafter Agraharam)

U.S. Patent No. 6,421,726 to Kenner et al. (hereinafter Kenner)

U.S. Patent No. 6,345,279 to Li et al. (hereinafter Li)

None of these references have been considered in a previous examination or final district court judgment.

Prosecution History

The '790 patent was originally filed as Application No. 10/600,746 on 19 June 2003, having claims 1-11. The application claimed priority to Provisional Patent Applications 60/393,024; 60/392,383; 60/393,041; and 60/392,999, all filed on 28 June 2002.

In a non-final office action mailed by the Office on 20 October 2006, claims 1-4 and 9 were rejected under 35 U.S.C. 102(e) over U.S. Patent No. 6,912,385 to Namba et al. (hereinafter Namba) or, alternatively, U.S. Patent Application Publication No. 2003/0060188 to Gidron et al. (hereinafter Gidron). Claims 5-8, 10, and 11 were indicated as containing allowable subject matter, without explanation.

The Applicant responded on 22 January 2007, cancelling claims 1-4, amending claim 9, and adding claims 12-18.

The Office mailed a Notice of Allowance on 16 March 2007. The Examiner stated that the claims were allowable because:

"The prior art fails to disclose a method and system of accessing content on a wireless communication device, that specifically includes receiving and storing a plurality of different implementations of the items of content. Neither does the prior art teach maintaining a catalog describing the items of content."

The patent was issued on 19 June 2007.

Independent Claims of the '790 Patent

Ex parte reexamination has been requested for the following four independent claims:

1. A method of providing access to content for use on wireless communication devices, the method comprising:

receiving and storing a plurality of items of content to be made available for use in wireless communication devices used by a plurality of wireless services subscribers, including receiving a plurality of different implementations of at least one of the items of content, where each implementation of any given item of content corresponds to a different set of device capabilities; and

maintaining a product catalog containing a description of the items of content, the product catalog including, in association with each item of content, a reference to each implementation of said item of content.

2. A method of providing access to digital content for use on wireless communication devices, the method comprising:

receiving and storing in a server system a plurality of items of digital content to be made available for use in wireless communication devices used by a plurality of wireless services subscribers, including receiving and storing a plurality of different implementations of at least one of the items of digital content, where each implementation of any given item of digital content corresponds to a different set of device capabilities;

operating the server system to maintain a product catalog containing a description of the items of digital content, wherein the product catalog includes, in association with each item of digital content, a reference to each implementation of said item of digital content;

receiving a request from a wireless device used by one of the subscribers;

in response to the request, selecting a portion of the product catalog to be presented to the subscriber, based on device capabilities of the wireless device used by the subscriber; and

presenting the selected portion of the product catalog to the subscriber via a wireless network, such that the selected portion, as presented to the subscriber, provides only a single description of each item of digital content in said portion, regardless of the number of implementations of each said item.

8. A system comprising:

a network interface through which to communicate over a communication network; and

a download manager to

receive and store a plurality of items of content to be made available for use in wireless communication devices used by a plurality of wireless telecommunications subscribers, including receiving a plurality of different implementations of at least one of the items of content, where each implementation of any given item of content corresponds to a different set of device capabilities; and

maintain a product catalog containing a description of the items of content, the product catalog including, in association with each item of content, a reference to each implementation of said item of content.

9. A system comprising:

a processor; and

a storage facility accessible to the processor and containing code which, when executed by the processor, causes the processing system to

receive and store a plurality of items of digital content to be made available for use in wireless communication devices used by a plurality of wireless telecommunications subscribers, including receiving and storing a plurality of different implementations of at least one of the items of digital content, where each implementation of any given item of digital content corresponds to a different set of device capabilities;

maintain a product catalog containing a description of the items of digital content, wherein the product catalog includes, in association with each item of digital content, a reference to each implementation of said item of digital content;

receive a request from a wireless device used by one of the subscribers;

in response to the request, select a portion of the product catalog to be presented to the subscriber, based on device capabilities of the wireless device used by the subscriber; and

cause the selected portion of the product catalog to be presented to the subscriber via a wireless telecommunications network, such that the selected portion, as presented to the subscriber, provides only a single description of each item of digital content in said portion, regardless of the number of implementations of each said item.

Substantial New Questions of Patentability (SNQ)

Senoh

Senoh discloses a content distribution system (see abstract) in which the content server generates and sends a catalog that includes content ID and content type. This was not taught by the art of record that was considered by the original examiner. It is AGREED that a reasonable examiner would consider Senoh, in conjunction with any of Agraharam, Kenner, and/or Li, important in determining patentability for claims 1, 2, 4, 8, and/or 9. A Substantial New Question of Patentability is therefore established.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MATTHEW E HENEGHAN whose telephone number is (571)272-3834. The examiner can normally be reached M-F 8-5.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at http://www.uspto.gov/interviewpractice.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Fuelling can be reached on (571)270-1367. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of published or unpublished applications may be obtained from Patent Center. Unpublished application information in Patent Center is available to registered users. To file and manage patent submissions in Patent Center, visit: https://patentcenter.uspto.gov. Visit https://www.uspto.gov/patents/apply/patent-center for more information about Patent Center and https://www.uspto.gov/patents/docx for information about filing in DOCX format. For additional questions, contact the Electronic Business Center (EBC) at 866-217-9197

(toll-free). If you would like assistance from a USPTO Customer Service

Representative, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/MATTHEW E HENEGHAN/
Primary Examiner, Art Unit 3992

Conferees:

/MINH DIEU NGUYEN/
Primary Examiner, Art Unit 3992
/MICHAEL FUELLING/
Supervisory Patent Examiner, Art Unit 3992

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	90/015,063	7233790
	Examiner	Art Unit
	MATTHEW E HENEGHAN	3992

CPC - Searched*		
Symbol	Date	Examiner

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

Search Notes		
Search Notes	Date	Examiner
Review of Prosecution History	08/10/2022	/MH/

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner

Reexamination	Application/Control No.	Applicant(s)/Patent Under Reexamination
	90/015,063	7233790
	Certificate Date	Certificate Number

Requester Correspondence Address: ☐ Patent Owner ☑ Third Party
GREENBERG TRAURIG 500 CAMPUS DRIVE SUITE 40 FLORHAM PARK, NJ 07932

LITIGATION REVIEW ☑	/MH/ (examiner initials)	10 August 2022 (date)
Case Name		Director Initials
1:21cv1448, 1:22cv229 (OPEN)		
3:12cv505, 3:13cv4134, 4:13cv4134 (CLOSED)		
15-1795, 15-1725 (CAFC, CLOSED)		

COPENDING OFFICE PROCEEDINGS	
TYPE OF PROCEEDING	NUMBER
None.	

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (01-22)
Approved for use through 05/31/2024. OMB 0651-0031
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT
(Not for submission under 37 CFR 1.99)

Application Number	
Filing Date	2022-06-17
First Named Inventor	Rikard M. Kjellberg
Art Unit	
Examiner Name	
Attorney Docket Number	185945.011700

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	6035339	A	2000-03-07	Agraharam et al.	
	2	6421726	B1	2002-07-16	Kenner et al.	
	3	6345279	B1	2002-02-05	Li et al.	
	4	7551913	B1	2009-06-23	Chien	
	5					

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U.S.PATENT APPLICATION PUBLICATIONS Remove

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20020078178	A1	2002-20-06	Senoh	

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	
	Filing Date	2022-06-17
	First Named Inventor	Rikard M. Kjellberg
	Art Unit	
	Examiner Name	
	Attorney Docket Number	185945.011700

	2	20010032335	A1	2001-10-18	Jones	

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FOREIGN PATENT DOCUMENTS Remove

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2]	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1							

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NON-PATENT LITERATURE DOCUMENTS Remove

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1	K. H. Britton, et al., Transcoding: Extending e-business to new environments, IBM Systems J., Vol. 40, No. 1 (2001), pp.153-178	
	2	Andrew Perkis, et al., Universal Multimedia Access from Wired and Wireless Systems, Circuits Systems Signal Processing, Vol. 20, No. 3 (2001), pp.387-402	
	3	Rakesh Mohan, et al., Adapting Multimedia Internet Content for Universal Access, IEEE Transactions on Multimedia, Vol. 1, No. 1, (March 1999), pp.104-114.	
	4	Excepts from Image File Wrapper of U.S. Patent Application No. 10/600,746	
	5	Declaration of A.L. Narasimha Reddy, Ph.D.	

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	
	Filing Date	2022-06-17
	First Named Inventor	Rikard M. Kjellberg
	Art Unit	
	Examiner Name	
	Attorney Docket Number	185945.011700

EXAMINER SIGNATURE			
Examiner Signature	/MATTHEW E HENEGHAN/	Date Considered	08/11/2022

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

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /M.E.H/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	
	Filing Date	2022-06-17
	First Named Inventor	Rikard M. Kjellberg
	Art Unit	
	Examiner Name	
	Attorney Docket Number	185945.011700

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Andrew R. Sommer/	Date (YYYY-MM-DD)	2022-06-23
Name/Print	Andrew R. Sommer	Registration Number	53,932

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
90/015,063	06/23/2022	7233790	22104.12R	8395

22913 7590 02/02/2023

Workman Nydegger
60 East South Temple
Suite 1000
Salt Lake City, UT 84111

EXAMINER	
HENEGHAN, MATTHEW E	

ART UNIT	PAPER NUMBER
3992	

MAIL DATE	DELIVERY MODE
02/02/2023	PAPER

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The time period for reply, if any, is set in the attached communication.

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EX PARTE REEXAMINATION COMMUNICATION TRANSMITTAL FORM

REEXAMINATION CONTROL NO. *90/015,063* .

PATENT UNDER REEXAMINATION *7233790* .

ART UNIT *3992* .

Enclosed is a copy of the latest communication from the United States Patent and Trademark Office in the above identified *ex parte* reexamination proceeding (37 CFR 1.550(f)).

Where this copy is supplied after the reply by requester, 37 CFR 1.535, or the time for filing a reply has passed, no submission on behalf of the *ex parte* reexamination requester will be acknowledged or considered (37 CFR 1.550(g)).

PTOL-465 (Rev.07-04)

Office Action in Ex Parte Reexamination	**Control No.** 90/015,063	**Patent Under Reexamination** 7233790	
	Examiner MATTHEW E HENEGHAN	**Art Unit** 3992	**AIA (FITF) Status** No

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

a. ☐ Responsive to the communication(s) filed on _____.
☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

b. ☐ This action is made FINAL.

c. ☑ A statement under 37 CFR 1.530 has not been received from the patent owner.

A shortened statutory period for response to this action is set to expire 2 month(s) from the mailing date of this letter. Failure to respond within the period for response will result in termination of the proceeding and issuance of an *ex parte* reexamination certificate in accordance with this action. 37 CFR 1.550(d). **EXTENSIONS OF TIME ARE GOVERNED BY 37 CFR 1.550(c).** If the period for response specified above is less than thirty (30) days, a response within the statutory minimum of thirty (30) days will be considered timely.

Part I THE FOLLOWING ATTACHMENT(S) ARE PART OF THIS ACTION:

1. ☐ Notice of References Cited by Examiner, PTO-892.
2. ☐ Information Disclosure Statement, PTO/SB/08.
3. ☐ Interview Summary, PTO-474.
4. ☐ _____.

Part II SUMMARY OF ACTION

1a. ☑ Claims 1-2,4 and 8-9 are subject to reexamination.
1b. ☑ Claims 3,5-7 and 10-14 are not subject to reexamination.
2. ☐ Claims _____ have been canceled in the present reexamination proceeding.
3. ☑ Claims 2,4 and 9 are patentable and/or confirmed.
4. ☑ Claims 1 and 8 are rejected.
5. ☐ Claims _____ are objected to.
6. ☐ The drawings, filed on _____ are acceptable.
7. ☐ The proposed drawing correction, filed on _____ has been (7a) ☐ approved (7b) ☐ disapproved.
8. ☐ Acknowledgment is made of the priority claim under 35 U.S.C. 119(a)-(d) or (f).
   a) ☐ All b) ☐ Some* c) ☐ None of the certified copies have
   1 ☐ been received.
   2 ☐ not been received.
   3 ☐ been filed in Application No. _____.
   4 ☐ been filed in reexamination Control No. _____.
   5 ☐ been received by the International Bureau in PCT application No. _____.
   * See the attached detailed Office action for a list of the certified copies not received.
9. ☐ Since the proceeding appears to be in condition for issuance of an *ex parte* reexamination certificate except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte* Quayle, 1935 C.D. 11, 453 O.G. 213.
10. ☐ Other: _____

cc: Requester (if third party requester)

ORDER GRANTING EX PARTE REEXAMINATION

Notice of Pre-AIA or AIA Status

The present application is being examined under the pre-AIA first to invent provisions.

Ex Parte Reexamination

A third party, Unified Patents, LLC, has requested *ex parte* reexamination of claims 1, 2, 4, 8, and 9 of U.S. Patent No. 7,233,790.

A substantial new question of patentability affecting claims 1, 2, 4, 8, and 9 of United States Patent Number 7,233,790 is raised by the request for *ex parte* reexamination. See Order Granting *Ex Parte* Reexamination, mailed 17 August 2022.

The patent owner is reminded of the continuing responsibility under 37 CFR 1.565(a) to apprise the Office of any litigation activity, or other prior or concurrent proceeding, involving Patent No. 7,233,790 (hereinafter the '790 patent) throughout the course of this reexamination proceeding. The third party requester is also reminded of the ability to similarly apprise the Office of any such activity or proceeding throughout the course of this reexamination proceeding. See MPEP §§ 2207, 2282 and 2286.

Extensions of time under 37 CFR 1.136(a) will not be permitted in these proceedings because the provisions of 37 CFR 1.136 apply only to "an applicant" and not to parties in a reexamination proceeding. Additionally, 35 U.S.C. 305 requires that *ex parte* reexamination proceedings "will be conducted with special dispatch" (37 CFR 1.550(a)). Extensions of time in *ex parte* reexamination proceedings are provided for in 37 CFR 1.550(c).

Patent owner is notified that any proposed amendment to the specification and/or claims in this reexamination proceeding must comply with 37 CFR 1.530(d)-(j), must be formally presented pursuant to 37 CFR 1.52(a) and (b), and must contain any fees required by 37 CFR 1.20(c).

In order to ensure full consideration of any amendments, affidavits or declarations, or other documents as evidence of patentability, such documents must be submitted in response to this Office action. Submissions after the next Office action, which is intended to be a final action, will be governed by the requirements of 37 CFR 1.116, after final rejection and 37 CFR 41.33 after appeal, which will be strictly enforced.

Claims 1, 2, 4, 8, and 9 have been examined.

References

The following references have been supplied by the third party requester for proposed grounds of rejection:

U.S. Patent Application Publication No. 2002/0078178 to Senoh (hereinafter (Senoh)

U.S. Patent No. 6,035339 to Agraharam et al. (hereinafter Agraharam)

U.S. Patent No. 6,421,726 to Kenner et al. (hereinafter Kenner)

U.S. Patent No. 6,345,279 to Li et al. (hereinafter Li)

Claim Rejections - 35 USC § 103

In the event the determination of the status of the application as subject to AIA 35 U.S.C. 102 and 103 (or as subject to pre-AIA 35 U.S.C. 102 and 103) is incorrect, any correction of the statutory basis for the rejection will not be considered a new ground of rejection if the prior art relied upon, and the rationale supporting the rejection, would be the same under either status.

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

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

Claims 1 and 8 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Senoh in view of Agraharam.

Regarding claim 1, Senoh discloses a method of providing access to content for use on wireless communication devices (content distribution using a cellular phone as a terminal, see abstract and paragraph 60), the method comprising: receiving and storing a plurality of items of content to be made available for use in wireless communication devices used by a plurality of wireless services subscribers (performed at a relay server to subscribers via cellular, see figure 4 and paragraphs 43-45); and maintaining a product catalog containing a description of the items of content (maintained at the relay server to subscribers via cellular, see figure 4 and paragraphs 43-45).

Senoh does not teach the receiving of a plurality of different implementations of at least one of the items of content, where each implementation of any given item of content corresponds to a different set of device capabilities; or that the product catalog includes, in association with each item of content, a reference to each implementation of said item of content. Senoh further notes that "a problem arises... when the specifications of the distributed content differ from the specifications of content that is viewable on the user's terminal or monitor (see paragraph 8).

Agraharam discloses a network information delivery system in which a network information delivery device (which corresponds to Senoh's relay server) receives and stores content from an information source (see column 2, lines 52-58), which may be formatted into a plurality of formats and are grouped according to the items of content (see figure 4 and column 4, lines 31-57). Agraharam further states that this addresses a problem where "if none of the predetermined formats are suitable for information

reproduction by the user terminal, the user terminal reproduces the information in an undesirable manner" (see column 1, lines 28-31).

Therefore it would have been obvious to one of ordinary skill in the art the time the invention was made to modify Senoh to store and make available an item of content in a plurality of formats in its catalog, as per Agraharam, to help ensure that the mobile device does not reproduce the information in an undesirable format.

Regarding claim 8, Senoh discloses a system (see abstract) comprising: a network interface through which to communicate over a communication network (see paragraph 29); and a download manager to receive and store a plurality of items of content to be made available for use in wireless communication devices used by a plurality of wireless telecommunications subscribers (Senoh's relay server, see paragraphs 43-45, constitutes a download manager that services users; these users may be using cellular phones, see paragraph 60); and maintains a product catalog containing a description of the items of content (maintained at the relay server to subscribers via cellular, see figure 4 and paragraphs 43-45).

Senoh does not teach the receiving of a plurality of different implementations of at least one of the items of content, where each implementation of any given item of content corresponds to a different set of device capabilities; or that the product catalog includes, in association with each item of content, a reference to each implementation of said item of content. Senoh further notes that "a problem arises… when the specifications of the distributed content differ from the specifications of content that is viewable on the user's terminal or monitor (see paragraph 8).

Agraharam discloses a network information delivery system in which a network information delivery device (which corresponds to Senoh's relay server) receives and stores content from an information source (see column 2, lines 52-58), which may be formatted into a plurality of formats/capabilities and are grouped according to the items of content (see figure 4 and column 4, lines 31-57). Agraharam further states that this addresses a problem where "if none of the predetermined formats are suitable for information reproduction by the user terminal, the user terminal reproduces the information in an undesirable manner" (see column 1, lines 28-31).

Therefore it would have been obvious to one of ordinary skill in the art the time the invention was made to modify Senoh to store and make available an item of content in a plurality of formats in its catalog, as per Agraharam, to help ensure that the mobile device does not reproduce the information in an undesirable format.

Allowable Subject Matter

Claims 2, 4, and 9 are confirmed.

The following is a statement of reasons for the indication of confirmed subject matter:

Regarding claims 2 and 9, the only primary reference considered, Senoh, explicitly teaches away from "selecting a portion of the product catalog to be presented to the subscriber, based on device capabilities of the wireless device used by the subscriber; and presenting the selected portion of the product catalog to the subscriber

via a wireless network, such that the selected portion, as presented to the subscriber, provides only a single description of each item of digital content in said portion, regardless of the number of implementations of each said item," as recited in claims 2 and 9. Senoh specifically states that it is an objective to enable a viewer terminal to enjoy content in the format of a display device that is different from the specifications of the user terminal (see paragraphs 8 and 15). Neither Kenner nor Li have been presented in such a way that one skilled in the art would be motivated to modify Senoh in a manner that would completely teach to the claimed inventions, as they would remove this critical functionality from Senoh's invention.

Claim 4 is confirmed based upon its dependence upon base claim 2.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MATTHEW E HENEGHAN whose telephone number is (571)272-3834. The examiner can normally be reached M-F 8-5.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at http://www.uspto.gov/interviewpractice.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Fuelling can be reached on (571)270-1367. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/MATTHEW E HENEGHAN/
Primary Examiner, Art Unit 3992

Conferees:

/MINH DIEU NGUYEN/
Primary Examiner, Art Unit 3992

/MICHAEL FUELLING/
Supervisory Patent Examiner, Art Unit 3992

Reexamination	Application/Control No.	Applicant(s)/Patent Under Reexamination
	90/015,063	7233790
	Certificate Date	Certificate Number

Requester Correspondence Address: ☐ **Patent Owner** ☑ **Third Party**

GREENBERG TRAURIG
500 CAMPUS DRIVE
SUITE 40
FLORHAM PARK, NJ 07932

LITIGATION REVIEW ☑	/MH/ (examiner initials)	26 January 2023 (date)
Case Name		Director Initials
1:21cv1448, 1:22cv229 (OPEN)		
3:12cv505, 3:13cv4134, 4:13cv4134 (CLOSED)		
15-1795, 15-1725 (CAFC, CLOSED)		

COPENDING OFFICE PROCEEDINGS	
TYPE OF PROCEEDING	**NUMBER**
None.	

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	90/015,063	7233790
	Examiner	Art Unit
	MATTHEW E HENEGHAN	3992

CPC - Searched*		
Symbol	Date	Examiner

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

Search Notes		
Search Notes	Date	Examiner
Review of Prosecution History	08/10/2022	/MH/
P-TACTS review of AIA proceedings	01/27/2023	/MH/
PDP (patent Data Portal) for continuity data	01/27/2023	/MH/

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
90/015,063	06/23/2022	7233790	22104.12R	8395

22913 7590 03/27/2023

Workman Nydegger
60 East South Temple
Suite 1000
Salt Lake City, UT 84111

EXAMINER	
HENEGHAN, MATTHEW E	

ART UNIT	PAPER NUMBER
3992	

MAIL DATE	DELIVERY MODE
03/27/2023	PAPER

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PATENT UNDER REEXAMINATION *7233790* .

ART UNIT *3992* .

Enclosed is a copy of the latest communication from the United States Patent and Trademark Office in the above identified *ex parte* reexamination proceeding (37 CFR 1.550(f)).

Where this copy is supplied after the reply by requester, 37 CFR 1.535, or the time for filing a reply has passed, no submission on behalf of the *ex parte* reexamination requester will be acknowledged or considered (37 CFR 1.550(g)).

PTOL-465 (Rev.07-04)

Ex Parte Reexamination Interview Summary	Control No.	Patent Under Reexamination	
	90/015,063	7233790	
	Examiner	Art Unit	AIA (FITF) Status
	MATTHEW E HENEGHAN	3992	No

All participants (USPTO personnel, patent owner, patent owner's representative):

(1) MATTHEW HENEGHAN	(3) MICHAEL FUELLING
(2) MINH DIEU NGUYEN	(4) LEVI BROWN

Date of Interview: 22 March 2023

Type: a) ☐ Telephonic b) ☑ Video Conference
c) ☐ Personal (copy given to: 1) ☐ patent owner 2) ☐ patent owners representative)

Exhibit shown or demonstration conducted: d) ☑ Yes e) ☐ No.
If Yes, brief description: Proposed amendment

Agreement with respect to the claims f) ☐ was reached. g) ☐ was not reached. h) ☐ N/A.
Any other agreement(s) are set forth below under "Description of the general nature of what was agreed to..."

Claim(s) discussed: 1 .

Identification of prior art discussed: Senoh, Agraharam .

Description of the general nature of what was agreed to if an agreement was reached, or any other comments:
See Continuation Sheet .

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

A FORMAL WRITTEN RESPONSE TO THE LAST OFFICE ACTION MUST INCLUDE PATENT OWNER'S STATEMENT OF THE SUBSTANCE OF THE INTERVIEW. (See MPEP § 2281). IF A RESPONSE TO THE LAST OFFICE ACTION HAS ALREADY BEEN FILED, THEN PATENT OWNER IS GIVEN **ONE MONTH** FROM THIS INTERVIEW DATE TO PROVIDE THE MANDATORY STATEMENT OF THE SUBSTANCE OF THE INTERVIEW
(37 CFR 1.560(b)). THE REQUIREMENT FOR PATENT OWNERS STATEMENT CAN NOT BE WAIVED.
EXTENSIONS OF TIME ARE GOVERNED BY 37 CFR 1.550(c).

		/MATTHEW E HENEGHAN/ Primary Examiner, Art Unit 3992

cc: Requester (if third party requester)

Continuation of Description of the general nature of what was agreed to if an agreement was reached, or any other comments: Patent Owner's representaive discussed a possible claim amendment to overcome the rejection of claim 1. The Examiner pointed out a possible issue under 35 U.S.C. 112, second paragraph and further pointed out the the cited art does not the the "single description of each item" limitation that was critical to overcoming the cited art in claim 2 et al. The proposed claim allows for multiple descriptions to be transmitted, which the cited art could be used to establish obviousness.

Facsimile

Note:

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Date: 03/20/2023

Pages: 2

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Interview Agenda
Docket No. 22104.12R
Reexamination Control No.: 90/015,063
Patent Under Exam: 7233790
Filed: June 23, 2022
Examiner: Matthew E. Heneghan
Examiner Phone Number: 571-272-3834
Fax Number: 571-273-8300

1. (Amended) A method of providing access to content for use on wireless communication devices, the method comprising:

receiving and storing a plurality of items of content to be made available for use in wireless communication devices used by a plurality of wireless services subscribers, including receiving a plurality of different implementations of at least one of the items of content, where each implementation of any given item of content corresponds to a different set of device capabilities; [and]

maintaining a product catalog containing a description of the items of content, the product catalog including, in association with each item of content, a reference to each implementation of said item of content[.];

selecting a portion of the product catalog, wherein the selected portion is determined to be supported by the wireless communication device; and

providing the selected portion to the wireless communication device.

DRAFT

PTO/SB/06 (09-11)
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 90/015,063	Filing Date 06/23/2022	☐ To be Mailed

ENTITY: ☑ LARGE ☐ SMALL ☐ MICRO

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA		RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A		N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A		N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*		x $100 =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*		x $480 =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).				
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))					
* If the difference in column 1 is less than zero, enter "0" in column 2.				TOTAL	

APPLICATION AS AMENDED - PART II

		(Column 1)		(Column 2)	(Column 3)			
AMENDMENT	03/31/2023	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 14	Minus	** 20	= 0		x $100 =	0
	Independent (37 CFR 1.16(h))	* 3	Minus	*** 3	= 0		x $480 =	0
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	0

		(Column 1)		(Column 2)	(Column 3)			
AMENDMENT		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=		x $0 =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=		x $0 =	
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.	LIE
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".	/PATRICIA F LEWIS/
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".	
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.	

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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FILED ELECTRONICALLY

PATENT APPLICATION
Docket No. 22104.12R

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:	US 7,233,790	)
		)
Serial No.:	90/015,063	) Art Unit
		) 3992
Filed:	June 23, 2022	)
		)
Conf. No.:	8395	)
		)
For:	DEVICE CAPABILITY BASED DISCOVERY PACKAGING AND PROVISIONING OF CONTENT FOR WIRELESS MOBILE DEVICES	)
		)
Examiner:	Matthew E. Heneghan	)
		)
Customer No.:	22913	)

AMENDMENT "A" AND RESPONSE
AFTER NON-FINAL OFFICE ACTION IN EX PARTE REEXAMINATION

Mail Stop AMENDMENT
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

The pending application is subject to an *ex parte* Reexamination. In response to a Non-Final Office Action, which was mailed on February 2, 2023, please amend the above-identified application as follows:

Amendments to the Claims are reflected in the listing of claims which begins on page 2 of this paper.

Remarks/Arguments begin on page 10 of this paper.

AMENDMENTS TO THE CLAIMS

This listing of claims is to replace all prior versions, and listings, of claims in the pending application:

Listing of Claims:

1. (Amended) A method of providing access to digital content for use on content consuming [wireless communication] devices, the method comprising:

receiving and storing in a server system a plurality of items of digital content [to be made available for use in wireless communication] accessible by the content consuming devices [used by a plurality of wireless services subscribers], including receiving and storing a plurality of different implementations of at least one of the items of digital content, where each implementation of any given item of digital content corresponds to a different set of device capabilities; [and]

operating the server system to maintain [maintaining] a product catalog containing a description of the items of digital content, wherein the product catalog includes[including], in association with each item of digital content, a reference to each implementation of said item of digital content[.];

receiving a request from one of the content consuming devices;

in response to the request, selecting a portion of the product catalog to be presented on the one content consuming device, based in part on device capabilities of the one content consuming device; and

presenting the selected portion of the product catalog to the one content consuming device, such that the selected portion, as presented, provides a single description of each item of digital content in said portion, regardless of a number of implementations that are available for each said item.

2. (Original) A method of providing access to digital content for use on wireless communication devices, the method comprising:

receiving and storing in a server system a plurality of items of digital content to be made available for use in wireless communication devices used by a plurality of wireless services subscribers, including receiving and storing a plurality of different implementations of at least one of the items of digital content, where each implementation of any given item of digital content corresponds to a different set of device capabilities;

operating the server system to maintain a product catalog containing a description of the items of digital content, wherein the product catalog includes, in association with each item of digital content, a reference to each implementation of said item of digital content;

receiving a request from a wireless device used by one of the subscribers;

in response to the request, selecting a portion of the product catalog to be presented to the subscriber, based on device capabilities of the wireless device used by the subscriber; and

presenting the selected portion of the product catalog to the subscriber via a wireless network, such that the selected portion, as presented to the subscriber, provides only a single description of each item of digital content in said portion, regardless of the number of implementations of each said item.

3. (Original) A method as recited in claim 2, wherein said selecting a portion of the product catalog comprises:

in response to the request, determining the identity of the wireless device used by the subscriber, wherein each implementation of the plurality of items of digital content has been previously associated in the server system with at least one device identity, according to corresponding device capabilities supported by the implementation; and

selecting the portion of the product catalog to be presented to the subscriber based on the identity of the wireless device used by the subscriber.

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

receiving from the subscriber a request for one of the items of digital content in said portion of the product catalog;

selecting an implementation of the requested item of digital content, based on device capabilities of the wireless device used by the subscriber; and

downloading the selected implementation of the item of digital content to the wireless device used by the subscriber.

5. (Original) A method as recited in claim 4, further comprising associating each of the items of digital content in the server system with a plurality of different provisioning models, each of the provisioning models corresponding to a different set of device capabilities, each provisioning model including a provisioning protocol and a corresponding set of provisioning attributes and descriptors for provisioning digital content in wireless devices.

6. (Original) A method as recited in claim 5, further comprising:

receiving from the subscriber a request for one of the items of digital content in said portion of the product catalog;

identifying device capabilities of the wireless device used by the subscriber;

selecting one of a plurality of provisioning models associated with the requested item in the server system, based on the device capabilities of the wireless device used by the subscriber;

packaging the requested item according to the selected provisioning model; and

provisioning the requested item in the wireless device used by the subscriber according to the selected provisioning model.

7. (Original) A method as recited in claim 6, wherein:

said packaging the requested item comprises creating a provisioning descriptor for the requested item according to the selected provisioning model, and associating the provisioning descriptor with the requested item; and

said provisioning the requested item in the wireless device comprises sending the packaged requested item to the wireless device used by the subscriber according to a provisioning protocol associated with the selected provisioning model.

8. (Amended) A system that provides access to digital content for use on content consuming devices, said system comprising:

a network interface through which to communicate over a communication network; and an application server [download manager] to:

receive and store a plurality of items of digital content [to be made available for use in wireless communication] accessible by the content consuming devices [used by a plurality of wireless telecommunications subscribers], including receiving and storing a plurality of different implementations of at least one of the items of digital content, where each implementation of any given item of digital content corresponds to a different set of device capabilities; [and]

maintain a product catalog containing a description of the items of digital content, wherein the product catalog includes[including], in association with each item of digital content, a reference to each implementation of said item of digital content[.];

receive a request from one of the content consuming devices;

in response to the request, select a portion of the product catalog to be presented on the one content consuming device, based in part on device capabilities of the one content consuming device; and

present the selected portion of the product catalog to the one content consuming device, such that the selected portion, as presented, provides a single description of each item of digital content in said portion, regardless of a number of implementations that are available for each said item.

9. (Original) A system comprising:

a processor; and

a storage facility accessible to the processor and containing code which, when executed by the processor, causes the processing system to receive and store a plurality of items of digital content to be made available for use in wireless communication devices used by a plurality of wireless telecommunications subscribers, including receiving and storing a plurality of different implementations of at least one of the items of digital content, where each implementation of any given item of digital content corresponds to a different set of device capabilities;

maintain a product catalog containing a description of the items of digital content, wherein the product catalog includes, in association with each item of digital content, a reference to each implementation of said item of digital content;

receive a request from a wireless device used by one of the subscribers;

in response to the request, select a portion of the product catalog to be presented to the subscriber, based on device capabilities of the wireless device used by the subscriber; and

cause the selected portion of the product catalog to be presented to the subscriber via a wireless telecommunications network, such that the selected portion, as presented to the subscriber, provides only a single description of each item of digital content in said portion, regardless of the number of implementations of each said item.

10. (Original) A system as recited in claim 9, wherein selection of said portion of the product catalog comprises:

in response to the request, determining the identity of the wireless device used by the subscriber, wherein each implementation of the plurality of items of digital content has been previously associated in the server system with at least one device identity, according to corresponding device capabilities supported by the implementation; and

selecting the portion of the product catalog to be presented to the subscriber based on the identity of the wireless device used by the subscriber.

11. (Original) A system as recited in claim 10, wherein said storage facility further contains code which, when executed by the processor, causes the processing system to:

receive from the subscriber a request for one of the items of digital content in said portion of the product catalog;

select an implementation of the requested item of digital content, based on device capabilities of the wireless device used by the subscriber; and

download the selected implementation of the item of digital content to the wireless device used by the subscriber.

12. (Original) A system as recited in claim 11, wherein said storage facility further contains code which, when executed by the processor, causes the processing system to:

associate each of the items of digital content in the server system with a plurality of different provisioning models, each of the provisioning models corresponding to a different set of device capabilities, each of the provisioning models including a provisioning protocol and a corresponding set of provisioning attributes and descriptors for provisioning digital content in wireless devices.

13. (Original) A system as recited in claim 12, wherein said storage facility further contains code which, when executed by the processor, causes the processing system to:

receive from the subscriber a request for one of the items of digital content in said portion of the product catalog;

identify device capabilities of the wireless device used by the subscriber;

select one of a plurality of provisioning models associated with the requested item in the server system, based on the device capabilities of the wireless device used by the subscriber;

package the requested item according to the selected provisioning model; and

provision the requested item in the wireless device used by the subscriber according to the selected provisioning model.

14. (Original) A system as recited in claim 13, wherein packaging the requested item comprises creating a provisioning descriptor for the requested item according to the selected provisioning model, and associating the provisioning descriptor with the requested item; and

wherein provisioning the requested item in the wireless device comprises sending the packaged requested item to the wireless device used by the subscriber according to a provisioning protocol associated with the selected provisioning model.

REMARKS

The Non-Final Office Action for the pending *ex parte* Reexamination was mailed on February 2, 2023. The Office Action considered claims 1, 2, 4, 8, and 9. Claims 3, 5, 6, 7, 10, 11, 12, 13, and 14 were not considered. Claims 2, 4, and 9 were confirmed. Claims 1 and 8 were rejected.

By this paper, claims 1 and 8 are amended. No claims have been added or cancelled.

Status Regarding Claim Amendments

As indicated above, the present application includes pending claims 1-14, with claims 1, 2, 8, and 9 being independent claims. With this amendment, Applicant has amended independent claims 1 and 8, as described below. Support for the amendments can be found throughout US 7,233,790. Specific passages of support from the '790 patent publication are referenced below.

Claim 1

Claim 1 has been amended in lines 1, 3, 6, 7, 10, 11, 12, and 19 to include the term "digital" as it relates to the "content" that is being used by the devices. Support for "digital content" can be found, for example, in col. 3 ln. 45-50.

Claim 1 has been further amended to substitute the phrase "content consuming devices" for "wireless communication devices" in lines 1, 2, and 4. Lines 13, 15, 16, 17, 18, and 19 also reference "content consuming devices." Support for this amendment can be found, for example, in col. 3 ln. 48-57 (e.g., referring to how a device is able to use content that has been designed for that device). The patent specification is explicitly clear that "the techniques described herein need not be limited to wireless services subscribers or mobile client devices." (*see e.g.,* col. 4, ln. 26-33). The prior art of record is not solely distinguishable on the lone basis of wireless communication devices.

Claim 1 has been further amended to recite a "server system" in lines 3 and 9. Support for this amendment can be found, for example, in col. 3 ln. 65-67.

In claim 1, the limitation "to be made available for use in wireless communication" has been removed from ln. 3-4. Condensed language (i.e. "accessible by") has been used in place of the removed phrase. These amendments were made to improve the readability of the claim and to make the claim more concise. Support for this amendment can be found, for example, in col. 2 ln. 50-52 and col. 4 ln. 23-25.

In claim 1, the phrase "used by a plurality of wireless services subscribers" has been removed from ln. 4-5. The removal of this language was also intended to improve the readability of the claim and to be consistent with the specification's explicit disclosure.

Claim 1 has been further amended to recite receiving "and storing" the different implementations in ln 5. Support for this amendment can be found, for example, in col. 11 ln. 56-58.

In claim 1, the term "maintaining" was changed to "maintain" in line 9 to ensure proper grammar.

In claim 1, the term "including" was changed to "includes" in line 10 to also ensure proper grammar.

Claim 1 was further amended to include the following limitation in ln. 13: "receiving a request from one of the content consuming devices." Support for this amendment can be found, for example, in col. 12 ln. 9-13.

Claim 1 was further amended to include the following limitation in ln. 14-16: "in response to the request, selecting a portion of the product catalog to be presented on the one content consuming device, based in part on device capabilities of the one content consuming device." Support for these amendments can be found, for example, in col. 9 ln. 13-18 as well as col 9 ln. 37-62.

Claim 1 was further amended to include the following limitation in ln. 17-20: "presenting the selected portion of the product catalog to the one content consuming device, such that the selected portion, as presented, provides a single description of each item of digital content in said portion, regardless of a number of implementations that are available for each said item." Support for this amendment can be found, for example, in col. 9 ln. 49-56.

Claim 8

Claim 8 has been amended to include the following limitation in ln. 1-2: "that provides access to digital content for use on content consuming devices, said system…" Support for the amendment can be found, for example, in col. 3 ln 45-57 as well as col. 4 ln. 23-25.

In claim 8, the phrase "download manager" has been replaced with "application server" in ln 4. Support for the amendment can be found, for example, in col. 3 ln. 67.

Claim 8 has been amended in lines 5, 8, 9, 11, 12, 13, 20 to include the term "digital" as it relates to the "content" that is being used by the devices. Support for "digital content" can be found, for example, in col. 3 ln. 45-50.

Claim 8 has been further amended to substitute the phrase "content consuming devices" for "wireless communication devices" in lines 1, 2, 6, 14, 16, 17, an 18. Support for this amendment can be found, for example, in col. 3 ln. 48-57 (e.g., referring to how a device is able to use content that has been designed for that device). The patent specification is explicitly clear that "the techniques described herein need not be limited to wireless services subscribers or mobile client devices." (*see e.g.,* col. 4, ln. 26-33). The prior art of record is not solely distinguishable on the lone basis of wireless communication devices.

In claim 8, the limitation "to be made available for use in wireless communication" has been removed from ln. 5-6. Condensed language (i.e. "accessible by") has been used in place of the removed limitation to improve the readability of the claim and to make the claim more concise. Support for this amendment can be found, for example, in col. 2 ln. 50-52 as well as col. 4 ln. 23-25.

In claim 8, the phrase "used by a plurality of wireless services subscribers" has been removed from ln. 6-7 to improve the readability of the claim and to be consistent with the specification's explicit disclosure.

Claim 8 has been further amended to recite receiving "and storing" the different implementations in ln 7. Support for this amendment can be found, for example, in col. 11 ln. 56-58.

In claim 8, the term "including" was changed to "includes" in line 12 to also ensure proper grammar.

Claim 8 was further amended to include the following limitation in ln. 14: "receive a request from one of the content consuming devices." Support for this amendment can be found, for example, in col. 12 ln. 9-13.

Claim 8 was further amended to include the following limitation in ln. 15-17: "in response to the request, select a portion of the product catalog to be presented on the one content consuming device, based in part on device capabilities of the one content consuming device." Support for these amendments can be found, for example, in col. 9 ln. 13-18 as well as col. 9 ln. 37-62.

Claim 8 was further amended to include the following limitation in ln. 18-21: "presenting the selected portion of the product catalog to the one content consuming device, such that the selected portion, as presented, provides a single description of each item of digital content in said portion, regardless of a number of implementations that are available for each said item." Support for this amendment can be found, for example, in col. 9 ln. 49-56.

Introductory Discussion Of The Claims

Independent claims 1 and 8 are directed to embodiments that provide access to digital content for use on content consuming devices. Claim 1, for example, is focused on a method that includes receiving and storing (e.g., in a server system) multiple items of digital content that are accessible by the content consuming devices. This action includes receiving and storing multiple different implementations of at least one of the items of digital content, where each implementation corresponds to a different set of device capabilities.

The method includes operating the server system to maintain a product catalog. This catalog includes a description of the items of digital content. The product catalog includes, in association with each item of digital content, a reference to each implementation.

The method also includes an action of receiving a request from one of the content consuming devices. In response, a portion of the product catalog is selected to be presented on the one content consuming device. This selection is based in part on the device capabilities of the one content consuming device.

The method then involves presenting the selected portion of the product catalog to the one content consuming device. As a result, the selected portion, as presented, provides a single description of each item of digital content in the portion, regardless of the number of implementations that are available for each item.

Interview Summary

Initially, Applicant thanks the Examiner for the courtesies extended during the recent interview held on March 22, 2023. During the course of the interview, the parties discussed a proposed set of amendments that related to the selection of a portion of the product catalog, where that portion was determined to be supported by the device. The amendments further related to the presentation of that selected portion to the device.

The amendments were discussed in view of the cited references. Applicant and the Examiner discussed in detail para. [0015] of the Senoh reference and how one object of the Senoh reference was to "enable[] a user to enjoy content in the format of a display device that is different from the specifications of the user terminal."

No agreement was reached regarding allowability of the claims at the time of the interview. The Examiner did suggest adding additional limitations (e.g., limitations similar to those present in independent claim 2) to further bolster the position of the claims.

35 U.S.C. §103 Rejections

Claims 1 and 8 were rejected under pre-AIA 35 U.S.C. §103(a) as being unpatentable in view of **Senoh** (US 2002/0078178) and **Agraharam** (US 6,035,339). In view of the current amendments, Applicant respectfully submits that the claimed embodiments are distinguishable over the cited references (either collectively or individually).

Briefly, Senoh describes a technique for distributing differently formatted content using a relay server. For example, para. [0029] mentions the following: "The content server 3 then sends the requested content to the relay server 2 in a first format specification." "The relay server 2 converts the content received from the content server 3 in the first format to a second format specification, and sends the reformatted content to the user terminal 1." Para. [0015] also says the following: "By converting content from a first format specification to a second format specification and sending the reformatted content to a viewer (user) terminal, the content

distribution system of the present invention enables a user to enjoy content in the format of a display device that is different from the specifications of the user terminal."

Agraharam describes a system capable of determining the "output requirements" for an end-user terminal. For instance, as mentioned in col. 5 ln. 20-23, Agraharam's "controller 302 determines the end-user information output requirements and then … packages the information based on the end-user information output requirements."

Claims 1 and 8 (hereinafter simply referred to as "the claims") have been amended to include subject matter that is quite similar to the subject matter presented in claim 2, which was found to be confirmed in view of the cited art, including Senoh and Agraharam. On pages 7-8 of the Office Action, the Office stated the following:

> Regarding claims 2 and 9, the only primary reference considered, Senoh, explicitly teaches away from "selecting a portion of the product catalog to be presented to the subscriber, based on device capabilities of the wireless device used by the subscriber; and presenting the selected portion of the product catalog to the subscriber via a wireless network, such that the selected portion, as presented to the subscriber, provides only a single description of each item of digital content in said portion, regardless of the number of implementations of each said item," as recited in claims 2 and 9. Senoh specifically states that it is an objective to enable a viewer terminal to enjoy content in the format of a display device that is different from the specifications of the user terminal (see paragraphs 8 and 15).

The claims have been amended to include similar limitations as those presented in claims 2 and 9. For the Office's convenience, a comparison chart for particular aspects of the claim language is provided below. The portions underlined represent some minor deviations between the claims.

Claim 1 (with claim 8 being similar)	Claim 2
receiving a request from *one of the content consuming devices*;	receiving a request from *a wireless device used by one of the subscribers*;
in response to the request, selecting a portion of the product catalog to be presented *on the one content consuming device*, based *in*	in response to the request, selecting a portion of the product catalog to be presented *to the subscriber*, based on device capabilities

part on device capabilities of the *one content consuming device*; and	of the *wireless device used by the subscriber*; and
presenting the selected portion of the product catalog to the *one content consuming device*, such that the selected portion, as presented, provides a single description of each item of digital content in said portion, regardless of *a* number of implementations *that are available for* each said item.	presenting the selected portion of the product catalog to the *subscriber via a wireless network*, such that the selected portion, as presented *to the subscriber*, provides *only* a single description of each item of digital content in said portion, regardless of the number of implementations *of* each said item.

As can be observed from the above language, the limitations of claim 1 (with claim 8 including similar amendments) now very closely track the limitations of claim 2. Minor differences are present between claims 1 and 2 (and 8) to ensure that they are of at least somewhat different scope.

One difference to particularly note between the claims is that claims 1 and 8 now reference a "content consuming device" whereas claim 2 references a "wireless device." Applicant respectfully submits that the substitution of "content consuming device" for "wireless device" should not significantly impact the analysis on patentability. As indicated above, such a change was made to ensure that claims 1 and 8 are not simply unnecessary duplicates of claim 2. To that end, the patent specification is explicitly clear that "the techniques described herein need not be limited to wireless services subscribers or mobile client devices." (*see e.g.,* col. 4, ln. 26-33). Importantly, the prior art of record is not solely distinguishable on the lone basis of wireless communication devices.

Another difference to note is the omission of the modifier "only" in the last limitation of claims 1 and 8 as compared to claim 2. After reviewing the language of claim 2, Applicant respectfully submits that the modifier "only" is a repetitive modifier in view of the modifier "single," as it relates to the "single description" limitation.

That is, the grammatical modifiers "only" and "single" are related to the digital content descriptions that are provided to the content consuming device. The modifier "single" incorporates the meaning of "only". Using both modifiers results in repetitive language. Applicant has elected to omit the modifier "only" so as to improve the readability of the claims and to make

the claims more concise, such as by removing repetitive language. As a result, Applicant respectfully submits that the modifier "only" can be removed without impacting the analysis on patentability. To further support such an assertion, consider the following.

The claims include a limitation in which the selected portion of the product catalog is presented to the content consuming device. Notably, the selected portion "provides a ***single*** description of each item of digital content … ***regardless*** of a number of implementations that are available for" that item. In other words, this language says that regardless of how many implementations are available for an item, the portion of the product catalog that is presented to the content consuming device will include a "single description" for each such item. Use of the modifier "single" limits the claims to a scenario in which one (and only one) description of each item of content will be provided.

Claim 2 includes similar language but further includes the repetitive modifier "only." For instance, claim 2 requires that the selected portion "provides only a single description of each item … regardless of the number of implementations of" that item. In this context, the modifiers "only" and "single" limit the claims in the same way and thus are redundant. That is, one description (not more than one) for an item will be provided to the content consuming device, regardless of how many implementations for that item might be available.

In view of the repetitive nature of the modifiers "only" and "single" (as used in this instance), Applicant respectfully submits that omitting the modifier "only" from claims 1 and 8 should not impact the analysis on patentability.

Furthermore, inasmuch as claims 1 and 8 now include substantially similar limitations as those found in claim 2, Applicant respectfully submits that claims 1 and 8 should be found to be allowable over the cited art for the same reasons that claim 2 was found to be allowable. More particularly, claims 1 and 8 should be found to be allowable over the combination of Senoh and Agraharam because that combination of art fails to teach or suggest any embodiment that requires at least the following features (when combined with the other limitations of the claims):

receiving a request from one of the content consuming devices;

in response to the request, selecting a portion of the product catalog to be presented on the one content consuming device, based in part on device capabilities of the one content consuming device; and

presenting the selected portion of the product catalog to the one content consuming device, such that the selected portion, as presented, provides a single description of each item of digital content in said portion, regardless of a number of implementations that are available for each said item.

Accordingly, for at least these reasons, as discussed above, the pending claims should be found to be distinguished from and patentable over the cited art and rejections of record.

In the event that the Examiner finds remaining impediment to a prompt allowance of this application that may be clarified through a telephone interview, the Examiner is requested to contact the undersigned attorney at 801-533-9800.

The Commissioner is hereby authorized to charge payment of any of the following fees that may be applicable to this communication, or credit any overpayment, to Deposit Account No. 23-3178: (1) any filing fees required under 37 CFR § 1.16; (2) any patent application and reexamination processing fees under 37 CFR § 1.17; and/or (3) any post issuance fees under 37 CFR § 1.20. In addition, if any additional extension of time is required, which has not otherwise been requested, please consider this a petition therefore and charge any additional fees that may be required to Deposit Account No. 23-3178.

Dated this 31st day of March 2023.

Respectfully submitted,

/Levi S. Brown/

LEVI S. BROWN
Registration No. 72,533
WORKMAN NYDEGGER
Attorney for Applicant
Customer No. 22913

LSB:jme

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FILED ELECTRONICALLY

PATENT APPLICATION
Docket No. 22104.12R

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of	US 7,233,790	)
		)
Serial No.:	90/015,063	) Art Unit
		) 3992
Filed:	June 23, 2022	)
		)
Conf. No.:	8395	)
		)
For:	DEVICE CAPABILITY BASED DISCOVERY PACKAGING AND PROVISIONING OF CONTENT FOR WIRELESS MOBILE DEVICES	)
		)
Examiner:	Matthew E. Heneghan	)
		)
Customer No.:	22913	)

NOTICE OF PRIOR AND CONCURRENT PROCEEDINGS

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

Patentee submits herewith the following notice of prior and concurrent proceedings which involve the above-identified patent.

1. *Starz Ent., LLC v. VideoLabs, Inc., No. 21-1448-JLH*

   Status: Complaint alleging invalidity contentions was filed on October 13, 2021 in the District of Delaware (Wilmington). An amended version of the complaint was filed on March 24, 2023.

2. *VideoLabs, Inc. v. Netflix Inc., No. 22-229-JHS*

Status: Complaint alleging infringement was filed on February 23, 2022 in the District of Delaware (Wilmington). An amended version of the complaint was filed on May 6, 2022.

In accordance with MPEP 1442.02, Applicants indicate their desire that the examination of this reissue application continue at this time.

Dated this 31st day of March 2023.

Respectfully submitted,

/Levi S. Brown/

LEVI S. BROWN
Registration No. 72,533
WORKMAN NYDEGGER
Attorney for Applicant
Customer No. 22913

LSB:jme

Electronic Acknowledgement Receipt	
EFS ID:	47773581
Application Number:	90015063
International Application Number:	
Confirmation Number:	8395
Title of Invention:	DEVICE CAPABILITY BASED DISCOVERY PACKAGING AND PROVISIONING OF CONTENT FOR WIRELESS MOBILE DEVICES
First Named Inventor/Applicant Name:	7233790
Customer Number:	22913
Filer:	Levi S. Brown/JENNIFER ESCAMILLA
Filer Authorized By:	Levi S. Brown
Attorney Docket Number:	22104.12R
Receipt Date:	31-MAR-2023
Filing Date:	23-JUN-2022
Time Stamp:	13:03:20
Application Type:	Reexam (Third Party)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		22104-12R-2023-03-31-Amendment-A.pdf	218458 5a694f1b9970452914ad35f763f99f688345b076	yes	18

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Amendment/Request for Reconsideration-After Non-Final Rejection	1	1
	Claims	2	9
	Applicant Arguments/Remarks Made in an Amendment	10	18

Warnings:					
Information:					
2	Notice of concurrent proceeding(s)	22104-12R-2023-03-31-Notice-of-Concurrent-Proceedings.pdf	127468 1121d635fae112d90fe1c95762c710bffd22a0bf	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	345926		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.
National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.
New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
90/015,063	06/23/2022	7233790	22104.12R	8395

22913 7590 04/10/2023

Workman Nydegger
60 East South Temple
Suite 1000
Salt Lake City, UT 84111

EXAMINER
HENEGHAN, MATTHEW E

ART UNIT	PAPER NUMBER
3992	

MAIL DATE	DELIVERY MODE
04/10/2023	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450
www.uspto.gov

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(THIRD PARTY REQUESTER'S CORRESPONDENCE ADDRESS)

GREENBERG TRAURIG
500 CAMPUS DRIVE
SUITE 40
FLORHAM PARK, NJ 07932

EX PARTE REEXAMINATION COMMUNICATION TRANSMITTAL FORM

REEXAMINATION CONTROL NO. *90/015,063* .

PATENT UNDER REEXAMINATION *7233790* .

ART UNIT *3992* .

Enclosed is a copy of the latest communication from the United States Patent and Trademark Office in the above identified *ex parte* reexamination proceeding (37 CFR 1.550(f)).

Where this copy is supplied after the reply by requester, 37 CFR 1.535, or the time for filing a reply has passed, no submission on behalf of the *ex parte* reexamination requester will be acknowledged or considered (37 CFR 1.550(g)).

PTOL-465 (Rev.07-04)

Notice of Pre-AIA or AIA Status

The present application is being examined under the pre-AIA first to invent provisions.

Ex Parte Reexamination

A third party, Unified Patents, LLC, has requested *ex parte* reexamination of claims 1, 2, 4, 8, and 9 of U.S. Patent No. 7,233,790.

A substantial new question of patentability affecting claims 1, 2, 4, 8, and 9 of United States Patent Number 7,233,790 is raised by the request for *ex parte* reexamination. See Order Granting *Ex Parte* Reexamination, mailed 17 August 2022.

The patent owner is reminded of the continuing responsibility under 37 CFR 1.565(a) to apprise the Office of any litigation activity, or other prior or concurrent proceeding, involving Patent No. 7,233,790 (hereinafter the '790 patent) throughout the course of this reexamination proceeding. The third party requester is also reminded of the ability to similarly apprise the Office of any such activity or proceeding throughout the course of this reexamination proceeding. See MPEP §§ 2207, 2282 and 2286.

Extensions of time under 37 CFR 1.136(a) will not be permitted in these proceedings because the provisions of 37 CFR 1.136 apply only to "an applicant" and not to parties in a reexamination proceeding. Additionally, 35 U.S.C. 305 requires that

ex parte reexamination proceedings "will be conducted with special dispatch" (37 CFR 1.550(a)). Extensions of time in *ex parte* reexamination proceedings are provided for in 37 CFR 1.550(c).

Patent owner is notified that any proposed amendment to the specification and/or claims in this reexamination proceeding must comply with 37 CFR 1.530(d)-(j), must be formally presented pursuant to 37 CFR 1.52(a) and (b), and must contain any fees required by 37 CFR 1.20(c).

In order to ensure full consideration of any amendments, affidavits or declarations, or other documents as evidence of patentability, such documents must be submitted in response to this Office action. Submissions after the next Office action, which is intended to be a final action, will be governed by the requirements of 37 CFR 1.116, after final rejection and 37 CFR 41.33 after appeal, which will be strictly enforced.

In response to the previous office action, claims 1 and 8 have been amended. Claims 1, 2, 4, 8, and 9 have been examined.

References

The following references have been supplied by the third party requester for proposed grounds of rejection:

U.S. Patent Application Publication No. 2002/0078178 to Senoh (hereinafter (Senoh)

U.S. Patent No. 6,035339 to Agraharam et al. (hereinafter Agraharam)

U.S. Patent No. 6,421,726 to Kenner et al. (hereinafter Kenner)

U.S. Patent No. 6,345,279 to Li et al. (hereinafter Li)

Claim Rejections - 35 USC § 305

Claims 1 and 8 are rejected under 35 U.S.C. 305 as enlarging the scope of the claim(s) of the patent being reexamined. In 35 U.S.C. 305, it is stated that "[n]o proposed amended or new claim enlarging the scope of a claim of the patent will be permitted in a reexamination proceeding...." A claim presented in a reexamination "enlarges the scope" of the patent claim(s) where the claim is broader than each and every claim of the patent. A claim is broader in scope than the original claims if it contains within its scope any conceivable product or process which would not have infringed the original patent. A claim is broadened if it is broader in any one respect, even though it may be narrower in other respects.

Claims 1 and 8 no longer encompass a method (in the case of claim 1) or a system (in the case of claim 8) in which “a plurality of items of… content to be made available in wireless communication… devices used by a plurality of wireless

subscribers," as recited in the claims of the '790 patent. They are therefore impermissibly enlarging in scope.

Allowable Subject Matter

Claims 2, 4, and 9 are confirmed.

Claims 1 and 8 would be patentable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 305 set forth in this Office action.

The following is a statement of reasons for the indication of confirmed subject matter:

Regarding claims 1, 2, 8, and 9, the only primary reference considered, Senoh, explicitly teaches away from "selecting a portion of the product catalog to be presented to the subscriber, based on device capabilities of the wireless device used by the subscriber; and presenting the selected portion of the product catalog to the subscriber via a wireless network, such that the selected portion, as presented to the subscriber, provides only a single description of each item of digital content in said portion, regardless of the number of implementations of each said item," as recited in claims 2 and 9. Senoh specifically states that it is an objective to enable a viewer terminal to enjoy content in the format of a display device that is different from the specifications of the user terminal (see paragraphs 8 and 15). Neither Kenner nor Li have been presented in such a way that one skilled in the art would be motivated to modify Senoh

in a manner that would completely teach to the claimed inventions, as they would remove this critical functionality from Senoh's invention.

Claim 4 is confirmed based upon its dependence upon base claim 2.

Conclusion

Patent owner's amendment filed 31 March 2023 necessitated the new grounds of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

A shortened statutory period for response to this action is set to expire 2 MONTHS from the mailing date of this action.

Extensions of time under 37 CFR 1.136(a) do not apply in reexamination proceedings. The provisions of 37 CFR 1.136 apply only to "an applicant" and not to parties in a reexamination proceeding. Further, in 35 U.S.C. 305 and in 37 CFR 1.550(a), it is required that reexamination proceedings "will be conducted with special dispatch within the Office."

Extensions of time in reexamination proceedings are provided for in 37 CFR 1.550(c). A request for extension of time must specify the requested period of extension and it must be accompanied by the petition fee set forth in 37 CFR 1.17(g). Any request for an extension in a third party requested ex parte reexamination must be filed on or before the day on which action by the patent owner is due, and the mere filing of a request will not effect any extension of time. A request for an extension of time in a third party requested ex parte reexamination will be granted only for sufficient

cause, and for a reasonable time specified. Any request for extension in a patent owner requested ex parte reexamination (including reexamination ordered under 35 U.S.C. 257) for up to two months from the time period set in the Office action must be filed no later than two months from the expiration of the time period set in the Office action. A request for an extension in a patent owner requested ex parte reexamination for more than two months from the time period set in the Office action must be filed on or before the day on which action by the patent owner is due, and the mere filing of a request for an extension for more than two months will not effect the extension. The time for taking action in a patent owner requested ex parte reexamination will not be extended for more than two months from the time period set in the Office action in the absence of sufficient cause or for more than a reasonable time.

The filing of a timely first response to this final rejection will be construed as including a request to extend the shortened statutory period for an additional two months. In no event, however, will the statutory period for response expire later than SIX MONTHS from the mailing date of the final action. See MPEP § 2265.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MATTHEW E HENEGHAN whose telephone number is (571)272-3834. The examiner can normally be reached M-F 8-5.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at http://www.uspto.gov/interviewpractice.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Fuelling can be reached on (571)270-1367. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of published or unpublished applications may be obtained from Patent Center. Unpublished application information in Patent Center is available to registered users. To file and manage patent submissions in Patent Center, visit: https://patentcenter.uspto.gov. Visit https://www.uspto.gov/patents/apply/patent-center for more information about Patent Center and https://www.uspto.gov/patents/docx for information about filing in DOCX format. For additional questions, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/MATTHEW E HENEGHAN/
Primary Examiner, Art Unit 3992

Conferees:

/DEANDRA M HUGHES/
Reexamination Specialist, Art Unit 3992

/ANDREW J. FISCHER/
Supervisory Patent Reexamination Specialist, Art Unit 3992

Office Action in Ex Parte Reexamination	**Control No.** 90/015,063	**Patent Under Reexamination** 7233790	
	Examiner MATTHEW E HENEGHAN	**Art Unit** 3992	**AIA (FITF) Status** No

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

a. ☑ Responsive to the communication(s) filed on 31 March 2023.
☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

b. ☑ This action is made FINAL.

c. ☐ A statement under 37 CFR 1.530 has not been received from the patent owner.

A shortened statutory period for response to this action is set to expire 2 month(s) from the mailing date of this letter. Failure to respond within the period for response will result in termination of the proceeding and issuance of an *ex parte* reexamination certificate in accordance with this action. 37 CFR 1.550(d). **EXTENSIONS OF TIME ARE GOVERNED BY 37 CFR 1.550(c).** If the period for response specified above is less than thirty (30) days, a response within the statutory minimum of thirty (30) days will be considered timely.

Part I THE FOLLOWING ATTACHMENT(S) ARE PART OF THIS ACTION:

1. ☐ Notice of References Cited by Examiner, PTO-892.
2. ☐ Information Disclosure Statement, PTO/SB/08.
3. ☐ Interview Summary, PTO-474.
4. ☐ _____.

Part II SUMMARY OF ACTION

1a. ☑ Claims 1-2,4 and 8-9 are subject to reexamination.
1b. ☑ Claims 3,5-7 and 10-14 are not subject to reexamination.
2. ☐ Claims _____ have been canceled in the present reexamination proceeding.
3. ☑ Claims 2,4 and 9 are patentable and/or confirmed.
4. ☑ Claims 1 and 8 are rejected.
5. ☐ Claims _____ are objected to.
6. ☐ The drawings, filed on _____ are acceptable.
7. ☐ The proposed drawing correction, filed on _____ has been (7a) ☐ approved (7b) ☐ disapproved.
8. ☐ Acknowledgment is made of the priority claim under 35 U.S.C. 119(a)-(d) or (f).
   a) ☐ All b) ☐ Some* c) ☐ None of the certified copies have
   1 ☐ been received.
   2 ☐ not been received.
   3 ☐ been filed in Application No. _____.
   4 ☐ been filed in reexamination Control No. _____.
   5 ☐ been received by the International Bureau in PCT application No. _____.
   * See the attached detailed Office action for a list of the certified copies not received.
9. ☐ Since the proceeding appears to be in condition for issuance of an *ex parte* reexamination certificate except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte* Quayle, 1935 C.D. 11, 453 O.G. 213.
10. ☐ Other: _____

cc: Requester (if third party requester)

Reexamination	Application/Control No.	Applicant(s)/Patent Under Reexamination
	90/015,063	7233790
	Certificate Date	Certificate Number

Requester Correspondence Address: ☐ Patent Owner ☑ Third Party
GREENBERG TRAURIG 500 CAMPUS DRIVE SUITE 40 FLORHAM PARK, NJ 07932

LITIGATION REVIEW ☑	/MH/ (examiner initials)	06 April 2023 (date)
Case Name		Director Initials
1:21cv1448, 1:22cv229 (OPEN)		
3:12cv505, 3:13cv4134, 4:13cv4134 (CLOSED)		
15-1795, 15-1725 (CAFC, CLOSED)		
Starz Ent., LLC v. VideoLabs, 21-1448-JLH (OPEN)		
VideoLabs, Inc. v. Netflix Inc., 22-229-JHS (OPEN)		

COPENDING OFFICE PROCEEDINGS	
TYPE OF PROCEEDING	**NUMBER**
Inter Partes Review	IPR2023-00628

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	90/015,063	7233790
	Examiner	Art Unit
	MATTHEW E HENEGHAN	3992

CPC - Searched*		
Symbol	Date	Examiner

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

Search Notes		
Search Notes	Date	Examiner
Review of Prosecution History	08/10/2022	/MH/
P-TACTS review of AIA proceedings	01/27/2023	/MH/
PDP (patent Data Portal) for continuity data	01/27/2023	/MH/
P-TACTS update review	04/06/2023	/MH/
Global Dossier Search	04/06/2023	/MH/

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner

PTO/SB/08a (01-22)
Approved for use through 05/31/2024. OMB 0651-0031
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Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT
(Not for submission under 37 CFR 1.99)

Application Number	90015063
Filing Date	2022-06-23
First Named Inventor	7233790
Art Unit	3992
Examiner Name	HENEGHAN, MATTHEW E
Attorney Docket Number	22104.12R

U.S.PATENTS						
Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	5694546	A	1997-12-02	REISMAN RICHARD R.	
	2	6052367	A	2000-04-18	BOWATER et al.	
	3	6076059	A	2000-06-13	GLICKMAN et al.	
	4	6151631	A	2000-11-21	ANSELL et al.	
	5	6161140	A	2000-12-12	MORIYA KOJI	
	6	6216133	B1	2001-04-10	MASTHOFF JUDITH F. M.	
	7	6223291	B1	2001-04-24	PUHL et al.	
	8	6289452	B1	2001-09-11	ARNOLD et al.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	90015063
	Filing Date	2022-06-23
	First Named Inventor	7233790
	Art Unit	3992
	Examiner Name	HENEGHAN, MATTHEW E
	Attorney Docket Number	22104.12R

	9	6324578	B1	2001-11-27	COX et al.	
	10	6430174	B1	2002-08-06	JENNINGS et al.	
	11	6483523	B1	2002-11-19	FENG MING-WHEI	
	12	6496979	B1	2002-12-17	CHEN et al.	
	13	6591288	B1	2003-07-08	EDWARDS et al.	
	14	6704024	B2	2004-03-09	ROBOTHAM et al.	
	15	6763377	B1	2004-07-13	BELKNAP et al.	
	16	6832241	B2	2004-12-14	TRACTON et al.	
	17	6845400	B2	2005-01-18	MACPHERSON et al.	
	18	6928481	B1	2005-08-09	HARRIS et al.	
	19	6988014	B2	2006-01-17	KRAEMER et al.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	90015063
	Filing Date	2022-06-23
	First Named Inventor	7233790
	Art Unit	3992
	Examiner Name	HENEGHAN, MATTHEW E
	Attorney Docket Number	22104.12R

	20	7072861	B1	2006-07-04	YAMANAKA et al.	
	21	7103906	B1	2006-09-05	KATZ et al.	
	22	7200777	B1	2007-04-03	Bouchee Dick G.	
	23	7243136	B2	2007-07-10	HUSTON et al.	
	24	7266369	B2	2007-09-04	MOLES et al.	
	25	7281047	B2	2007-10-09	HAYKO et al.	
	26	7283811	B2	2007-10-16	GIDRON et al.	
	27	7383347	B2	2008-06-03	EBLING et al.	
	28	7562300	B1	2009-07-14	TOBIAS et al.	
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	30	7730165	B2	2010-06-01	Shapiro Jody J	

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	First Named Inventor	7233790
	Art Unit	3992
	Examiner Name	HENEGHAN, MATTHEW E
	Attorney Docket Number	22104.12R

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Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

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☐ See attached certification statement.

☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Levi S. Brown/	Date (YYYY-MM-DD)	2023-04-13
Name/Print	Levi S. Brown	Registration Number	72533

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Publication Number: JP 03-122712 A
Publication Date: May 24, 1991

Abstract

PURPOSE:To improve probability for attaining the streaming operation of a streaming tape device by controlling the reading order of a file constitution block so that the moving time of a reading head of a magnetic disk device is minimized. CONSTITUTION:A backup means 6 reads out a file information block of a file to be backed up from a magnetic disk device 3, forms backup information consisting of a pair of file constitution block order information and position information, aligns the backup information in the position information order and writes the aligned backup information and the file information block in the streaming tape device 4. On the other hand, a restoring means 7 reads out the backup information and the file information block from the device 4, aligns the backup information in the order information order, updates the file information block based upon the aligned backup information and writes the updated block in the magnetic disk device 3. Consequently, the probability for attaining the streaming operation of the streaming tape device 4 can be improved.

⑲日本国特許庁(JP)　⑪特許出願公開

⑫公開特許公報(A)　平3−122712

⑤1Int.Cl.⁵	識別記号	庁内整理番号	⑬公開　平成3年(1991)5月24日
G 06 F 3/06	304 F	6711−5B	
12/00	302 E	8944−5B	

審査請求　未請求　請求項の数 1　(全5頁)

⑤4発明の名称　フアイルのバツクアツプ方式

⑳特　願　平1−261168
㉒出　願　平1(1989)10月5日

⑦2発明者　小川　直孝　東京都港区芝5丁目33番1号　日本電気株式会社内
⑦1出願人　日本電気株式会社　東京都港区芝5丁目7番1号
⑦4代理人　弁理士　河原　純一

明　細　書

1．発明の名称

ファイルのバックアップ方式

2．特許請求の範囲

ファイルが固定長ブロックの並びとして実現される磁気ディスク装置およびストリーミングテープ装置を備える計算機システムにおいて、

磁気ディスク装置からバックアップの対象ファイルのファイル情報ブロックを読み出しファイル構成ブロックの順序情報と位置情報との対からなるバックアップ情報を生成して位置情報順に整列させ整列されたバックアップ情報およびファイル情報ブロックをストリーミングテープ装置に書き込みバックアップ情報の整列された位置情報順にファイル構成ブロックを磁気ディスク装置から読み込んでストリーミングテープ装置に書き込むバックアップ手段と、

ストリーミングテープ装置からバックアップ情報およびファイル情報ブロックを読み出しストリーミングテープ装置からファイル構成ブロックを読み出し磁気ディスク装置に書き込んでバックアップ情報の位置情報を更新しバックアップ情報を順序情報順に整列して整列されたバックアップ情報に基づいてファイル情報ブロックを更新し磁気ディスク装置に書き込むリストア手段と

を有することを特徴とするファイルのバックアップ方式。

3．発明の詳細な説明

〔産業上の利用分野〕

本発明はファイルのバックアップ方式に関し、特にファイルが固定長ブロックの並びとして実現される磁気ディスク装置およびストリーミングテープ装置を備える計算機システムにおけるファイルのバックアップ方式に関する。

〔従来の技術〕

従来、この種のファイルのバックアップ方式では、磁気ディスク装置上のバックアップ対象のファイルについて、そのファイルの内容を構成するブロック（以下、ファイルの管理情報を格納するファイル情報ブロックと区別してファイル構成ブ

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ロックという）の位置関係にかかわりなく、ファイルの構成順序に従って先頭のファイル構成ブロックから順次読出しを行い、ストリーミングテープ装置に順次書き出していた。

〔発明が解決しようとする課題〕

上述した従来のファイルのバックアップ方式では、磁気ディスク装置上のファイル構成ブロック間の相対的な位置に関係なしにファイルの構成順序に従ってファイル構成ブロックの読出しを行うようになっていたので、磁気ディスク装置の読出しヘッドが次に読み出すファイル構成ブロックに移動する時間がストリーミングテープ装置のストリーミング動作を保証するのに必要な時間を上回る確率が高くなり、ストリーミングテープ装置でテープをストリーミング動作させることができずにテープのスタートおよびストップが発生してテープ上の記録の信頼性を低下させるという欠点がある。

本発明の目的は、上述の点に鑑み、磁気ディスク装置の読出しヘッドの移動時間が最小になるようにファイル構成ブロックの読出し順序を制御して、ストリーミングテープ装置のストリーミング動作が可能になる確率を高めるようにしたファイルのバックアップ方式を提供することにある。

〔課題を解決するための手段〕

本発明のファイルのバックアップ方式は、ファイルが固定長ブロックの並びとして実現される磁気ディスク装置およびストリーミングテープ装置を備える計算機システムにおいて、磁気ディスク装置からバックアップ対象のファイルのファイル情報ブロックを読み出しファイル構成ブロックの順序情報と位置情報との対からなるバックアップ情報を生成して位置情報順に整列させ整列されたバックアップ情報およびファイル情報ブロックをストリーミングテープ装置に書き込みバックアップ情報の整列された位置情報順にファイル構成ブロックを磁気ディスク装置から読み込んでストリーミングテープ装置に書き込むバックアップ手段と、ストリーミングテープ装置からバックアップ情報およびファイル情報ブロックを読み出しストリーミングテープ装置からファイル構成ブロックを読み出し磁気ディスク装置に書き込んでバックアップ情報の位置情報を更新しバックアップ情報を順序情報順に整列して整列されたバックアップ情報に基づいてファイル情報ブロックを更新し磁気ディスク装置に書き込むリストア手段とを有する。

〔作用〕

本発明のファイルのバックアップ方式では、バックアップ手段が磁気ディスク装置からバックアップ対象のファイルのファイル情報ブロックを読み出しファイル構成ブロックの順序情報と位置情報との対からなるバックアップ情報を生成して位置情報順に整列させ整列されたバックアップ情報およびファイル情報ブロックをストリーミングテープ装置に書き込みバックアップ情報の整列された位置情報順にファイル構成ブロックを磁気ディスク装置から読み込んでストリーミングテープ装置に書き込み、リストア手段がストリーミングテープ装置からバックアップ情報およびファイル情報ブロックを読み出しストリーミングテープ装置からファイル構成ブロックを読み出し磁気ディスク装置に書き込んでバックアップ情報の位置情報を更新しバックアップ情報を順序情報順に整列して整列されたバックアップ情報に基づいてファイル情報ブロックを更新し磁気ディスク装置に書き込む。

〔実施例〕

次に、本発明について図面を参照して詳細に説明する。

第1図は、本発明の一実施例に係るファイルのバックアップ方式が適用された計算機システムの構成を示すブロック図である。この計算機システムは、計算機1と、計算機1に含まれる主記憶2と、計算機1に接続された磁気ディスク装置3と、同じく計算機1に接続されたストリーミングテープ装置4とから、その主要部が構成されている。

主記憶2上には、バックアップ処理を行うバックアップ手段6およびリストア処理を行うリストア手段7からなるバックアッププログラム5が搭

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載されているとともに、バックアッププログラム５が使用する作業領域８が設けられている。

磁気ディスク装置３内の領域は、各ファイル１３のファイル情報ブロック１１および空きブロック管理リスト１６の空きブロック情報ブロック１４を格納するファイル管理域９と、各ファイル１３のファイル構成ブロック１２および空きブロック管理リスト１６の空きブロック１５を格納するファイルブロック域１０とに分けられている。なお、ファイル構成ブロック１２および空きブロック１５は、固定長となっている。

ファイル情報ブロック１１には、ファイル１３のファイル名，大きさ，ファイル構成ブロック１２の構成順序を示す情報である順序番号および位置情報等のファイル管理情報が格納されている。

空きブロック情報ブロック１４には、ファイル１３と同様の形式の空きブロック管理リスト１６の大きさ，空きブロック１５の構成順序を示す順序番号および位置情報等の空きブロック管理情報が格納されている。なお、空きブロック１５の順序は、空きブロック１５間の移動距離が常に最小となるように位置情報順に整列されている。

第２図を参照すると、バックアップ手段６の処理は、ファイル情報ブロック読出しステップ２１と、バックアップ情報生成ステップ２２と、バックアップ情報整列ステップ２３と、バックアップ情報書込みステップ２４と、ファイル情報ブロック書込みステップ２５と、ファイル構成ブロック読出しおよび書込みステップ２６と、テープマーク書込みステップ２７とからなる。

第３図を参照すると、リストア手段７の処理は、バックアップ情報読出しステップ３１と、ファイル情報ブロック読出しステップ３２と、ファイル構成ブロック読出しおよび書込みステップ３３と、バックアップ情報整列ステップ３４と、ファイル情報ブロック更新および書込みステップ３５とからなる。

次に、このように構成された本実施例のファイルのバックアップ方式の動作について説明する。

(1)　バックアップ処理

ファイル１３のバックアップを指定されてバックアッププログラム５が起動されると、バックアップ手段６は、まずバックアップ対象のファイル１３のファイル情報ブロック１１を磁気ディスク装置３のファイル管理域５から読み出して主記憶２上の作業領域８に記憶する（ステップ２１）。

次に、バックアップ手段６は、ステップ２１にて読み出したファイル情報ブロック１１からファイル１３を構成するすべてのファイル構成ブロック１２の順序番号および位置情報を取り出し、ファイル構成ブロック１２毎に順序番号と位置情報とを対にした形式のバックアップ情報を作業領域８に生成する（ステップ２２）。

続いて、バックアップ手段６は、ステップ２２にて生成したバックアップ情報を磁気ディスク装置３の読取りヘッドの移動時間が最小になるようにファイル構成ブロック１２の位置情報をキーとして整列させる（ステップ２３）。

次に、バックアップ手段６は、ストリーミングテープ装置４を起動し、ステップ２３にて整列させたバックアップ情報をファイル１３のリストア時に再使用するためにストリーミングテープ装置４に書き込む（ステップ２４）。

続いて、バックアップ手段６は、作業領域８に記憶しているファイル１３のファイル情報ブロック１１をストリーミングテープ装置４に書き込む（ステップ２５）。

次に、バックアップ手段６は、バックアップ情報の先頭エントリからファイル構成ブロック１２の位置情報を順次取り出し、位置情報が示すファイル構成ブロック１２を磁気ディスク装置３より読み出してストリーミングテープ装置４に書き込む（ステップ２６）。この際、ファイル構成ブロック１２が磁気ディスク装置３から位置情報順に読み出されるので、磁気ディスク装置３の読出しヘッドの移動時間が最小になり、このためストリーミングテープ装置４のストリーミング動作が可能になる確率が高まる。このファイル構成ブロック１２の読出しおよび書込みをバックアップ情報の全エントリが尽きるまで繰り返し行う。

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バックアップ情報のエントリが尽きると、バックアップ手段６は、書込み終了を示すテープマークをストリーミングテープ装置４に書き込み（ステップ２７）、ストリーミングテープ装置４を停止させる。

以上で、ファイル１３のバックアップが終了する。

(2) リストア処理

ファイル１３のリストアを指定されてバックアッププログラム５が起動されると、リストア手段７は、まずリストア対象のファイル１３がバックアップされているテープ媒体が装填されたストリーミングテープ装置４を起動し、バックアップ時に生成して書き込んでおいたバックアップ情報を読み出して主記憶２の作業領域８に記憶する（ステップ３１）。

次に、リストア手段７は、ストリーミングテープ装置４を使用してリストア対象のファイル１３のファイル情報ブロック１１を読み出し、主記憶２の作業領域８に記憶する（ステップ３２）。

続いて、リストア手段７は、ストリーミングテープ装置４を使用してリストア対象のファイル１３のファイル構成ブロック１２を順次読み出し、磁気ディスク装置３の空きブロック管理リスト１６に従って読み出したファイル構成ブロック１２を磁気ディスク装置３の空きブロック１５に順次書き込むとともに、ステップ３１にて読み出したバックアップ情報の対応するエントリの位置情報を書込みを行った空きブロック１５の位置情報に更新する（ステップ３３）。この際、ファイル構成ブロック１２が空きブロック管理リスト１６の位置情報順に整列されている空きブロック１５に順番に書き込まれるので、磁気ディスク装置３の書込みヘッドの移動時間が最小になり、このためストリーミングテープ装置４のストリーミング動作が可能になる確率が高まる。このファイル構成ブロック１２の読出しおよび書込みをファイル構成ブロック１２の終端を示すテープマークを読み出すまで繰り返し、テープマークを読み込んだ時点でストリーミングテープ装置４を停止させる。

次に、リストア手段７は、ステップ３３にて更新されたバックアップ情報をファイル１３上のファイル構成ブロック１２の順序番号をキーとして整列させる（ステップ３４）。

最後に、リストア手段７は、ステップ３１で読み込んだリストア対象のファイル１３のファイル情報ブロック１１をステップ３４にて順序番号順に整列させたバックアップ情報を使用して更新し、磁気ディスク装置３のファイル管理域９に書き込む（ステップ３５）。

以上で、ファイル１３のリストアが終了する。

〔発明の効果〕

以上説明したように本発明は、磁気ディスク装置からの読出しにおいて磁気ディスク装置の読出しヘッドの移動時間を最小にするようにファイル構成ブロックの読出しを位置情報順に行うようにしたことにより、磁気ディスク装置の読出しヘッドの移動時間を減らしてストリーミングテープ装置のストリーミング動作が可能になる確率を高めることができ、テープ上の記録の信頼性が向上するという効果がある。

4．図面の簡単な説明

第１図は本発明の一実施例に係るファイルのバックアップ方式が適用された計算機システムの構成を示すブロック図、

第２図は第１図中のバックアップ手段の処理を示す流れ図、

第３図は第１図中のリストア手段の処理を示す流れ図である。

図において、

１・・・計算機、

２・・・主記憶、

３・・・磁気ディスク装置、

４・・・ストリーミングテープ装置、

５・・・バックアッププログラム、

６・・・バックアップ手段、

７・・・リストア手段、

８・・・作業領域、

９・・・ファイル管理域、

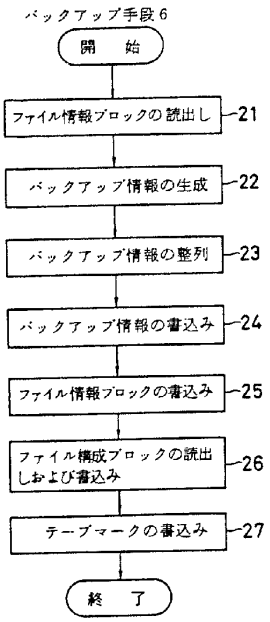
１０・・ファイルブロック域、

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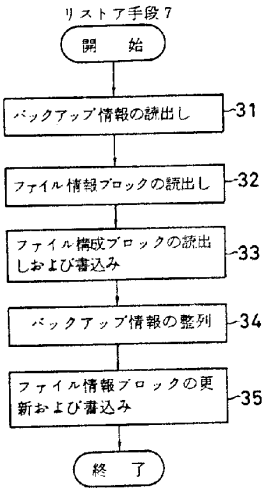
11・・ファイル情報ブロック、
12・・ファイル構成ブロック、
13・・ファイル、
14・・空きブロック情報ブロック、
15・・空きブロック、
16・・空きブロック管理リストである。

特許出願人　日本電気株式会社
代理人　弁理士　河原純一

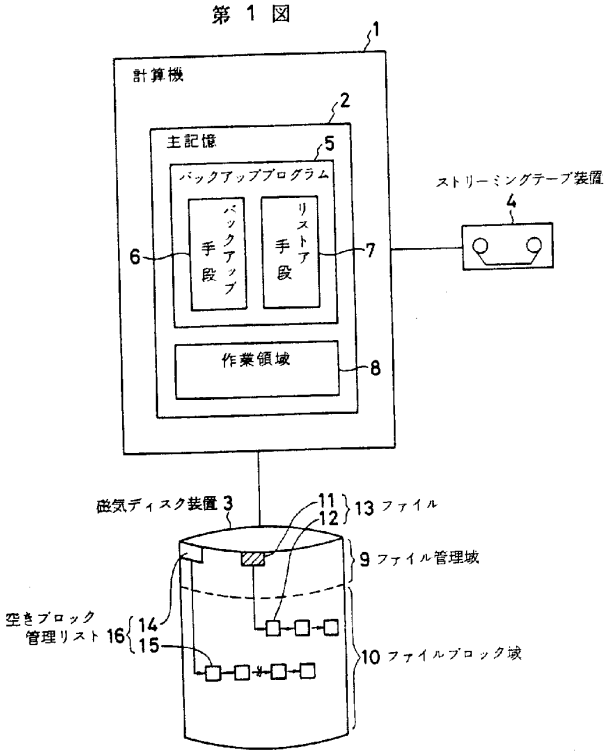
第2図



第3図



第1図



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Abstract of equivalent US 7072861 B1

PROBLEM TO BE SOLVED: To improve the serviceability of a system related to digital contents distribution through a network. SOLUTION: A purchaser 1a transmits information for designating digital contents and a transfer condition to a seller 3a through the network. The seller 3a reserves the network from a communication provider managing the network on the basis of the transfer condition. The seller 3a distributes the digital contents to the purchaser 1a through the network on the requested transfer condition. The seller 3a collects the charge of the digital contents including a high quality transfer fee from the purchaser 1a and pays the high quality transfer fee to the communication provider managing the network.

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				15/21	ＺＥＣＺ　５Ｂ０７５
	13/00	３５４			３３０　５Ｂ０８９
	17/30			15/40	３１０Ｆ　５Ｋ０３０
// Ｈ０４Ｌ	12/54		Ｈ０４Ｌ	11/20	１０１Ｚ

審査請求　未請求　請求項の数17　ＯＬ　（全 22 頁）　最終頁に続く

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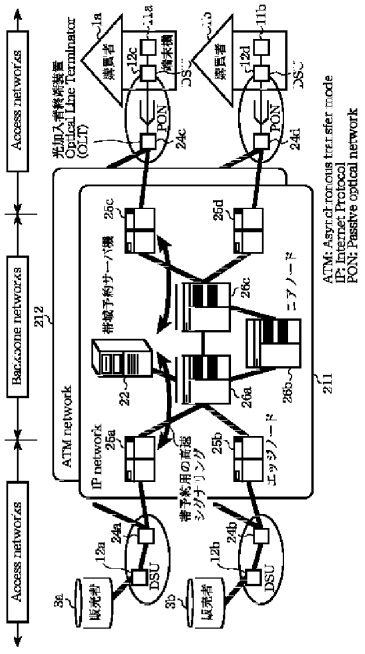
(22)出願日　平成11年12月15日(1999.12.15)

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最終頁に続く

(54)【発明の名称】　ネットワークによるデジタルコンテンツ配信システム

(57)【要約】
【課題】　ネットワークによるデジタルコンテンツの配信に係るシステムのサービス性を向上する。
【解決手段】　購買者１ａが、デジタルコンテンツを指定するための情報、転送条件をネットワークを介して、販売者３ａに送信する。販売者３ａは転送条件に基づき、ネットワークを管理する通信事業者にネットワークの予約を行う。販売者３ａは、ネットワークを介して、要求された転送条件でデジタルコンテンツを購買者１ａに配信する。販売者３ａは、購買者１ａから高品質転送料金を含んだデジタルコンテンツの料金を徴収し、ネットワークを管理している通信事業者に高品質転送料金を支払う。



【特許請求の範囲】
【請求項１】　ネットワークを介して音楽や映像、ゲームソフト等のデジタルコンテンツを配信するネットワークによるデジタルコンテンツ配信システムにおいて、
購買者は、所望のデジタルコンテンツを指定するための情報と、所望のデジタルコンテンツ転送条件とを、上記ネットワークを介して上記デジタルコンテンツの販売者に送信し、
上記販売者は、上記購買者からのデジタルコンテンツ転送条件に基づき、上記ネットワークを管理する通信事業者に上記ネットワークの予約を行い、
上記販売者は、上記購買者からの上記デジタルコンテンツ転送条件に基づき、上記ネットワークを介して上記所望のデジタルコンテンツを上記購買者に配信し、
上記販売者は、上記購買者から上記所望のデジタルコンテンツ転送条件に対応した転送料金を含んだ上記デジタルコンテンツの料金を徴収し、上記通信事業者に上記転送料金を支払うことを特徴とするネットワークによるデジタルコンテンツ配信システム。
【請求項２】　購買者が選択するデジタルコンテンツ転送条件は、至急配信、日付時間帯指定配信、日付指定配信等の時間条件であることを特徴とする請求項１記載のネットワークによるデジタルコンテンツ配信システム。
【請求項３】　通信事業者及びネットワークは複数で構成され、購買者が選択するデジタルコンテンツ転送条件は、上記複数のネットワークが個々に有する通信品質に対応していることを特徴とする請求項１記載のネットワークによるデジタルコンテンツ配信システム。
【請求項４】　通信品質はネットワークの転送速度（帯域）、遅延、遅延変動、バーストサイズ、セル間隔、セル廃棄の少なくとも１つであることを特徴とする請求項３記載のネットワークによるデジタルコンテンツ配信システム。
【請求項５】　購買者が選択するデジタルコンテンツ転送条件は、ネットワークの帯域を日時等の時間条件と共に予約するものであることを特徴とする請求項１記載のネットワークによるデジタルコンテンツ配信システム。
【請求項６】　購買者が選択するデジタルコンテンツ転送条件は、転送時間を保証するネットワーク帯域保証型と、転送時間を保証しないネットワーク帯域非保証型とがあり、かつデジタルコンテンツの上記転送時間が短いほど転送料金が高くなるよう設定したことを特徴とする請求項１記載のネットワークによるデジタルコンテンツ配信システム。
【請求項７】　販売者は、購買者からのデジタルコンテンツ転送条件でデジタルコンテンツを配信する前に、上記購買者の端末機がメモリ容量等、デジタルコンテンツの配信を受けられる能力があるか否かを、ネットワークを介して調べることを特徴とする請求項１記載のネットワークによるデジタルコンテンツ配信システム。
【請求項８】　ネットワークと購買者とを結ぶ通信回線は、通常の電話回線の他に、光ファイバケーブル、又は同軸ケーブル、又は無線回線のいずれか１つであることを特徴とする請求項１記載のネットワークによるデジタルコンテンツ配信システム。
【請求項９】　通信事業者が、販売者から送信される送信開始通知から、上記販売者から送信される送信終了通知までのデジタルコンテンツの転送時間を管理し、上記転送時間が所定の値を越えた場合に、上記販売者にタイムアウト通知を行い、
上記販売者が上記デジタルコンテンツの配信を強制終了することを特徴とする請求項１記載のネットワークによるデジタルコンテンツ配信システム。
【請求項１０】　販売者が、所望のデジタルコンテンツを暗号化して購買者に配信し、
上記購買者が暗号化された上記所望のデジタルコンテンツを復号化することを特徴とする請求項１記載のネットワークによるデジタルコンテンツ配信システム。
【請求項１１】　ネットワークを介して音楽や映像、ゲームソフト等のデジタルコンテンツを配信するネットワークによるデジタルコンテンツ配信システムにおいて、
上記デジタルコンテンツの販売者は、
購買者からの所望のデジタルコンテンツを指定するための情報と所望のデジタルコンテンツ転送条件とを受け取り、上記購買者からのデジタルコンテンツ転送条件に基づき、上記ネットワークを管理する通信事業者に上記ネットワークの予約を行い、上記通信事業者からの予約結果に基づき、上記ネットワークを介して上記所望のデジタルコンテンツを上記購買者に配信し、上記購買者への配信が完了後に、上記購買者から上記所望のデジタルコンテンツ転送条件に対応した転送料金を含んだ上記デジタルコンテンツの料金を受領し、上記通信事業者に上記転送料金を支払うことを特徴とするネットワークによるデジタルコンテンツ配信システム。
【請求項１２】　購買者からの所望のデジタルコンテンツを指定するための情報と所望のデジタルコンテンツ転送条件は、ネットワークを介して、又は通常の電話回線を介して販売者に与えられることを特徴とする請求項１１記載のネットワークによるデジタルコンテンツ配信システム。
【請求項１３】　ネットワークを介して音楽や映像、ゲームソフト等のデジタルコンテンツを配信するネットワークによるデジタルコンテンツ配信システムにおいて、
上記ネットワークを管理する通信事業者は、
上記デジタルコンテンツの販売者からのデジタルコンテンツ転送条件に基づき上記ネットワークの予約を行い、その予約結果を上記販売者に通知し、上記予約結果に基づき配信される上記販売者からのデジタルコンテンツを、上記予約されたネットワークを介して購買者の配信し、上記販売者から上記デジタルコンテンツ転送条件に

対応した転送料金を受領することを特徴とするネットワークによるデジタルコンテンツ配信システム。

【請求項14】 転送料金は、購入者が通信事業者に直接支払う回線使用料とは独立に、配信サービスの通信品質に対応した料金であることを特徴とする請求項13記載のネットワークによるデジタルコンテンツ配信システム。

【請求項15】 通信事業者は、販売者から送信される送信開始通知から、上記販売者から送信される送信終了通知までのデジタルコンテンツの転送時間を管理し、上記転送時間が所定の値を超えた場合に、上記販売者にタイムアウト通知を行い、上記デジタルコンテンツの配信を強制終了させることを特徴とする請求項13記載のネットワークによるデジタルコンテンツ配信システム。

【請求項16】 ネットワークを介して音楽や映像、ゲームソフト等のデジタルコンテンツを配信するネットワークによるデジタルコンテンツ配信システムにおいて、

上記デジタルコンテンツの販売者は、

購買者からの所望のデジタルコンテンツを指定するための情報と所望のデジタルコンテンツ転送条件と上記購買者の個人情報・支払い情報とを受け取り、上記購買者からのデジタルコンテンツ転送条件に基づき、上記ネットワークを管理する通信事業者に上記ネットワークの予約を行い、上記通信事業者からの予約結果に基づき、上記ネットワークを介して上記所望のデジタルコンテンツを上記購買者に配信し、金融機関による上記購買者の個人情報・支払い情報の認証結果に基づき、上記金融機関から上記所望のデジタルコンテンツ転送条件に対応した転送料金を含んだ上記デジタルコンテンツの料金を徴収し、上記通信事業者に上記転送料金を支払うことを特徴とするネットワークによるデジタルコンテンツ配信システム。

【請求項17】 購買者からの所望のデジタルコンテンツを指定するための情報と所望のデジタルコンテンツ転送条件と上記購買者の個人情報・支払い情報は、ネットワークを介して、又は通常の電話回線を介して販売者に与えられることを特徴とする請求項16記載のネットワークによるデジタルコンテンツ配信システム。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】この発明は、ネットワークを介して音楽や映像、ゲームソフト等のデジタルコンテンツを配信するネットワークによるデジタルコンテンツ配信システムに関するものである。

【0002】

【従来の技術】現在、通信網を使用したビジネスの世界では、「テクノロジー指向」から「サービス指向」へと変化しつつあり、特にマルチメディアを扱えて、かつ、通信品質と言われるＱｏＳ（Ｑｕａｌｉｔｙ ｏｆ Ｓｅｒｖｉｃｅ）を保証できる技術として、ＡＴＭ（Ａｓｙｎｃｈｒｏｎｏｕｓ Ｔｒａｎｓｆｅｒ Ｍｏｄｅ）が注目されている。適切なネットワーク管理能力を備えているＡＴＭネットワークは、ＩＰ（Ｉｎｔｅｒｎｅｔ Ｐｒｏｔｏｃｏｌ）やフレームリレー、音声等の多種多様なトラヒックを同時に取り扱うことができ、また、ＱｏＳの保証も容易に実現できることから、サービス差別化のための強力な武器になると言われている。

【0003】また、ネットワーク管理機能を利用できれば、ＶＢＲ（Ｖａｒｉａｂｌｅ Ｂｉｔ Ｒａｔｅ）や非リアルタイムサービスクラス等の各種ＱｏＳクラスを活用して、「テクノロジー指向」ではない「サービス品質指向」のネットワーク・ビジネスを展開できる。例えば、音声サービスを提供する際にも、単純なＣＢＲ（Ｃｏｎｓｔａｎｔ Ｂｉｔ Ｒａｔｅ）サービスの代わりに、効率の良い他のＱｏＳクラスを利用することが考えられる。ネットワーク管理のテクノロジーは、ルータやスイッチ等のハードウェア管理だけでなく、「サービス管理」の手段としても重要な役割を担う。

【0004】こうした厳格なサービス管理は、ＡＴＭネットワークが高度なＱｏＳ管理能力を備えていることにより可能となっている。ＡＴＭでは、個々のＶＣ（Ｖｉｒｔｕａｌ Ｃｉｒｃｕｉｔ）に対して、転送速度（帯域幅）、遅延、遅延変動、バースト・サイズ、セル間隔、セル廃棄率等のきめ細かなパラメータを設定し保証することができる。

【0005】ＡＴＭ Ｆｏｒｕｍでは、ＶＣの持ちうるＱｏＳ特性を分類し、４種類のサービス・クラス、すなわち、ＣＢＲ，ｒｔ（ｒｅａｌ ｔｉｍｅ）－ＶＢＲ，ｎｒｔ（ｎｏｎ－ｒｅａｌｔｉｍｅ）－ＶＢＲ，及びＡＢＲ（ＡｖａｉｒａｂｌｅＢｉｔ Ｒａｔｅ）／ＵＢＲ（Ｕｎｓｐｅｃｉｆｉｅｄ Ｂｉｔ Ｒａｔｅ）を規定している。

【0006】このように、サービス・クラスを分割することで、いずれかに輻輳が起こった場合でも、他のクラスへの影響を回避できる。例えば、ＡＴＭスイッチにバースト・トラヒックが集中したとしても、ＣＢＲクラスの音声や動画については安定した伝送が可能である。

【0007】また、ＡＴＭネットワークでは、デジタルコンテンツの配信による販売に係る課金処理も実現することが検討されている。公衆ネットワーク・サービスの競争力を維持するには、固定料金制ではなく、サービス品目や利用度に応じた課金を行う仕組みが必要である。例えば、ＣＢＲサービスは、ベスト・エフォート型のＵＢＲサービスよりも高い料金を設定するこが考えられている。このほか、利用する時間帯により異なる料金を設定したり、使用した帯域幅や利用時間に比例した課金等も提案されている。

【0008】このように、デジタルコンテンツの購買者は、提供するデジタルコンテンツの内容、即ち音楽や映画・地図情報等の映像やゲームソフト等の内容の他に、

実際に利用した配信サービスの品質や利用度に応じて料金を支払えば良く、購買者のネットワーク利用形態に密着した課金が可能になっている。

【０００９】

【発明が解決しようとする課題】従来のネットワークによるデジタルコンテンツ配信システムは、いかなるデジタルコンテンツを購入するかを中心にシステム構成されているので、通信路の品質を指定するのは販売者であり、デジタルコンテンツを購入する際には、購買者はデジタルコンテンツの販売者にアクセスし、デジタルコンテンツのデータ量の情報を入手して、それを通信事業者に申告して通信路を確保してから、再びデジタルコンテンツの販売者にアクセスし、直前に確保した通信路のチャネル等の情報を通知して、デジタルコンテンツを購入しなければならず、購入に係る一連の手続が複雑で煩わしさがあるという課題があった。

【００１０】また、購買者が転送時間の短い高品質転送によりデジタルコンテンツを購入する際に、購買者は、デジタルコンテンツの料金をデジタルコンテンツの販売者に支払うと共に、高品質転送料金を通信事業者に別個独立に支払わなければならず、支払いの手続に煩わしさがあるという課題があった。

【００１１】この発明は上記のような課題を解決するためになされたもので、ネットワークによるデジタルコンテンツの配信を希望する購買者は、希望するデジタルコンテンツ転送条件に応じた配信サービスを受けることができるネットワークによるデジタルコンテンツ配信システムを得ることを目的とする。

【００１２】

【課題を解決するための手段】この発明に係るネットワークによるデジタルコンテンツ配信システムは、ネットワークを介して音楽や映像、ゲームソフト等のデジタルコンテンツを配信するものにおいて、購買者は、所望のデジタルコンテンツを指定するための情報と、所望のデジタルコンテンツ転送条件とを、上記ネットワークを介して上記デジタルコンテンツの販売者に送信し、上記販売者は、上記購買者からのデジタルコンテンツ転送条件に基づき、上記ネットワークを管理する通信事業者に上記ネットワークの予約を行い、上記販売者は、上記購買者からの上記デジタルコンテンツ転送条件に基づき、上記ネットワークを介して上記所望のデジタルコンテンツを上記購買者に配信し、上記販売者は、上記購買者から上記所望のデジタルコンテンツ転送条件に対応した転送料金を含んだ上記デジタルコンテンツの料金を徴収し、上記通信事業者に上記転送料金を支払うものである。

【００１３】この発明に係るネットワークによるデジタルコンテンツ配信システムは、購買者が選択するデジタルコンテンツ転送条件が、至急配信、日付時間帯指定配信、日付指定配信等の時間条件であるものである。

【００１４】この発明に係るネットワークによるデジタルコンテンツ配信システムは、通信事業者及びネットワークは複数で構成され、購買者が選択するデジタルコンテンツ転送条件が、上記複数のネットワークが個々に有する通信品質に対応しているものである。

【００１５】この発明に係るネットワークによるデジタルコンテンツ配信システムは、通信品質がネットワークの転送速度（帯域）、遅延、遅延変動、バーストサイズ、セル間隔、セル廃棄の少なくとも１つであるものである。

【００１６】この発明に係るネットワークによるデジタルコンテンツ配信システムは、購買者が選択するデジタルコンテンツ転送条件は、ネットワークの帯域を日時等の時間条件と共に予約するものである。

【００１７】この発明に係るネットワークによるデジタルコンテンツ配信システムは、購買者が選択するデジタルコンテンツ転送条件が、転送時間を保証するネットワーク帯域保証型と、転送時間を保証しないネットワーク帯域非保証型とがあり、かつデジタルコンテンツの上記転送時間が短いほど転送料金が高くなるよう設定したものである。

【００１８】この発明に係るネットワークによるデジタルコンテンツ配信システムは、販売者が、購買者からのデジタルコンテンツ転送条件でデジタルコンテンツを配信する前に、上記購買者の端末機がメモリ容量等、デジタルコンテンツの配信を受けられる能力があるか否かを、ネットワークを介して調べるものである。

【００１９】この発明に係るネットワークによるデジタルコンテンツ配信システムは、ネットワークと購買者とを結ぶ通信回線が、通常の電話回線の他に、光ファイバケーブル、又は同軸ケーブル、又は無線回線のいずれか１つであるものである。

【００２０】この発明に係るネットワークによるデジタルコンテンツ配信システムは、通信事業者が、販売者から送信される送信開始通知から、上記販売者から送信される送信終了通知までのデジタルコンテンツの転送時間を管理し、上記転送時間が所定の値を越えた場合に、上記販売者にタイムアウト通知を行い、上記販売者が上記デジタルコンテンツの配信を強制終了するものである。

【００２１】この発明に係るネットワークによるデジタルコンテンツ配信システムは、販売者が、所望のデジタルコンテンツを暗号化して購買者に配信し、上記購買者が暗号化された上記所望のデジタルコンテンツを復号化するものである。

【００２２】この発明に係るネットワークによるデジタルコンテンツ配信システムは、ネットワークを介して音楽や映像、ゲームソフト等のデジタルコンテンツを配信するものにおいて、上記デジタルコンテンツの販売者は、購買者からの所望のデジタルコンテンツを指定するための情報と所望のデジタルコンテンツ転送条件とを受け取り、上記購買者からのデジタルコンテンツ転送条件

に基づき、上記ネットワークを管理する通信事業者に上記ネットワークの予約を行い、上記通信事業者からの予約結果に基づき、上記ネットワークを介して上記所望のデジタルコンテンツを上記購買者に配信し、上記購買者への配信が完了後に、上記購買者から上記所望のデジタルコンテンツ転送条件に対応した転送料金を含んだ上記デジタルコンテンツの料金を受領し、上記通信事業者に上記転送料金を支払うものである。

【００２３】この発明に係るネットワークによるデジタルコンテンツ配信システムは、購買者からの所望のデジタルコンテンツを指定するための情報と所望のデジタルコンテンツ転送条件が、ネットワークを介して、又は通常の電話回線を介して販売者に与えられるものである。

【００２４】この発明に係るネットワークによるデジタルコンテンツ配信システムは、ネットワークを介して音楽や映像、ゲームソフト等のデジタルコンテンツを配信するものにおいて、上記ネットワークを管理する通信事業者は、上記デジタルコンテンツの販売者からのデジタルコンテンツ転送条件に基づき上記ネットワークの予約を行い、その予約結果を上記販売者に通知し、上記予約結果に基づき配信される上記販売者からのデジタルコンテンツを、上記予約されたネットワークを介して購買者の配信し、上記販売者から上記デジタルコンテンツ転送条件に対応した転送料金を受領するものである。

【００２５】この発明に係るネットワークによるデジタルコンテンツ配信システムは、転送料金が、購入者が通信事業者に直接支払う回線使用料とは独立に、配信サービスの通信品質に対応した料金であるものである。

【００２６】この発明に係るネットワークによるデジタルコンテンツ配信システムは、通信事業者が、販売者から送信される送信開始通知から、上記販売者から送信される送信終了通知までのデジタルコンテンツの転送時間を管理し、上記転送時間が所定の値を超えた場合に、上記販売者にタイムアウト通知を行い、上記デジタルコンテンツの配信を強制終了させるものである。

【００２７】この発明に係るネットワークによるデジタルコンテンツ配信システムは、ネットワークを介して音楽や映像、ゲームソフト等のデジタルコンテンツを配信するものにおいて、上記デジタルコンテンツの販売者は、購買者からの所望のデジタルコンテンツを指定するための情報と所望のデジタルコンテンツ転送条件と上記購買者の個人情報・支払い情報とを受け取り、上記購買者からのデジタルコンテンツ転送条件に基づき、上記ネットワークを管理する通信事業者に上記ネットワークの予約を行い、上記通信事業者からの予約結果に基づき、上記ネットワークを介して上記所望のデジタルコンテンツを上記購買者に配信し、金融機関による上記購買者の個人情報・支払い情報の認証結果に基づき、上記金融機関から上記所望のデジタルコンテンツ転送条件に対応した転送料金を含んだ上記デジタルコンテンツの料金を徴収し、上記通信事業者に上記転送料金を支払うものである。

【００２８】この発明に係るネットワークによるデジタルコンテンツ配信システムは、購買者からの所望のデジタルコンテンツを指定するための情報と所望のデジタルコンテンツ転送条件と上記購買者の個人情報・支払い情報が、ネットワークを介して、又は通常の電話回線を介して販売者に与えられるものである。

【００２９】

【発明の実施の形態】以下、この発明の実施の一形態を説明する。

実施の形態１．図１はこの発明の実施の形態１におけるネットワークよるデジタルコンテンツ配信システムの構成を示す図であり、図において、１ａ，１ｂ，１ｃはデジタルコンテンツを購入する購買者、１１ａ，１１ｂ，１１ｃは購買者１ａ，１ｂ，１ｃがそれぞれ保有している端末機で、通常のインターネット機能を有するパソコン等である。２ａ，２ｂ，２ｃは、デジタルコンテンツを転送するネットワーク２１ａ，２１ｂ，２１ｃをそれぞれ管理している通信事業者、３ａ，３ｂはデジタルコンテンツとしての音楽や映像やゲームソフト等を販売する販売者、３１ａ，３１ｂは販売者３ａ，３ｂが保有しているサーバ機、４は、購買者１ａ，１ｂ，１ｃの認証を行うと共に、デジタルコンテンツの販売に係る課金処理を行う信販会社である。

【００３０】図２はこの発明の実施の形態１におけるネットワーク構成を示す図であり、特にアクセス系が光ネットワークで構成される図である。図において、１ａ，１ｂはデジタルコンテンツを購入する購買者、１１ａ，１１ｂは端末機、３ａ，３ｂはデジタルコンテンツを販売する販売者、２１１は、デジタルコンテンツを転送するネットワークのうち、ＩＰ（Ｉｎｔｅｒｎｅｔ Ｐｒｏｔｏｃｏｌ）を使用したＩＰネットワーク、２１２は、デジタルコンテンツを転送するネットワークのうち、ＡＴＭ（Ａｓｙｎｃｈｒｏｎｏｕｓ Ｔｒａｎｓｆｅｒ Ｍｏｄｅ）を使用したＡＴＭネットワークである。１２ａ，１２ｂ，１２ｃ，１２ｄはＤＳＵ（加入者線終端装置）、２４ａ，２４ｂ，２４ｃ，２４ｄは光加入者線を終端し通信事業者の局舎に設置された光加入者線終端装置（ＯＬＴ）、２２は帯域予約サーバ機、２５ａ，２５ｂ，２５ｃ，２５ｄはアクセス系からの情報をネットワーク内部に伝達するエッジノード、２６ａ，２６ｂ，２６ｃはバックボーンネットワーク内の情報を高速に振り分けるコアノードである。

【００３１】購買者のアクセス系ネットワークは、ＰＯＮ（Ｐａｓｓｉｖｅ ｏｐｔｉｃａｌ ｎｅｔｗｏｒｋ）で構成され、安価かつ高速な光ネットワークが構成されている。なお、ＰＯＮの概略は、ネットワーク側の光加入者線終端装置２４ｃ，２４ｄから購買者１ａ，１ｂへは、光ファイバ線の下りとして放送形式で情報を伝

送し、逆に複数の購買者１ａ，１ｂからの個別要求情報は、光ファイバ線の上りとして相互に個々のデータが衝突しないようタイムスロット等を個々に割り付けて伝送するよう構成されたものである。

【００３２】図３は購買者１ａが保有している端末機１１ａの構成を示すブロック図であり、図において、１１１は購入したデジタルコンテンツを格納する大容量の蓄積メディアで、音楽や映像、ゲームソフト等が光学的又は磁気的に記録・再生可能に記憶される。１１２は端末機１１ａ全体の処理を制御するＣＰＵ、１１３はＣＰＵ１２の実行のためのメモリ、１１５はデジタルコンテンツに施された暗号を復号化する暗号復号化回路、１１６はネットワークインタフェース、１１７は端末機１１ａ内のバスで、１２ａはネットワークインタフェース１１６と通信路を接続するＤＳＵ（Ｄｉｇｉｔａｌ　Ｓｅｒｖｉｃｅ　Ｕｎｉｔ；加入者線終端装置）である。

【００３３】ゲーム用コントローラＧａｃ機能を有する端末機１１ａは、通常のパソコンの周辺機器であるキーボードＫ／Ｂ，マウスＭａと、デジタルコンテンツ等を利用するためのホームテレビＴＶが表示器として接続されている。また、ＤＳＵ１２ａには、光ファイバケーブルや同軸ケーブル等の双方向通信路ＦＴＴＨが接続される。なお、購買者１ａには、通信路ＦＴＴＨの他に通常の電話回線の併設を妨げるものではない。

【００３４】図４は販売者３ａが保有しているサーバ機３１ａの構成を示すブロック図であり、図において、３１１は配信サービスを提供するためのデジタルコンテンツを格納している蓄積メディア、３１２はサーバ機３１ａ全体の処理を制御するＣＰＵ、３１３はＣＰＵ３１２の実行のためのメモリ、３１４は販売者３ａの顧客である購買者１ａ，１ｂ，１ｃの登録会員データベース、３１５は転送するデジタルコンテンツに暗号化を施す暗号化回路、３１６はネットワークインタフェース、３１７はサーバ機３１ａ内のバスで、３２ａはネットワークインタフェース３１６と光ファイバケーブルの通信路ＯＰＦＣを接続するＤＳＵである。

【００３５】なお、サーバ機３１ａには、通常のサーバとして必要な周辺機器であるキーボード操作卓Ｋ／Ｂ，マウスＭａや表示器ＣＲＴの他に、提供するデジタルコンテンツをモニタする複数のホームテレビＴＶが接続されている。また、通常の電話機ＴＥＬも配信サービス受信用に設けられている。

【００３６】次に動作について説明する。図５はこの発明の実施の形態１におけるネットワークによるデジタルコンテンツ配信システムの処理の流れを示すフローチャートである。また、図６はデジタルコンテンツが正常に配信販売される基本的な流れを示す図である。以下、デジタルコンテンツを配信希望する購買者１ａが配信を完了するまでの流れを図に示し説明する。図５のステップＳＴ１１において、購買者１ａの端末機１１ａがネットワーク２１ａ，２１ｂ，２１ｃを介して販売者３ａのサーバ機３１ａに接続すると、販売者３ａのサーバ機３１ａがデジタルコンテンツのジャンルメニューを購買者１ａの端末機１１ａに送信する。図７はジャンルメニューの表示画面の例を示す図である。

【００３７】ステップＳＴ１２において、購買者１ａが図７に示したジャンルメニューの表示画面の中から希望するジャンル、例えば「サイエンスフィクション」を指定して販売者３ａに送信すると、販売者３ａのサーバ機３１ａが「サイエンスフィクション」におけるコンテンツメニューを購買者１ａに送信する。図８はサイエンスフィクションのコンテンツメニューの表示画面の例を示す図である。

【００３８】ステップＳＴ１３において、購買者１ａが図８に示したサイエンスフィクションのコンテンツメニューの表示画面の中から希望するデジタルコンテンツ、例えば、「宇宙怪獣の逆襲」を指定して販売者３ａに送信すると、販売者３ａのサーバ機３１ａが「宇宙怪獣の逆襲」の転送条件（送信条件、以下同じ）を購買者１ａに送信する。

【００３９】図９は転送条件指定の表示画面の例を示す図である。図に示すように、短時間の転送時間（送信時間、以下同じ）を保証する帯域保証型と、転送時間を保証しない帯域非保証型のメニューが用意されている。ここで、ＣＢＲクラスは、各々のＶＣ（Ｖｉｒｔｕａｌ　Ｃｉｒｃｕｉｔ）に所定の帯域を日時等の時間条件と共に割り当てる方式であり、ＡＢＲクラスは、経路上の各回線やバッファに残存する帯域幅に応じて、個々のＶＣの伝送帯域を動的に調整する方式であり、ＵＢＲはＶＣの転送速度を一切指定できないサービス・クラスであり、回線やバッファにその時々に残存する帯域幅を利用してバースト転送を行う方式である。

【００４０】このように、転送条件指定は、複数のネットワークの通信品質に対応しており、ネットワークの転送速度（帯域）、遅延、遅延変動、バーストサイズ、セル間隔、セル廃棄等により通信品質が決まり、品質が高い程高い料金に設定されている。

【００４１】ステップＳＴ１４において、購買者１ａが図９に示した転送条件指定の表示画面の中から希望する転送条件を指定して販売者３ａに送信すると、販売者３ａのサーバ機３１ａが認証要求を購買者１ａに送信する。図１０は認証要求の表示画面の例を示す図である。なお、転送条件指定としては、至急配信、日付時間帯指定配信、日付指定配信等の時間条件がある。

【００４２】ステップＳＴ１５において、購買者１ａは図１０に示す認証要求の表示画面を使用して、ログインするための会員番号や支払い方法等の個人情報や支払い情報を指定して販売者３ａに送信すると、販売者３ａのサーバ機３１ａが信販会社４に認証問い合わせを行う。ステップＳＴ１６において、信販会社４は購買者１ａか

らの個人情報や支払い情報が正しいか否かを確認し、正しければ販売者３ａに認証完了通知を送信する。ステップＳＴ１７において、販売者３ａのサーバ機３１ａは、通信事業者２ｃ，２ｂ，２ａに、要求された転送条件で送信するための帯域予約を要求する。

【００４３】図１１は帯域予約の処理の流れの例を示す図であり、図において、２２ａ，２２ｂ，２２ｃは、ネットワーク２１ａ，２１ｂ，２１ｃにそれぞれ設置されている帯域予約サーバ機である。図に示すように、販売者３ａのサーバ機３１ａは、帯域予約サーバ機２２ｃ，２２ｂ，２２ａに対して、例えば、×月×日午後１０時から１０分間、１００Ｍｂ／ｓの転送速度で帯域予約が可能か否かを問い合わせたところ、帯域予約サーバ機２２ａ，２２ｂからは帯域予約が可能であるが、帯域予約サーバ機２２ｃからは帯域予約が不可能という通知がきたために、サーバ機３１ａは、図5のステップＳＴ２３において、購買者１ａの端末機１１ａに帯域予約が不可能で、希望するデジタルコンテンツを変更するか否かを購買者１ａに問い合わせる。

【００４４】そして、購買者１ａがデジタルコンテンツを変更しない場合には、ステップＳＴ１４において、購買者１ａが新たな転送条件を指定し、ステップＳＴ１５，ＳＴ１６の認証確認を行った後、ステップＳＴ１７において、図１１に示すように、サーバ機３１ａは帯域予約サーバ機２２ｃ，２２ｂ，２２ａに対して、午後１０時から１０分間、５０Ｍｂ／ｓの転送速度で帯域予約が可能か否かを問い合わせて、ステップＳＴ１８において、全てのサーバ機２２ａ，２２ｂ，２２ｃから帯域予約の完了通知を受け取る。

【００４５】ステップＳＴ１９において、販売者３ａのサーバ機３１ａは購買者１ａの端末機１１ａに送信開始通知を送信し、販売者３ａのサーバ機３１ａが要求されたデジタルコンテンツのデータを、図４に示す暗号化回路３１５により暗号化し、ネットワークインタフェース３１６，ＤＳＵ３２ａ，ネットワーク２１ｃ，２１ｂ，２１ａを介して、購買者１ａの端末機１１ａに送信する。全てのデジタルコンテンツのデータが送信されない場合は、図6に示すように、端末機１１ａがサーバ機３１ａに再送要求を行い、サーバ機３１ａが未送付のデジタルコンテンツのデータを送信する。

【００４６】なお、販売者３ａは、購買者１ａへの送信に先立ち、購買者１ａが希望するデジタルコンテンツの容量が購買者１ａの蓄積メディア１１１に十分収納可能な容量があるか否かをチェックする要求を先ず送信し、端末機１１ａより十分収納可能である旨の回答を受けた後に、デジタルコンテンツの配信を開始することが好ましい。さらに、販売者３ａのサーバ機３１ａは、端末機１１ａのその他の性能がデジタルコンテンツ配信を受け入れる能力があるか否かも事前にチェックすることが好ましい。

【００４７】ステップＳＴ２０において、端末機１１ａは要求したデジタルコンテンツが正常に送信されたか否かをチェックする。このとき、端末機１１ａは図３に示す暗号復号化回路１１５により、暗号化されたデジタルコンテンツを復号化し、蓄積メディア１１１に格納する。ステップＳＴ２０で正常に転送されなかった場合に、ステップＳＴ２３において、要求するデジタルコンテンツを変更するときにはステップＳＴ１２に戻り、デジタルコンテンツを変更しないときにはステップＳＴ１４に戻って、上記と同様の処理を行う。ステップＳＴ２０において、要求したデジタルコンテンツが正常に送信された場合には、販売者３ａのサーバ機３１ａは、ネットワーク２１ｃ，２１ｂ，２１ａの帯域予約サーバ機２２ｃ，２２ｂ，２２ａに送信完了通知を行う。

【００４８】ステップＳＴ２１において、販売者３ａのサーバ機３１ａは、信販会社４に課金要求を行い、信販会社４からの課金完了通知を購買者１ａの端末機１１ａに送信する。その後、信販会社４が購買者１ａの端末機１１ａに、デジタルコンテンツ自体の料金と高品質転送料金（高品質送信料金、以下同じ）を含めたデジタルコンテンツの料金請求書を送信し、端末機１１ａが信販会社４に入金処理して決済を行うと、信販会社４はデジタルコンテンツの料金を販売者３ａのサーバ機３１ａに送金する。

【００４９】ステップＳＴ２２において、販売者３ａが通信事業者２ｃ，２ｂ，２ａに対して高品質転送料金、すなわち、転送条件として帯域保証型を使用したことに対する料金の支払いを行う。この高品質転送料金は、単にネットワーク２１ａ，２１ｂ，２１ｃを使用したときの購買者１ａが通信事業者２ａ，２ｂ，２ｃに支払う回線使用料とは別個に支払うものである。

【００５０】図１２は信販会社４における認証が失敗したときの流れを示す図である。信販会社４が認証した結果、購買者１ａからの個人情報や支払い情報が誤っている場合に、信販会社４が販売者３ａのサーバ機３１ａに認証失敗通知を送信し、サーバ機３１ａが購買者１ａの端末機１１ａに認証失敗と再入力の要求を送信する。そして、購買者１ａが個人情報や支払い情報を再度送信し、販売者３ａが信販会社４に対して再度認証問い合わせを行う。そして、購買者１ａからの個人情報や支払い情報が再度誤っている場合に、信販会社４が販売者３ａのサーバ機３１ａに認証失敗通知を行い、サーバ機３１ａが購買者１ａの端末機１１ａに認証失敗通知を送信する。

【００５１】図１３はデジタルコンテンツのデータ送信が失敗した場合の流れを示す図である。サーバ機３１ａから端末機１ａに要求されたデジタルコンテンツのデータを送信しているときに、端末機１１ａの蓄積メディア１１１の容量不足等で受信に失敗すると、端末機１１ａはサーバ機３１ａに受信不能通知を送信し、サーバ機３

１ａはネットワーク２１ｃ，２１ｂ，２１ａに送信終了通知を行うと共に、端末機１１ａに受信未完了通知を送信する。

【００５２】以上のように、この実施の形態１によれば、購買者１ａがデジタルコンテンツ転送条件として、時間条件を選択することにより、急ぐデジタルコンテンツと急ぐ必要のないものとの差別化ができ、ネットワークの高負荷時に実時間性の問われないデジタルコンテンツの配信を避けることができる。また、ネットワークの通信品質に関係する転送速度（帯域）、遅延、遅延変動、バーストサイズ、セル間隔、セル廃棄等に応じた料金サービスが可能となるという効果が得られる。

【００５３】また、この実施の形態１によれば、購買者１ａがネットワーク２１ａ，２１ｂ，２１ｃを介して希望するデジタルコンテンツを購入する際に、デジタルコンテンツの転送条件を指定できると共に、信販会社４がデジタルコンテンツ自体の料金と高品質転送料金を一括して購買者１ａから徴収して販売者３ａに支払い、販売者３ａが通信事業者２ｃ，２ｂ，２ａに高品質転送料金を支払うことにより、購買者１ａは高品質転送料金を通信事業者２ａ，２ｂ，２ｃに支払う必要がなく、支払い処理を効率的に行うことができるという効果が得られる。

【００５４】さらに、この実施の形態１によれば、デジタルコンテンツ販売に際して、信販会社４が購買者１ａの認証を行ってから、販売者３ａがデジタルコンテンツを送信するので、確実な料金回収が行えるという効果が得られる。

【００５５】さらに、この実施の形態１によれば、デジタルコンテンツのデータ転送が失敗したことを販売者３ａが確認できるので、購買者１ａが転送失敗を証明する必要がないという効果が得られる。

【００５６】さらに、この実施の形態１によれば、販売者３ａのサーバ機３１ａがデジタルコンテンツのデータを暗号化してネットワーク２１ｃ，２１ｂ，２１ａを転送することにより、他のユーザが不正に抽出しにくいという効果が得られる。

【００５７】なお、実施の形態１の説明中、購買者１ａからの配信希望のデジタルコンテンツを指定するための情報や、デジタルコンテンツ転送条件や、個人情報、支払い情報を、通信路ＦＴＴＨを利用したものとして説明したが、図３，４に示した通常の電話ＴＥＬにてオペレータを介しても行うことができることは明白である。この場合、デジタルコンテンツの配信は、通信事業者からの予約結果に基づいて、デジタルコンテンツを購買者１ａに配信しても良い。

【００５８】さらに、ネットワーク２１ａと購買者１ａ，１ｂ，１ｃの端末機１１ａ，１１ｂ，１１ｃとを光ファイバケーブルＦＴＴＨで接続したものとして説明したが、同軸通信ケーブルや、これらケーブルと同等ないしそれ以上の能力を有する無線通信回線等も適宜利用しても良い。

【００５９】実施の形態２．図１４はこの発明の実施の形態２におけるネットワークによるデジタルコンテンツ配信システムの構成を示す図であり、図において、２３ａ，２３ｂ，２３ｃは、それぞれネットワーク２１ａ，２１ｂ，２１ｃに設置されている送信完了通知を待つタイマであり、その他は、実施の形態１の図１に示す構成と同等である。

【００６０】次に動作について説明する。図１５はこの発明の実施の形態２におけるネットワークによるデジタルコンテンツ配信システムの処理の流れを示すフローチャートである。また、図１６はデジタルコンテンツが正常に販売される基本的な流れを示す図である。以下、この発明の実施の形態２を、図に示し説明する。図１５におけるステップＳＴ１１～ＳＴ１８までの処理は、実施の形態１の図５におけるステップＳＴ１１～ＳＴ１８までの処理と同一である。

【００６１】ステップＳＴ１９において、販売者３ａのサーバ機３１ａから購買者１ａの端末機１１ａに送信開始通知を送信すると、ネットワーク２１ｃ，２１ｂ，２１ａに備えられているタイマ２３ｃ，２３ｂ，２３ａが起動する。このタイマ２３ｃ，２３ｂ，２３ａは、販売者３ａから購買者１ａに配信されるデジタルコンテンツの転送時間に対応して設定される。

【００６２】そして、図１５のステップＳＴ２０において、端末１ａがデジタルコンテンツのデータの受信完了後に、サーバ機３１ａからネットワーク２１ｃ，２１ｂ，２１ａに送信される送信完了通知により、タイマ２３ｃ，２３ｂ，２３ａがリセットされる。その後のステップＳＴ２１，ＳＴ２２の処理は、実施の形態１の図５におけるステップＳＴ２１，ＳＴ２２の処理と同一である。

【００６３】図１７はデジタルコンテンツのデータ転送がタイムアウトになる場合の処理の流れを示す図である。図１５のステップＳＴ１９において、販売者３ａのサーバ機３１ａが購買者１ａの端末機１１ａに送信開始通知を送信すると、ネットワーク２１ｃ，２１ｂ，２１ａに備えられているタイマ２３ｃ，２３ｂ，２３ａが起動する。

【００６４】図１５のステップＳＴ１９において、デジタルコンテンツのデータが送信され、ステップＳＴ２０において、データの転送に失敗し、再送要求をしてデジタルコンテンツのデータを転送する処理を何度も繰り返しているうちに、タイマ２３ｃ，２３ｂ，２３ａに設定されている時間がタイムアウトすると、図１５のステップＳＴ３１において、ネットワーク２１ａ，２１ｂ，２１ｃは、サーバ機３１ａにタイムアウトを通知して、サーバ機３１ａはデジタルコンテンツのデータ送信を強制終了し、端末機１１ａに転送失敗通知を行う。

【００６５】以上のように、この実施の形態２によれば、購買者１ａがネットワーク２１ａ，２１ｂ，２１ｃを介して希望するデジタルコンテンツを購入する際に、デジタルコンテンツの転送条件を指定できると共に、信販会社４がデジタルコンテンツ自体の料金と高品質転送料金を一括して購買者１ａから徴収して販売者３ａに支払い、販売者３ａが通信事業者２ｃ，２ｂ，２ａに高品質転送料金を支払うことにより、購買者１ａは高品質転送料金を通信事業者２ａ，２ｂ，２ｃに支払う必要がなく、支払い処理を効率的に行うことができるという効果が得られる。

【００６６】また、この実施の形態２によれば、販売者３ａのサーバ機３１ａから購買者１ａの端末機１１ａにデジタルコンテンツのデータを転送する転送時間が、所定の時間より長い場合には、ネットワーク２１ａ，２１ｂ，２１ｃに備えられているタイマ２３ａ，２３ｂ，２３ｃにより強制的に転送終了させることにより、ネットワーク２１ａ，２１ｂ，２１ｃの帯域を有効に使用できるという効果が得られる。

【００６７】さらに、この実施の形態２によれば、デジタルコンテンツ販売に際して、信販会社４が購買者１ａの認証を行ってから、販売者３ａがデジタルコンテンツを送信するので、確実な料金回収が行えるという効果が得られる。

【００６８】さらに、この実施の形態２によれば、デジタルコンテンツのデータ転送が失敗したことを、販売者３ａが確認できるので、購買者１ａが転送失敗を証明する必要がないという効果が得られる。

【００６９】さらに、この実施の形態２によれば、販売者３ａのサーバ機３１ａがデジタルコンテンツのデータを暗号化してネットワーク２１ｃ，２１ｂ，２１ａを転送することにより、他のユーザが不正に抽出しにくいという効果が得られる。

【００７０】実施の形態３．図１８はこの発明の実施の形態３におけるネットワークによるデジタルコンテンツ配信システムの構成を示す図であり、図において、５は、購買者１ａ，１ｂ，１ｃの認証を行うと共に、デジタルコンテンツの販売に係る課金処理を行う金融機関であり、その他は、実施の形態１の図１に示す構成と同等である。

【００７１】次に動作について説明する。図１９はこの発明の実施の形態３におけるネットワークによるデジタルコンテンツ配信システムの処理の流れを示すフローチャートである。また、図２０はデジタルコンテンツが正常に販売される基本的な流れを示す図である。図１９のステップＳＴ４０において、購買者１ａは金融機関５に入金を行う。ステップＳＴ４１～ＳＴ４４までの処理は、実施の形態１の図５におけるステップＳＴ１１～ＳＴ１４までの処理と同一である。

【００７２】ステップＳＴ４５において、購買者１ａは図１０に示す認証要求画面を使用し、ログインするための会員番号や支払い方法等の個人情報や支払い情報を指定して販売者３ａに送信すると、販売者３ａのサーバ機３１ａから金融機関５に認証問い合わせを行う。ステップＳＴ４６において、金融機関５は購買者１ａからの個人情報や支払い情報が正しいか否かを確認して、正しければ販売者３ａに認証完了通知を送信する。

【００７３】ステップＳＴ４７～ＳＴ５０までの処理は、実施の形態１の図５におけるステップＳＴ１７～ＳＴ２０までの処理と同一である。

【００７４】ステップＳＴ５０において、デジタルコンテンツが正常に送信された場合には、販売者３ａのサーバ機３１ａは、ネットワーク２１ｃ，２１ｂ，２１ａの帯域予約サーバ機２２ｃ，２２ｂ，２２ａに送信完了通知を行う。ステップＳＴ５１において、販売者３ａのサーバ機３１ａは、金融機関５に課金要求を行い、金融機関５からの課金完了通知を購買者１ａの端末機１１ａに送信し、金融機関５は高品質転送料金を含めたデジタルコンテンツの料金を販売者３ａのサーバ機３１ａに送金する。

【００７５】ステップＳＴ５２において、販売者が通信事業者２ｃ，２ｂ，２ａに対して高品質転送料金、すなわち、転送条件として帯域保証型を使用したことに対する料金の支払いを行う。この高品質転送料金は、単にネットワーク２１ａ，２１ｂ，２１ｃを使用したときの購買者１ａが通信事業者２ａ，２ｂ，２ｃに支払う回線使用料とは別個に支払うものである。

【００７６】図２１はデジタルコンテンツのデータ送信が失敗した場合の流れを示す図である。サーバ機３１ａが端末機１１ａにデジタルコンテンツのデータを送信しているときに、端末機１１ａの蓄積メディア１１１の容量不足等により受信に失敗すると、端末機１１ａはサーバ機３１ａに受信不能通知を送信し、サーバ機３１ａはネットワーク２１ｃ，２１ｂ，２１ａに送信終了通知を行うと共に、端末機１１ａに受信未完了通知を送信する。

【００７７】以上のように、この実施の形態３によれば、購買者１ａがネットワーク２１ａ，２１ｂ，２１ｃを介して希望するデジタルコンテンツを購入する際に、デジタルコンテンツの転送条件を指定できると共に、金融機関５がデジタルコンテンツ自体の料金と高品質転送料金を一括して販売者３ａに支払い、販売者３ａが通信事業者２ｃ，２ｂ，２ａに高品質転送料金を支払うことにより、購買者１ａは高品質転送料金を通信事業者２ａ，２ｂ，２ｃに支払う必要がなく、支払い処理を効率的に行うことができるという効果が得られる。

【００７８】また、この実施の形態３によれば、デジタルコンテンツ販売に際して、購買者１ａが予め入金している金融機関５の認証を行ってから、販売者３ａがデジタルコンテンツを送信するので、確実な料金回収が行え

るという効果が得られる。

【００７９】さらに、この実施の形態３によれば、デジタルコンテンツのデータ転送が失敗したことを、販売者３ａが確認できるので、購買者１ａが転送失敗を証明する必要がないという効果が得られる。

【００８０】さらに、この実施の形態３によれば、販売者３ａのサーバ機３１ａがデジタルコンテンツのデータを暗号化してネットワーク２１ｃ，２１ｂ，２１ａを転送することにより、他のユーザが不正に抽出しにくいという効果が得られる。

【００８１】さらに、この実施の形態３によれば、実施の形態２に示すように、ネットワーク２１ａ，２１ｂ，２１ｃにタイマ２３ａ，２３ｂ，２３ｃを備えていれば、販売者３ａのサーバ機３１ａから購買者１ａの端末機１１ａにデジタルコンテンツのデータを転送する転送時間が、所定の時間より長い場合には、タイマ２３ａ，２３ｂ，２３ｃにより強制的に転送終了させることにより、ネットワーク２１ａ，２１ｂ，２１ｃの帯域を有効に使用できるという効果が得られる。

【００８２】実施の形態４．この実施の形態４におけるネットワークによるデジタルコンテンツ配信システムの構成は、実施の形態３の図１８に示す構成と同一である。

【００８３】次に動作について説明する。図２２はこの発明の実施の形態４におけるネットワークによるデジタルコンテンツ配信システムの処理の流れを示すフローチャートである。また、図２３はデジタルコンテンツが正常に販売される基本的な流れを示す図である。図２２におけるステップＳＴ４０～ＳＴ４８までの処理は、実施の形態３の図１９におけるステップＳＴ４０～ＳＴ４８までの処理と同一である。

【００８４】ステップＳＴ４８において、帯域予約ができ、ネットワーク２１ａ，２１ｂ，２１ｃから帯域予約完了通知を受けた場合に、ステップＳＴ６１において、販売者３ａのサーバ機３１ａから金融機関５に振り込み要求を行い、金融機関５は販売者３ａにデジタルコンテンツ料金を振り込んで送金完了通知を行う。そして、販売者３ａは購買者１ａの端末機１１ａに振り込み完了通知を行う。

【００８５】ステップＳＴ４９において、販売者３ａのサーバ機３１ａが購買者１ａの端末機１１ａに送信開始通知に転送番号を付与して送信し、販売者３ａのサーバ機３１ａが要求されたデジタルコンテンツのデータを、図４に示す暗号化回路３１５により暗号化し、ネットワーク２１ｃ，２１ｂ，２１ａを介して購買者１ａの端末機１１ａに送信する。ここで、送信開始通知に付与される転送番号は、デジタルコンテンツのデータ送信ができなかった場合の管理に使用される。

【００８６】ステップＳＴ５０において、端末機１１ａは要求したデジタルコンテンツが正常に送信されたか否かをチェックする。このときに、端末機１１ａは図３に示す暗号復号化回路１１５により、暗号化されたデジタルコンテンツを復号化し、蓄積メディア１１１に格納する。ステップＳＴ５０において、正常に転送されなかった場合には、ステップＳＴ４２に戻り上記と同様の処理を行う。

【００８７】ステップＳＴ５０において、要求したデジタルコンテンツが正常に送信された場合に、購買者１ａの端末機１１ａが販売者３ａのサーバ機３１ａに受信完了通知を送信する。販売者３ａのサーバ機３１ａは、ネットワーク２１ｃ，２１ｂ，２１ａの帯域予約サーバ機２２ｃ，２２ｂ，２２ａに送信完了通知を行う。ステップＳＴ５２において、販売者３ａが通信事業者２ｃ，２ｂ，２ａに対して高品質転送料金の支払いを行う。

【００８８】図２４はデジタルコンテンツのデータ送信が失敗したときの処理の流れを示す図である。デジタルコンテンツのデータ送信が失敗したときには、購買者１ａの端末機１１ａが販売者３ａのサーバ機３１ａに受信不能通知を送信する。販売者３ａのサーバ機３１ａは、ネットワーク２１ｃ，２１ｂ，２１ａの帯域予約サーバ機２２ｃ，２２ｂ，２２ａに送信終了通知を行い、金融機関５に対して返金処理を行う。金融機関５は販売者３ａのサーバ機３１ａに返金完了通知を行い、販売者３ａのサーバ機３１ａは、購買者１ａの端末機１１ａに送信未完了と返金通知を行う。

【００８９】図２５及び図２６はデジタルコンテンツのデータ送信が失敗したときの処理の流れを示す図である。デジタルコンテンツのデータ送信が失敗したときは、図２５に示すように、購買者１ａの端末機１１ａが販売者３ａのサーバ機３１ａに受信不能通知を送信する。販売者３ａのサーバ機３１ａは、ネットワーク２１ｃ，２１ｂ，２１ａの帯域予約サーバ機２２ｃ，２２ｂ，２２ａに送信終了通知を行い、販売者３ａのサーバ機３１ａは、購買者１ａの端末機１１ａに対して、送信未完了通知と今回の転送番号による再送要求を促すメッセージを送信する。

【００９０】図２６において、送信に失敗したデジタルコンテンツとは別のジャンル指定、コンテンツ指定、転送条件指定が行われ、購買者１ａの端末機１１ａが販売者３ａのサーバ機３１ａから認証要求を受けると、会員番号や支払い方法等の個人情報や支払い情報と、前回使用した転送番号をサーバ機３１ａに送信する。そして、販売者３ａのサーバ機３１ａとネットワーク２１ｃ，２１ｂ，２１ａとの間で、帯域予約要求と帯域予約完了通知が送受信されると、販売者３ａのサーバ機３１ａが購買者１ａの端末機１１ａに、送信開始通知に新転送番号を付与して送信する。以下の処理は、図２３に示す処理と同一である。

【００９１】このように、図２５及び図２６では、デジタルコンテンツのデータ送信に失敗したときに、別のデ

ジタルコンテンツを送信する処理を示しているが、要求した各デジタルコンテンツに対応する転送番号を、販売者３ａのサーバ機３１ａと購買者１ａの端末機１１ａとの間で送受信することにより、転送前に金融機関５より振り込まれたデジタルコンテンツの料金で別のデジタルコンテンツを送信するようにしている。このとき、差額が発生した場合には、金融機関５と販売者３ａ間との決済が行われる。

【００９２】以上のように、この実施の形態４によれば、購買者１ａがネットワーク２１ａ，２１ｂ，２１ｃを介して希望するデジタルコンテンツを購入する際に、デジタルコンテンツの転送条件を指定できると共に、金融機関５がデジタルコンテンツ自体の料金と高品質転送料金を一括して販売者３ａに支払い、販売者３ａが通信事業者２ｃ，２ｂ，２ａに高品質転送料金を支払うことにより、購買者１ａは高品質転送料金を通信事業者２ａ，２ｂ，２ｃに支払う必要がなく、支払い処理を効率的に行うことができるという効果が得られる。

【００９３】また、この実施の形態４によれば、デジタルコンテンツ販売に際して、販売者３ａは、購買者１ａが予め入金している金融機関５の認証を行い、金融機関５よりデジタルコンテンツの料金を受け取ってから、デジタルコンテンツを転送することにより、より確実に料金回収が行えると共に、デジタルコンテンツの転送に失敗したとしても、事前に受け取った料金で要求された別のデジタルコンテンツを送信し、差額を決済できるので、料金回収処理を簡素化することができるという効果が得られる。

【００９４】さらに、この実施の形態４によれば、デジタルコンテンツのデータ転送が失敗したことを、販売者３ａが確認できるので、購買者１ａが転送失敗を証明する必要がないという効果が得られる。

【００９５】さらに、この実施の形態４によれば、販売者３ａのサーバ機３１ａがデジタルコンテンツのデータを暗号化してネットワーク２１ｃ，２１ｂ，２１ａを転送することにより、他のユーザが不正に抽出しにくいという効果が得られる。

【００９６】さらに、この実施の形態４によれば、実施の形態２に示すように、ネットワーク２１ａ，２１ｂ，２１ｃにタイマ２３ａ，２３ｂ，２３ｃを備えていれば、販売者３ａのサーバ機３１ａから購買者１ａの端末機１１ａにデジタルコンテンツのデータを転送する転送時間が、所定の時間より長い場合には、タイマ２３ａ，２３ｂ，２３ｃにより強制的に転送終了させることにより、ネットワーク２１ａ，２１ｂ，２１ｃの帯域を有効に使用できるという効果が得られる。

【００９７】

【発明の効果】以上のように、この発明によれば、購買者は、所望のデジタルコンテンツを指定するための情報と、所望のデジタルコンテンツ転送条件とを、ネットワークを介してデジタルコンテンツの販売者に送信し、販売者は、購買者からのデジタルコンテンツ転送条件に基づき、ネットワークを管理する通信事業者にネットワークの予約を行い、販売者は、購買者からのデジタルコンテンツ転送条件に基づき、ネットワークを介して所望のデジタルコンテンツを購買者に配信し、販売者は、購買者から所望のデジタルコンテンツ転送条件に対応した転送料金を含んだデジタルコンテンツの料金を徴収し、通信事業者に転送料金を支払うことにより、デジタルコンテンツ転送条件に対応したサービスが可能となると共に、購買者は転送料金を通信事業者に支払う必要がなく、支払い処理を効率的に行うことができるという効果がある。

【００９８】この発明によれば、購買者が選択するデジタルコンテンツ転送条件は、至急配信、日付時間帯指定配信、日付指定配信等の時間条件であることにより、急ぐデジタルコンテンツと急ぐ必要のないものとの差別化ができ、ネットワークの高負荷時に実時間性の問われないデジタルコンテンツの配信を避けることができるという効果がある。

【００９９】この発明によれば、通信事業者及びネットワークは複数で構成され、購買者が選択するデジタルコンテンツ転送条件は、複数のネットワークが個々に有する通信品質に対応していることにより、通信品質に応じた料金サービスが可能となるという効果がある。

【０１００】この発明によれば、通信品質はネットワークの転送速度（帯域）、遅延、遅延変動、バーストサイズ、セル間隔、セル廃棄の少なくとも１つであることにより、通信品質に応じた料金サービスが可能となるという効果がある。

【０１０１】この発明によれば、購買者が選択するデジタルコンテンツ転送条件は、ネットワークの帯域を日時等の時間条件と共に予約するものであることにより、購買者の要求品質を満たしたサービスを実現できるという効果がある。

【０１０２】この発明によれば、購買者が選択するデジタルコンテンツ転送条件は、転送時間を保証するネットワーク帯域保証型と、転送時間を保証しないネットワーク帯域非保証型とがあり、かつデジタルコンテンツの転送時間が短いほど転送料金が高くなるよう設定したことにより、通信品質に応じた料金サービスが可能となるという効果がある。

【０１０３】この発明によれば、販売者は、購買者からのデジタルコンテンツ転送条件でデジタルコンテンツを配信する前に、購買者の端末機がメモリ容量等、デジタルコンテンツの配信を受けられる能力があるか否かを、ネットワークを介して調べることにより、ネットワークの帯域を有効に使用できるという効果がある。

【０１０４】この発明によれば、ネットワークと購買者とを結ぶ通信回線は、通常の電話回線の他に、光ファイ

バケーブル、又は同軸ケーブル、又は無線回線のいずれか1つであることにより、高品質の料金サービスが可能となるという効果がある。

【0105】この発明によれば、通信事業者が、販売者から送信される送信開始通知から、販売者から送信される送信終了通知までのデジタルコンテンツの転送時間を管理し、転送時間が所定の値を越えた場合に、販売者にタイムアウト通知を行い、販売者がデジタルコンテンツの配信を強制終了することにより、ネットワークの帯域を有効に使用できるという効果がある。

【0106】この発明によれば、販売者が、所望のデジタルコンテンツを暗号化して購買者に配信し、購買者が暗号化された所望のデジタルコンテンツを復号化することにより、他のユーザが不正に抽出しにくいという効果がある。

【図面の簡単な説明】

【図1】　この発明の実施の形態1におけるネットワークによるデジタルコンテンツ配信システムの構成を示す図である。

【図2】　この発明の実施の形態1におけるネットワーク構成を示す図である。

【図3】　この発明の実施の形態1における購買者が保有している端末機の構成を示すブロック図である。

【図4】　この発明の実施の形態1における販売者が保有しているサーバ機の構成を示すブロック図である。

【図5】　この発明の実施の形態1におけるネットワークによるデジタルコンテンツ配信システムの処理の流れを示すフローチャートである。

【図6】　この発明の実施の形態1におけるデジタルコンテンツが正常に販売される基本的な流れを示す図である。

【図7】　この発明の実施の形態1におけるジャンルメニューの表示画面の例を示す図である。

【図8】　この発明の実施の形態1におけるサイエンスフィクションのコンテンツメニューの表示画面の例を示す図である。

【図9】　この発明の実施の形態1における転送条件指定の表示画面の例を示す図である。

【図10】　この発明の実施の形態1における認証要求の表示画面の例を示す図である。

【図11】　この発明の実施の形態1における帯域予約の処理の流れの例を示す図である。

【図12】　この発明の実施の形態1における信販会社における認証が失敗したときの流れを示す図である。

【図13】　この発明の実施の形態1におけるデジタルコンテンツのデータ送信が失敗した場合の流れを示す図である。

【図14】　この発明の実施の形態2におけるネットワークによるデジタルコンテンツ配信システムの構成を示す図である。

【図15】　この発明の実施の形態2におけるネットワークによるデジタルコンテンツ配信システムの処理の流れを示すフローチャートである。

【図16】　この発明の実施の形態2におけるデジタルコンテンツが正常に販売される基本的な流れを示す図である。

【図17】　この発明の実施の形態2におけるデジタルコンテンツのデータ転送がタイムアウトになる場合の処理の流れを示す図である。

【図18】　この発明の実施の形態3におけるネットワークによるデジタルコンテンツ配信システムの構成を示す図である。

【図19】　この発明の実施の形態3におけるネットワークによるデジタルコンテンツ配信システムの処理の流れを示すフローチャートである。

【図20】　この発明の実施の形態3におけるデジタルコンテンツが正常に販売される基本的な流れを示す図である。

【図21】　この発明の実施の形態3におけるデジタルコンテンツのデータ送信が失敗した場合の流れを示す図である。

【図22】　この発明の実施の形態4におけるネットワークによるデジタルコンテンツ配信システムの処理の流れを示すフローチャートである。

【図23】　この発明の実施の形態4におけるデジタルコンテンツが正常に販売される基本的な流れを示す図である。

【図24】　この発明の実施の形態4におけるデジタルコンテンツのデータ送信が失敗したときの処理の流れを示す図である。

【図25】　この発明の実施の形態4におけるデジタルコンテンツのデータ送信が失敗したときの処理の流れを示す図である。

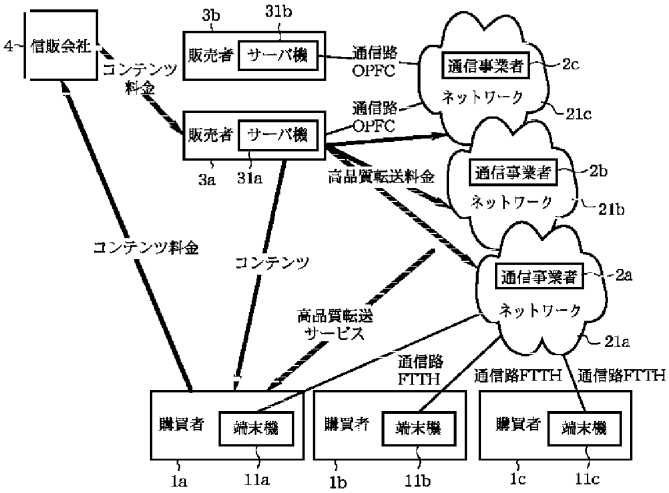
【図26】　この発明の実施の形態4におけるデジタルコンテンツのデータ送信が失敗したときの処理の流れを示す図である。

【符号の説明】

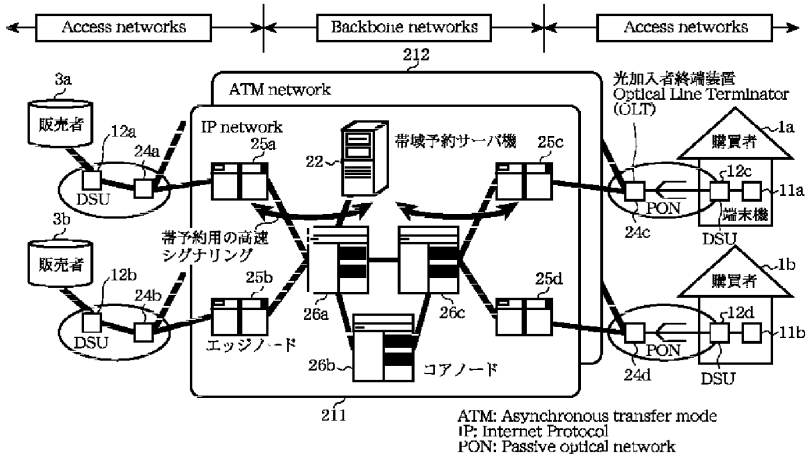
1a，1b，1c　購買者、2a，2b，2c　通信事業者、3a，3b　販売者、4　信販会社、5　金融機関、11a，11b，11c　端末機、12aDSU、21a，21b，21c　ネットワーク、22a，22b，22c帯域予約サーバ機、23a，23b，23c　タイマ、24a，24b，24c，24d　光加入者線終端装置、25a，25b，25c，25d　エッジノード、26a，26b，26c　コアノード、31a，31b　サーバ機、32aDSU、111　蓄積メディア、112　CPU、113　メモリ、115暗号復号化回路、116　ネットワークインタフェース、117　バス、211IPネットワーク、212　ATMネットワーク、311　蓄積メディア、312　CP

Ｕ、３１３　メモリ、３１４　登録会員データベース、　　ース。
３１５　暗号化回路、３１６　ネットワークインタフェ

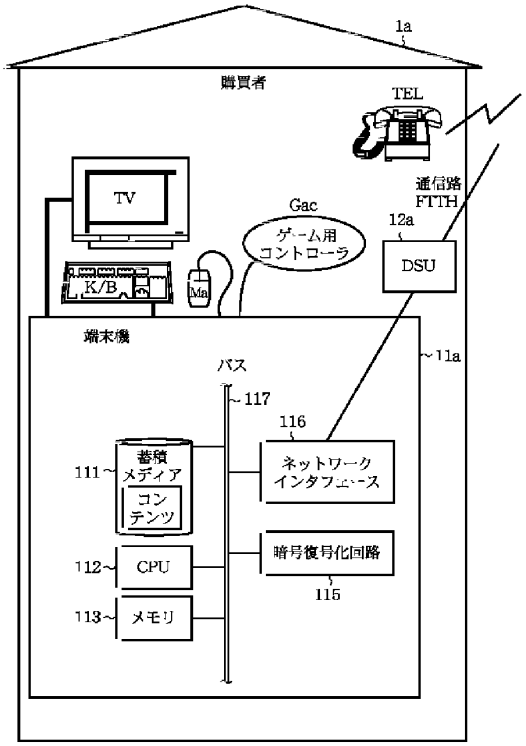
【図１】



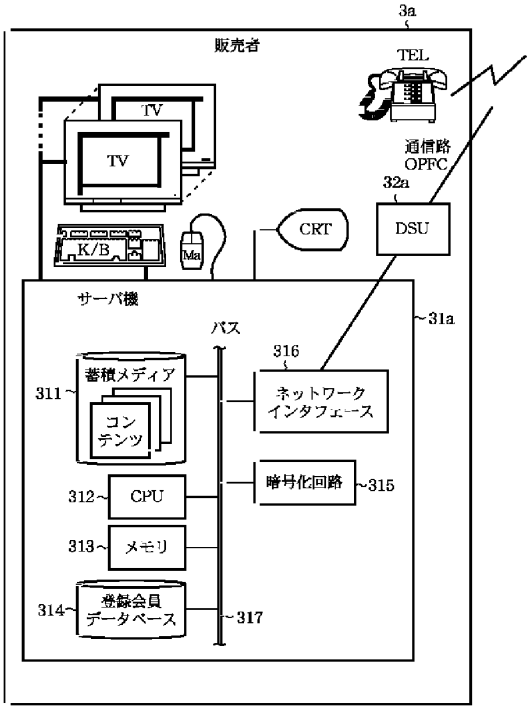
【図２】



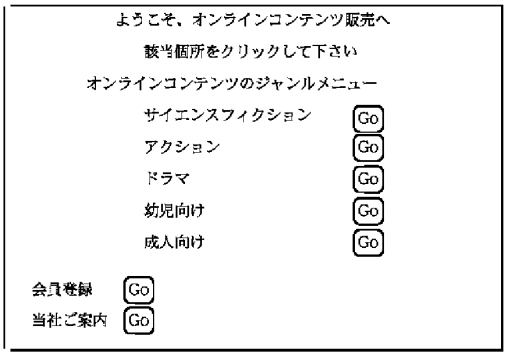
【図3】


1a
購買者
TEL
TV
通信路
FTTH
Gac
ゲーム用
コントローラ
12a
DSU
K/B
Ma
端末機
~11a
バス
~117
116
ネットワーク
インタフェース
111~
蓄積
メディア
コン
テンツ
112~
CPU
暗号復号化回路
115
113~
メモリ

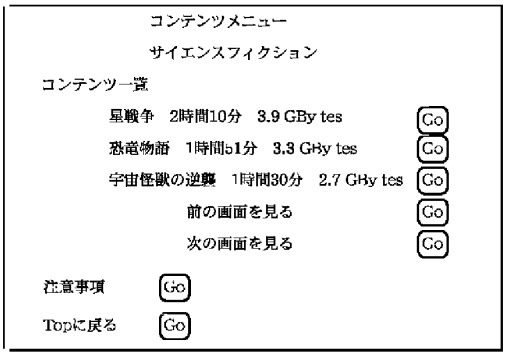
【図4】


3a
販売者
TEL
TV
TV
通信路
OPFC
32a
CRT
DSU
K/B
Ma
サーバ機
~31a
バス
316
311~
蓄積メディア
コン
テンツ
ネットワーク
インタフェース
暗号化回路
~315
312~
CPU
313~
メモリ
314~
登録会員
データベース
~317

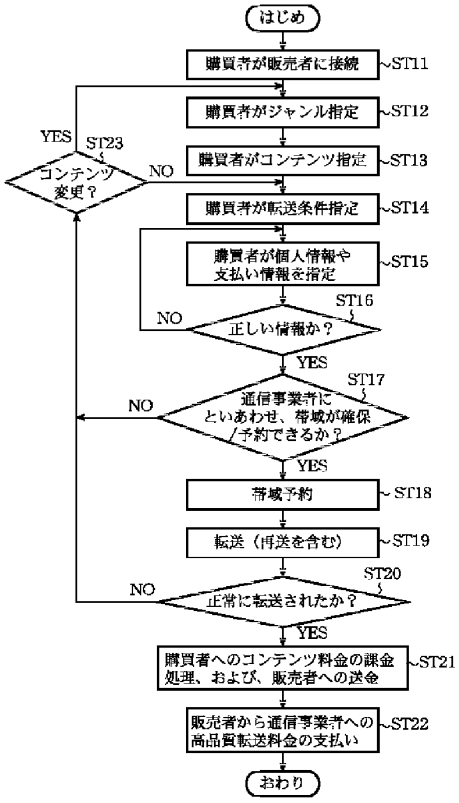
【図7】


ようこそ、オンラインコンテンツ販売へ
該当個所をクリックして下さい
オンラインコンテンツのジャンルメニュー
サイエンスフィクション Go
アクション Go
ドラマ Go
幼児向け Go
成人向け Go
会員登録 Go
当社ご案内 Go

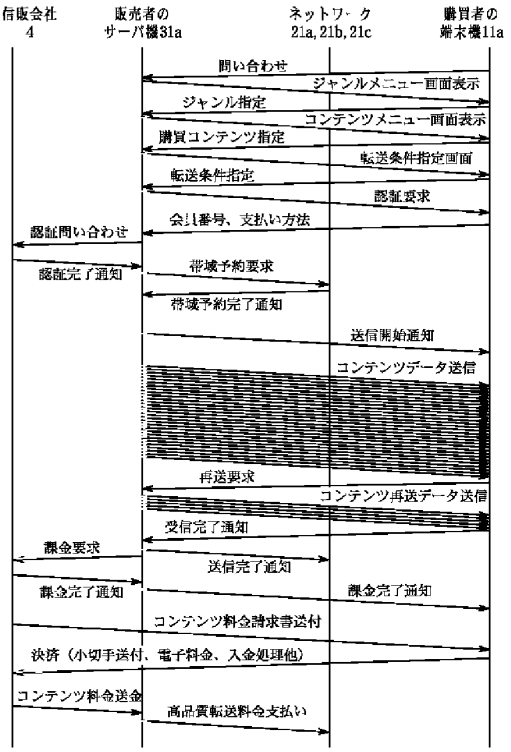
【図8】


コンテンツメニュー
サイエンスフィクション
コンテンツ一覧
星戦争 2時間10分 3.9 GBy tes Go
恐竜物語 1時間51分 3.3 GBy tes Go
宇宙怪獣の逆襲 1時間30分 2.7 GBy tes Go
前の画面を見る Go
次の画面を見る Go
注意事項 Go
Topに戻る Go

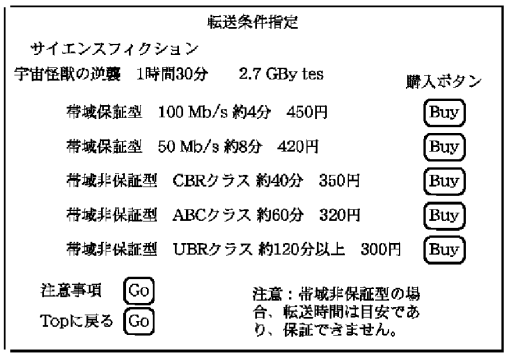
【図５】


はじめ
購買者が販売者に接続
ST11
購買者がジャンル指定
ST12
購買者がコンテンツ指定
ST13
購買者が転送条件指定
ST14
購買者が個人情報や支払い情報を指定
ST15
正しい情報か？
ST16
通信事業者にといあわせ、帯域が確保/予約できるか？
ST17
帯域予約
ST18
転送（再送を含む）
ST19
正常に転送されたか？
ST20
購買者へのコンテンツ料金の課金処理、および、販売者への送金
ST21
販売者から通信事業者への高品質転送料金の支払い
ST22
おわり
コンテンツ変更？
ST23
YES
NO

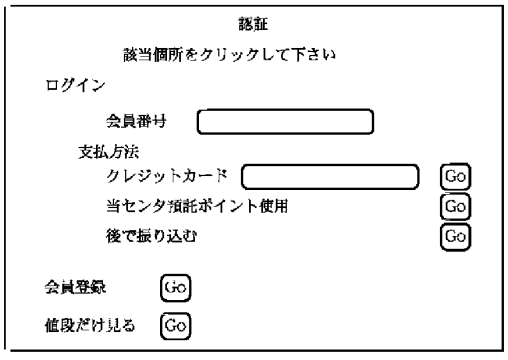
【図６】


信販会社 4
販売者のサーバ機31a
ネットワーク 21a, 21b, 21c
購買者の端末機11a
問い合わせ
ジャンルメニュー画面表示
ジャンル指定
コンテンツメニュー画面表示
購買コンテンツ指定
転送条件指定画面
転送条件指定
認証要求
会員番号、支払い方法
認証問い合わせ
認証完了通知
帯域予約要求
帯域予約完了通知
送信開始通知
コンテンツデータ送信
再送要求
コンテンツ再送データ送信
受信完了通知
課金要求
送信完了通知
課金完了通知
課金完了通知
コンテンツ料金請求書送付
決済（小切手送付、電子料金、入金処理他）
コンテンツ料金送金
高品質転送料金支払い

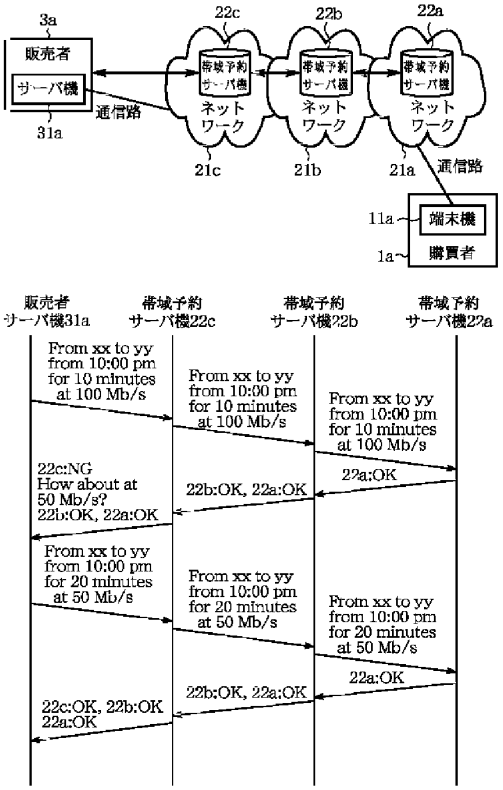
【図９】


転送条件指定
サイエンスフィクション
宇宙怪獣の逆襲 1時間30分 2.7 GBy tes
購入ボタン
帯域保証型 100 Mb/s 約4分 450円 Buy
帯域保証型 50 Mb/s 約8分 420円 Buy
帯域非保証型 CBRクラス 約40分 350円 Buy
帯域非保証型 ABCクラス 約60分 320円 Buy
帯域非保証型 UBRクラス 約120分以上 300円 Buy
注意事項 Go
Topに戻る Go
注意：帯域非保証型の場合、転送時間は目安であり、保証できません。

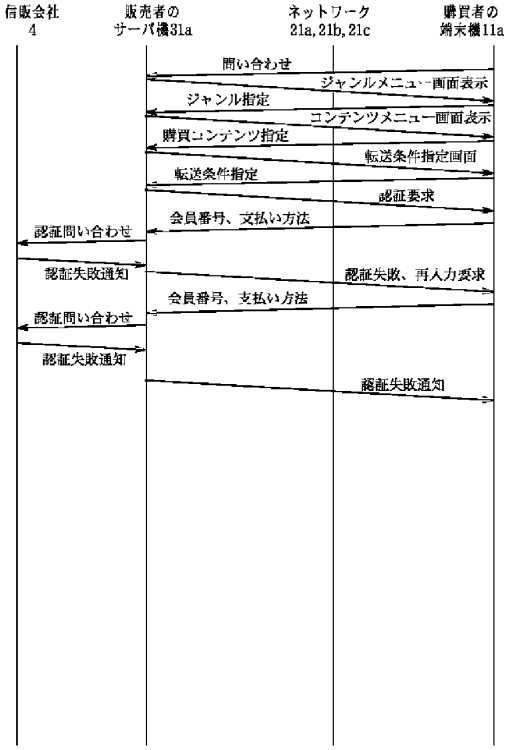
【図１０】


認証
該当個所をクリックして下さい
ログイン
会員番号
支払方法
クレジットカード Go
当センタ預託ポイント使用 Go
後で振り込む Go
会員登録 Go
値段だけ見る Go

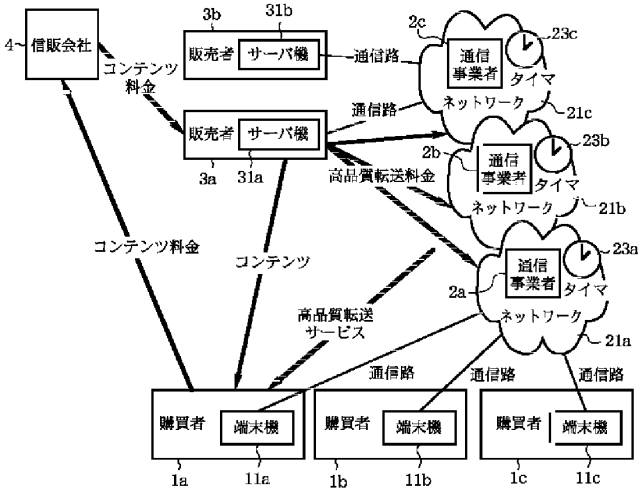
【図11】


3a
販売者
サーバ機
31a
通信路
22c
22b
22a
帯域予約サーバ機
ネットワーク
21c
21b
21a
通信路
11a
端末機
1a
購買者
販売者サーバ機31a
帯域予約サーバ機22c
帯域予約サーバ機22b
帯域予約サーバ機22a
From xx to yy from 10:00 pm for 10 minutes at 100 Mb/s
22c:NG How about at 50 Mb/s? 22b:OK, 22a:OK
22b:OK, 22a:OK
22a:OK
From xx to yy from 10:00 pm for 20 minutes at 50 Mb/s
22c:OK, 22b:OK 22a:OK

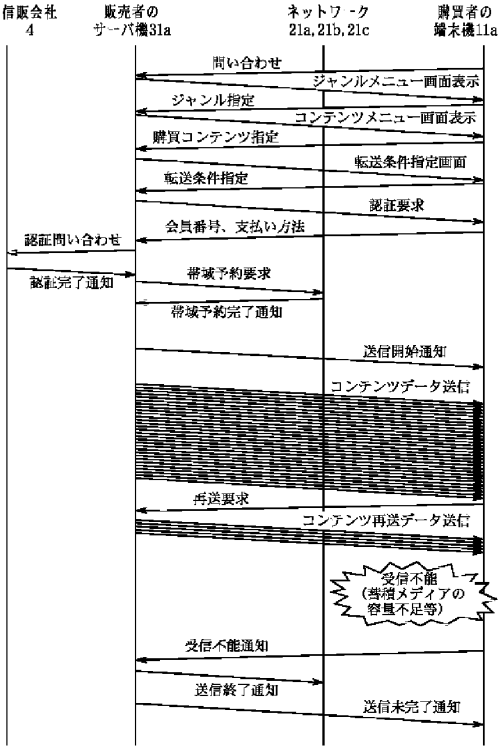
【図12】


信販会社 4
販売者のサーバ機31a
ネットワーク 21a, 21b, 21c
購買者の端末機11a
問い合わせ
ジャンルメニュー画面表示
ジャンル指定
コンテンツメニュー画面表示
購買コンテンツ指定
転送条件指定画面
転送条件指定
認証要求
会員番号、支払い方法
認証問い合わせ
認証失敗通知
認証失敗、再入力要求
会員番号、支払い方法
認証問い合わせ
認証失敗通知
認証失敗通知

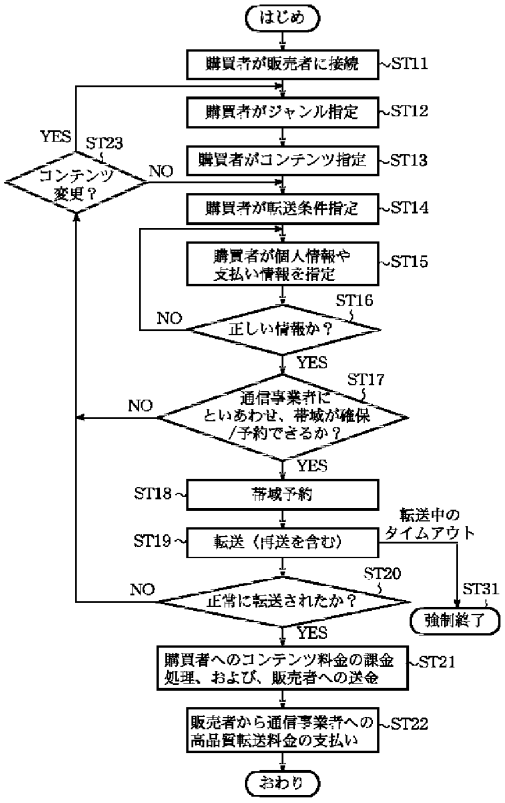
【図14】


4 信販会社
コンテンツ料金
3b 31b
販売者 サーバ機
通信路
2c
通信事業者
タイマ
23c
ネットワーク
21c
通信路
販売者 サーバ機
3a 31a
2b
通信事業者
タイマ
23b
高品質転送料金
ネットワーク
21b
コンテンツ料金
コンテンツ
通信事業者
タイマ
23a
2a
高品質転送サービス
ネットワーク
21a
通信路
通信路
通信路
購買者 端末機
1a 11a
購買者 端末機
1b 11b
購買者 端末機
1c 11c

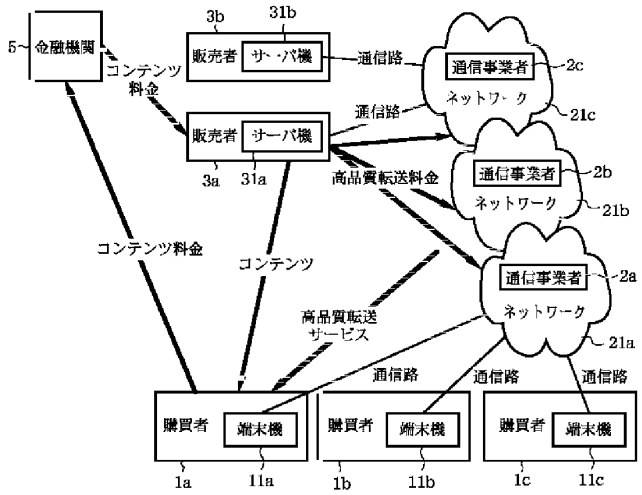
【図１３】


信販会社
4
販売者の
サーバ機31a
ネットワーク
21a,21b,21c
購買者の
端末機11a
問い合わせ
ジャンルメニュー画面表示
ジャンル指定
コンテンツメニュー画面表示
購買コンテンツ指定
転送条件指定画面
転送条件指定
認証要求
会員番号、支払い方法
認証問い合わせ
認証完了通知
帯域予約要求
帯域予約完了通知
送信開始通知
コンテンツデータ送信
再送要求
コンテンツ再送データ送信
受信不能
(蓄積メディアの
容量不足等)
受信不能通知
送信終了通知
送信未完了通知

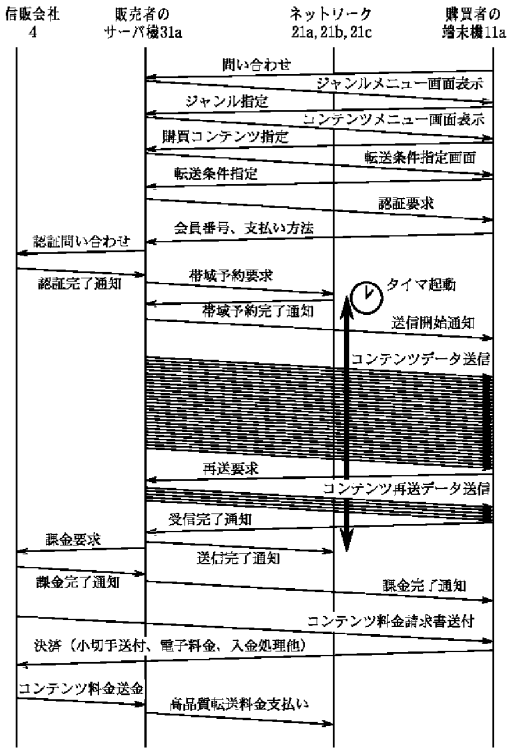
【図１５】


はじめ
購買者が販売者に接続
ST11
購買者がジャンル指定
ST12
YES
ST23
コンテンツ
変更？
NO
購買者がコンテンツ指定
ST13
購買者が転送条件指定
ST14
購買者が個人情報や
支払い情報を指定
ST15
ST16
NO
正しい情報か？
YES
ST17
NO
通信事業者に
といあわせ、帯域が確保
/予約できるか？
YES
ST18
帯域予約
転送中の
タイムアウト
ST19
転送（再送を含む）
ST20
NO
正常に転送されたか？
ST31
強制終了
YES
購買者へのコンテンツ料金の課金
処理、および、販売者への送金
ST21
販売者から通信事業者への
高品質転送料金の支払い
ST22
おわり

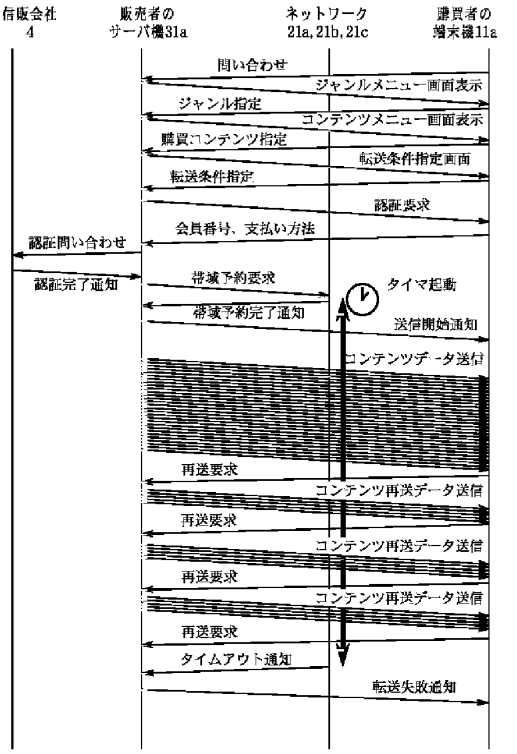
【図１８】


5
金融機関
コンテンツ
料金
3b
31b
販売者
サーバ機
通信路
通信事業者
2c
ネットワーク
21c
販売者
サーバ機
通信路
3a
31a
高品質転送料金
通信事業者
2b
ネットワーク
21b
コンテンツ料金
コンテンツ
通信事業者
2a
ネットワーク
21a
高品質転送
サービス
通信路
通信路
通信路
購買者
端末機
購買者
端末機
購買者
端末機
1a
11a
1b
11b
1c
11c

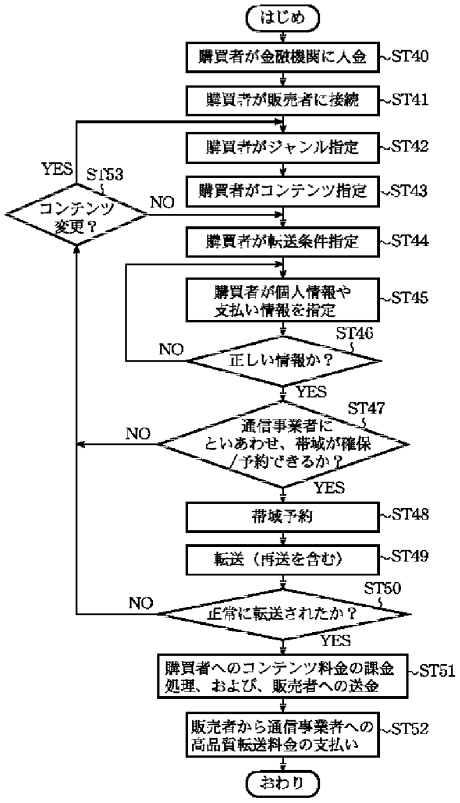
【図１６】


信販会社
4
販売者の
サーバ機31a
ネットワーク
21a, 21b, 21c
購買者の
端末機11a
問い合わせ
ジャンルメニュー画面表示
ジャンル指定
コンテンツメニュー画面表示
購買コンテンツ指定
転送条件指定画面
転送条件指定
認証要求
会員番号、支払い方法
認証問い合わせ
認証完了通知
帯域予約要求
タイマ起動
帯域予約完了通知
送信開始通知
コンテンツデータ送信
再送要求
コンテンツ再送データ送信
受信完了通知
課金要求
送信完了通知
課金完了通知
課金完了通知
コンテンツ料金請求書送付
決済（小切手送付、電子料金、入金処理他）
コンテンツ料金送金
商品質転送料金支払い

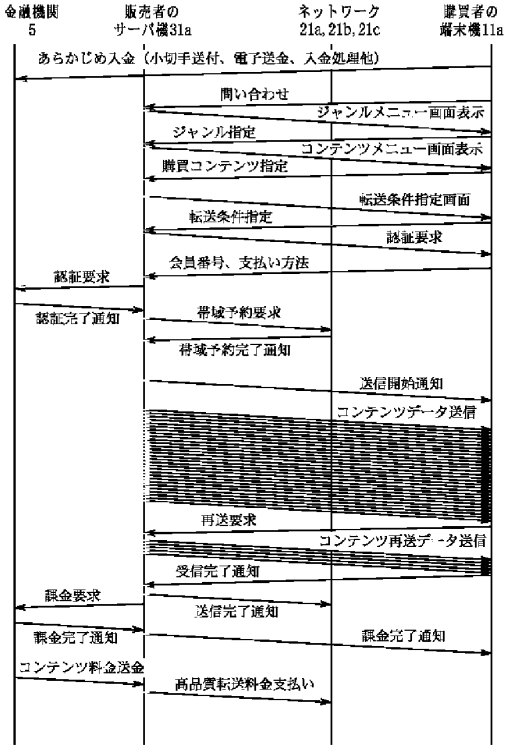
【図１７】


信販会社
4
販売者の
サーバ機31a
ネットワーク
21a, 21b, 21c
購買者の
端末機11a
問い合わせ
ジャンルメニュー画面表示
ジャンル指定
コンテンツメニュー画面表示
購買コンテンツ指定
転送条件指定画面
転送条件指定
認証要求
会員番号、支払い方法
認証問い合わせ
認証完了通知
帯域予約要求
タイマ起動
帯域予約完了通知
送信開始通知
コンテンツデータ送信
再送要求
コンテンツ再送データ送信
再送要求
コンテンツ再送データ送信
再送要求
コンテンツ再送データ送信
再送要求
タイムアウト通知
転送失敗通知

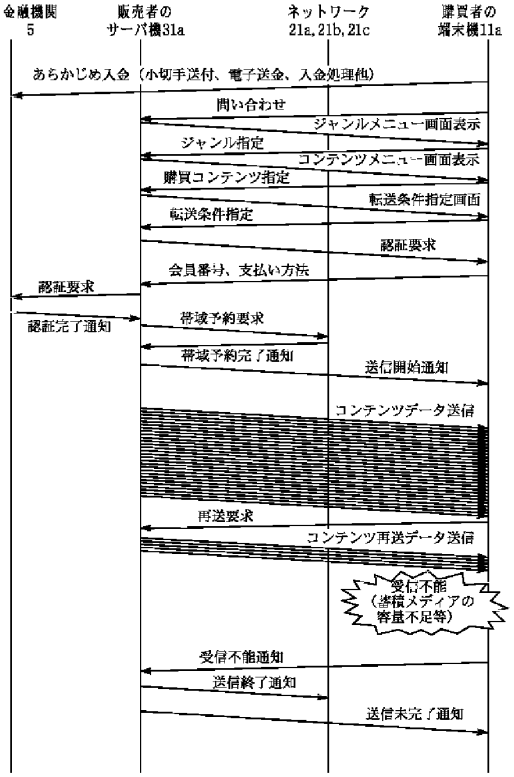
【図１９】


はじめ
購買者が金融機関に入金
ST40
購買者が販売者に接続
ST41
購買者がジャンル指定
ST42
購買者がコンテンツ指定
ST43
購買者が転送条件指定
ST44
購買者が個人情報や支払い情報を指定
ST45
正しい情報か？
ST46
通信事業者にといあわせ、帯域が確保／予約できるか？
ST47
帯域予約
ST48
転送（再送を含む）
ST49
正常に転送されたか？
ST50
購買者へのコンテンツ料金の課金処理、および、販売者への送金
ST51
販売者から通信事業者への高品質転送料金の支払い
ST52
おわり
コンテンツ変更？
ST53
YES
NO

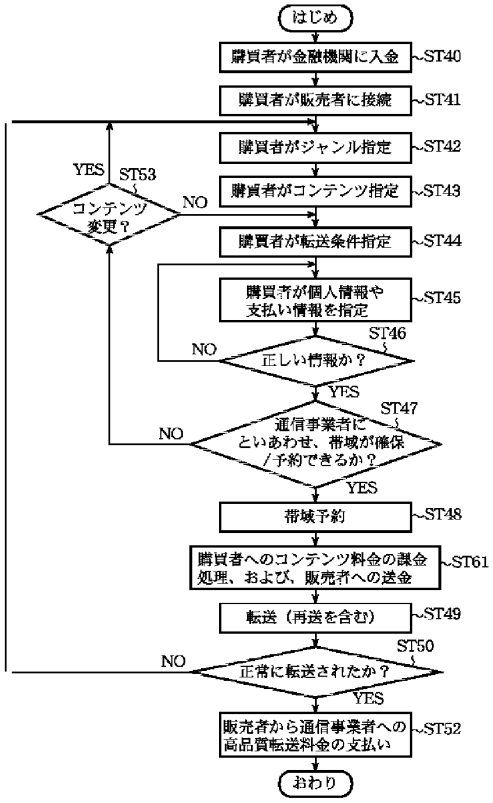
【図２０】


金融機関 5
販売者のサーバ機31a
ネットワーク 21a, 21b, 21c
購買者の端末機11a
あらかじめ入金（小切手送付、電子送金、入金処理他）
問い合わせ
ジャンルメニュー画面表示
ジャンル指定
コンテンツメニュー画面表示
購買コンテンツ指定
転送条件指定画面
転送条件指定
認証要求
会員番号、支払い方法
認証要求
認証完了通知
帯域予約要求
帯域予約完了通知
送信開始通知
コンテンツデータ送信
再送要求
コンテンツ再送データ送信
受信完了通知
課金要求
送信完了通知
課金完了通知
課金完了通知
コンテンツ料金送金
高品質転送料金支払い

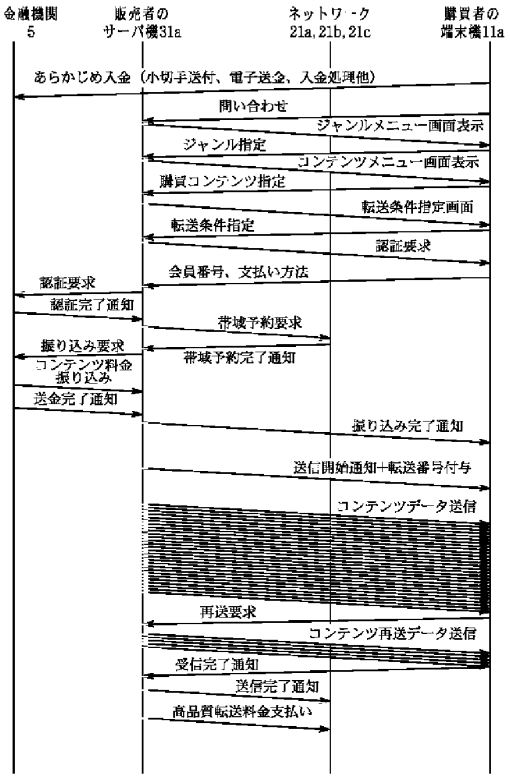
【図２１】


金融機関
5
販売者の
サーバ機31a
ネットワーク
21a, 21b, 21c
購買者の
端末機11a
あらかじめ入会（小切手送付、電子送金、入金処理他）
問い合わせ
ジャンルメニュー画面表示
ジャンル指定
コンテンツメニュー画面表示
購買コンテンツ指定
転送条件指定画面
転送条件指定
認証要求
会員番号、支払い方法
認証要求
認証完了通知
帯域予約要求
帯域予約完了通知
送信開始通知
コンテンツデータ送信
再送要求
コンテンツ再送データ送信
受信不能
（蓄積メディアの
容量不足等）
受信不能通知
送信終了通知
送信未完了通知

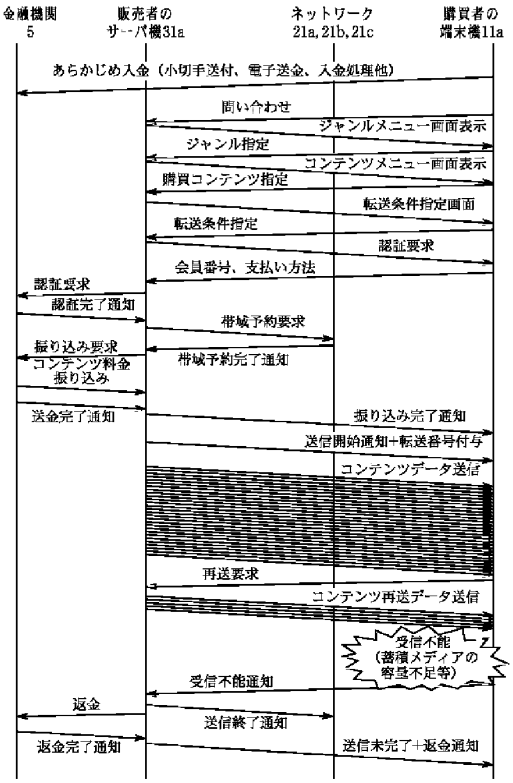
【図２２】


はじめ
購買者が金融機関に入金
ST40
購買者が販売者に接続
ST41
購買者がジャンル指定
ST42
購買者がコンテンツ指定
ST43
購買者が転送条件指定
ST44
購買者が個人情報や
支払い情報を指定
ST45
正しい情報か？
ST46
通信事業者に
といあわせ、帯域が確保
／予約できるか？
ST47
帯域予約
ST48
購買者へのコンテンツ料金の課金
処理、および、販売者への送金
ST61
転送（再送を含む）
ST49
正常に転送されたか？
ST50
販売者から通信事業者への
高品質転送料金の支払い
ST52
おわり
コンテンツ
変更？
ST53
YES
NO
YES
NO
YES
NO
YES
NO

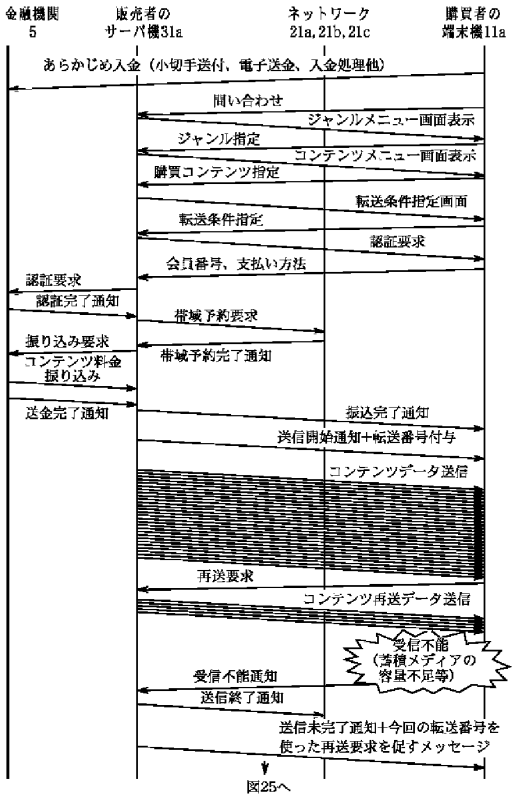
【図２３】


金融機関
5
販売者の
サーバ機31a
ネットワーク
21a,21b,21c
購買者の
端末機11a
あらかじめ入金（小切手送付、電子送金、入金処理他）
問い合わせ
ジャンルメニュー画面表示
ジャンル指定
コンテンツメニュー画面表示
購買コンテンツ指定
転送条件指定画面
転送条件指定
認証要求
会員番号、支払い方法
認証要求
認証完了通知
帯域予約要求
振り込み要求
帯域予約完了通知
コンテンツ料金
振り込み
送金完了通知
振り込み完了通知
送信開始通知＋転送番号付与
コンテンツデータ送信
再送要求
コンテンツ再送データ送信
受信完了通知
送信完了通知
高品質転送料金支払い

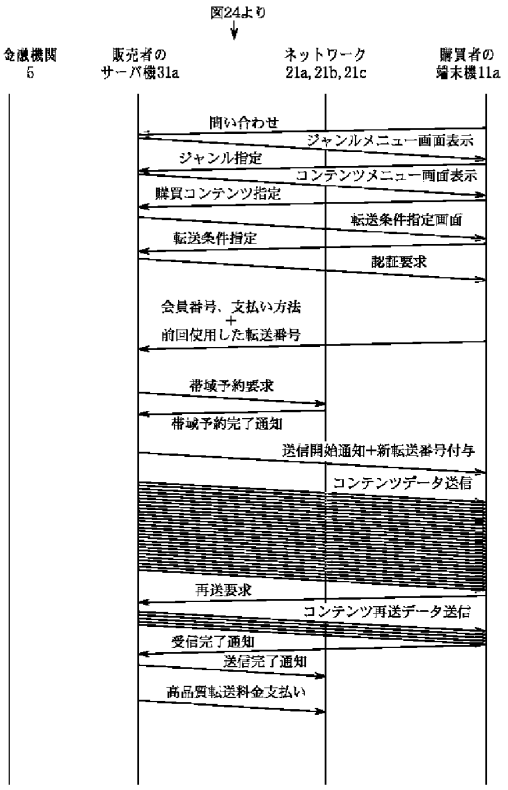
【図２４】


金融機関
5
販売者の
サーバ機31a
ネットワーク
21a,21b,21c
購買者の
端末機11a
あらかじめ入金（小切手送付、電子送金、入金処理他）
問い合わせ
ジャンルメニュー画面表示
ジャンル指定
コンテンツメニュー画面表示
購買コンテンツ指定
転送条件指定画面
転送条件指定
認証要求
会員番号、支払い方法
認証要求
認証完了通知
帯域予約要求
振り込み要求
帯域予約完了通知
コンテンツ料金
振り込み
送金完了通知
振り込み完了通知
送信開始通知＋転送番号付与
コンテンツデータ送信
再送要求
コンテンツ再送データ送信
受信不能
（蓄積メディアの
容量不足等）
受信不能通知
返金
送信終了通知
返金完了通知
送信未完了＋返金通知

【図25】



【図26】



フロントページの続き

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LB25
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Abstract of equivalent US 20040248561 A1

A system, method and apparatus that enables end user (402) of mobile terminal (430) to establish primary content channel (426) having primary content feedback provided via path (434). In response, User Interface (UI) logic block (404) detects the primary content channel selection and queries media channel controller (406) for secondary content channel selections that may be instantiated in response to the primary content channel selection. Secondary media channel (428) is automatically established upon an affirmative match made between parameters contained within database (408) and characteristics associated with the primary media channel selection.

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(54) 매체 콘텐트 채널들을 용이하게 하는 시스템, 방법 및 장치

(57) 요약

이동 단말기(430)의 최종 사용자(402)가 경로(434)를 통해 제공된 제1 콘텐트 피드백을 가지는 제1 콘텐트 채널(426)을 설정할 수 있는 시스템, 방법 및 장치가 개시된다. 응답하여, 사용자 인터페이스(UI) 로직 블록(404)은 제1 콘텐트 채널 선택을 검출하고, 제1 콘텐트 채널 선택에 응답하여 인스턴스화될 수 있는 제2 콘텐트 채널 선택들에 대해 매체 채널 제어기(406)에게 조회한다. 제2 매체 채널(428)은 데이터베이스(408)에 포함된 파라미터들 및 제1 매체 채널 선택과 관련된 특징들이 단정적으로 일치할 때(affirmative match) 자동으로 설정된다.

대표도

도 4

특허청구의 범위

청구항 1.

매체 콘텐트 채널 시스템에 있어서,

제1 콘텐트를 방송하기 위해 연결된 제1 네트워크 요소;

디지털 통신 채널을 통해 제2 콘텐트를 제공하기 위해 연결된 제2 네트워크 요소로, 상기 제2 콘텐트는 상기 제1 콘텐트에 기초하여 상기 제2 콘텐트를 갱신하기 위한 소정의 간격(interval)의 설명(description)을 포함하는 제2 네트워크 요소;

사용자 명령들을 수신하기 위한 사용자 인터페이스;

상기 사용자 명령들에 응답하여 선택된 방송 매체 채널을 통해 상기 제1 콘텐트를 수신하도록 연결된 이동 단말기를 포함하며, 상기 이동 단말기는

상기 방송 매체 채널의 선택을 검출하고, 상기 방송 매체 채널의 선택에 응답하여 상기 디지털 통신 채널을 통해 사용자 명령에 의해 상기 제2 콘텐트를 다운로드하도록 연결된 매체 채널 제어기를 포함하고, 상기 이동 단말기는

상기 디지털 통신 채널로부터 마크업 언어 콘텐트를 수신할 수 있고, 상기 제2 콘텐트의 적어도 일부를 상기 이동 단말기의 사용자에게 인지 가능하도록 할 수 있는 제2 재생기를 더 포함하며, 상기 2 재생기는

상기 소정의 간격(interval)으로 상기 제2 콘텐트를 갱신하도록 구성되는 것을 특징으로 하는 매체 콘텐트 채널 시스템.

청구항 2.

제1항에 있어서, 상기 이동 단말기는

상기 제1 콘텐트를 재생하기 위해 제1 매체 콘텐트 채널에 연결된 제1 재생기;

사용자 선택 명령들을 수신하기 위한 사용자 인터페이스; 및

상기 매체 채널 제어기에 연결된 데이터베이스;를 더 포함하며, 상기 매체 채널 제어기는

상기 사용자 선택 명령들에 응답하여 상기 데이터베이스로부터 채널 선택 파라미터들을 검색하며, 상기 채널 선택 파라미터들은 상기 제1 매체 콘텐트 채널과 관련된 것을 특징으로 하는 매체 콘텐트 채널 시스템.

청구항 3.

제2항에 있어서, 상기 제2 재생기는

상기 제1 콘텐트의 선택에 응답하여, 상기 제2 콘텐트의 소스에 수동으로 접속하도록 구성되는 것을 특징으로 하는 매체 콘텐트 채널 시스템.

청구항 4.

제2항에 있어서, 상기 제2 재생기는

상기 제1 콘텐트의 선택에 응답하여, 상기 제2 콘텐트의 소스에 자동으로 접속하도록 구성되는 것을 특징으로 하는 매체 콘텐트 채널 시스템.

청구항 5.

제4항에 있어서, 상기 제2 재생기는

상기 제2 네트워크 요소로부터 마크업 언어(markup language) 콘텐트를 수신하도록 연결된 브라우저를 포함하는 것을 특징으로 하는 매체 콘텐트 채널 시스템.

청구항 6.

삭제

청구항 7.

제5항에 있어서, 상기 소정의 간격들(intervals)은

상기 매체 채널 제어기에 의해 구성되는 것을 특징으로 하는 매체 콘텐트 채널 시스템.

청구항 8.

제7항에 있어서, 상기 소정의 간격들(intervals)은

상기 사용자 인터페이스를 사용해서 상기 데이터베이스에 프로그래밍되는 것을 특징으로 하는 매체 콘텐트 채널 시스템.

청구항 9.

제5항에 있어서, 상기 소정의 간격들(intervals)은

상기 제2 네트워크 요소에 의해 구성되는 것을 특징으로 하는 매체 콘텐트 채널 시스템.

청구항 10.

제5항에 있어서, 상기 제2 네트워크 요소는

무선 어플리케이션 프로토콜(Wireless Application Protocol: WAP) 표준들을 통해 상기 마크업 언어 콘텐트를 상기 브라우저에 자동으로 제공하도록 연결되는 것을 특징으로 하는 매체 콘텐트 채널 시스템.

청구항 11.

제5항에 있어서, 상기 브라우저는

상기 제2 네트워크 요소로부터 수신된 제1 마크업 언어 콘텐트를 포함하는 제1 버퍼; 및

상기 제2 네트워크 요소로부터 수신된 제2 마크업 언어 콘텐트를 포함하는 제2 버퍼;를 포함하며, 상기 제1 마크업 언어 콘텐트는 상기 제2 마크업 언어 콘텐트보다 구 버전(old version)인 것을 특징으로 하는 매체 콘텐트 채널 시스템.

청구항 12.

제11항에 있어서, 상기 브라우저는

상기 제1 마크업 언어 콘텐트 및 상기 제2 마크업 언어 콘텐트 간의 차이점들을 결정하도록 구성되며, 상기 제1 마크업 언어 콘텐트는 상기 제2 마크업 언어 콘텐트보다 구 버전(old version)인 것을 특징으로 하는 매체 콘텐트 채널 시스템.

청구항 13.

제12항에 있어서, 상기 브라우저는

상기 제1 마크업 언어 콘텐트 및 상기 제2 마크업 언어 콘텐트간의 차이점들이 발견되지 않을 때, 상기 제1 버퍼로부터 상기 이동 단말기의 디스플레이를 갱신하며, 상기 제1 마크업 언어 콘텐트는 상기 제2 마크업 언어 콘텐트보다 구 버전(old version)인 것을 특징으로 하는 매체 콘텐트 채널 시스템.

청구항 14.

제12항에 있어서, 상기 브라우저는

상기 제1 마크업 언어 콘텐트 및 상기 제2 마크업 언어 콘텐트간의 차이점들이 발견될 때, 상기 제2 버퍼로부터 상기 이동 단말기의 디스플레이를 갱신하며, 상기 제1 마크업 언어 콘텐트는 상기 제2 마크업 언어 콘텐트보다 구 버전(old version)인 것을 특징으로 하는 매체 콘텐트 채널 시스템.

청구항 15.

제14항에 있어서, 상기 디스플레이는

모든 상기 제2 마크업 언어 콘텐트가 상기 제2 네트워크 요소로부터 수신된 이후에만 갱신되는 것을 특징으로 하는 매체 콘텐트 채널 시스템.

청구항 16.

제5항에 있어서, 상기 사용자 인터페이스는

상기 디지털 통신 채널과의 사용자 응답을 검출하는 것을 특징으로 하는 매체 콘텐트 채널 시스템.

청구항 17.

제16항에 있어서,

소정의 시간 내에 사용자 응답이 검출되지 않는다면, 상기 디지털 통신 채널이 제거되는 것을 특징으로 하는 매체 콘텐트 채널 시스템.

청구항 18.

콘텐트를 제공할 수 있는 복수의 네트워크 요소들을 포함하는 네트워크에 무선 연결될 수 있는 이동 단말기에 있어서, 상기 이동 단말기는

디지털 통신 채널을 통해 마크업 언어 콘텐트를 수신할 수 있는 제2 재생기, 제1 재생기 및 매체 채널 제어기 중 적어도 하나를 저장할 수 있는 메모리;

상기 메모리에 연결된 프로세서로, 방송 콘텐트를 수신하기 위해 상기 제1 재생기가 선택되었음을 검출함에 응답하여, 상기 디지털 통신 채널을 통해 상기 제2 재생기가 제2 콘텐트를 사용자 명령에 의해 다운로드할 수 있도록 상기 매체 채널 제어기에 의해 구성되는 프로세서로,

상기 제2 콘텐트는 상기 방송 콘텐트와 관련되며, 상기 방송 콘텐트에 기초하여 상기 제2 콘텐트를 갱신하기 위한 소정의 간격(interval)의 설명을 포함하며,

상기 제2 재생기는 상기 제2 콘텐트가 상기 이동 단말기의 사용자에게 인지 가능하도록 하며, 상기 제2 재생기는 상기 소정의 간격(interval)으로 상기 제2 콘텐트를 갱신하도록 구성되는 프로세서; 및

상기 디지털 통신 채널을 통해 상기 복수의 네트워크 요소들과의 콘텐트 교환을 위한 트랜시버를 포함하는 것을 특징으로 하는 이동 단말기.

청구항 19.

삭제

청구항 20.

제18항에 있어서, 상기 이동 단말기는

청각적인, 시각적인, 또는 촉각적인 입력들 중 하나를 통한 사용자 명령들을 허용하는 사용자 인터페이스를 더 포함하는 것을 특징으로 하는 이동 단말기.

청구항 21.

제18항에 있어서, 상기 제1 재생기는

청각적 및 시각적 재생 능력을 제공하는 것을 특징으로 하는 이동 단말기.

청구항 22.

제18항에 있어서, 상기 제2 재생기는

청각적 및 시각적 재생 능력을 제공하는 것을 특징으로 하는 이동 단말기.

청구항 23.

제22항에 있어서, 상기 제2 재생기는

마크업 언어 능력을 가진 브라우저를 더 포함하는 것을 특징으로 하는 이동 단말기.

청구항 24.

제23항에 있어서, 상기 브라우저는

상기 제1 재생기의 매체 콘텐트 채널 활성화(activity)에 응답하여 URL(Uniform Resource Locator)에 자동으로 접속하도록 상기 매체 채널 제어기에 의해 구성되는 것을 특징으로 하는 이동 단말기.

청구항 25.

제24항에 있어서, 상기 URL은

상기 제1 재생기의 매체 콘텐트 채널 활성화(activity)와 관련될 때 상기 데이터 베이스에 위치하는 것을 특징으로 하는 이동 단말기.

청구항 26.

삭제

청구항 27.

제25항에 있어서, 상기 소정의 간격들(intervals)은

상기 매체 채널 제어기에 의해 구성되는 것을 특징으로 하는 이동 단말기.

청구항 28.

제25항에 있어서, 상기 소정의 간격들(intervals)은

상기 URL에 의해 정의된 위치에 포함된 데이터에 의해 구성되는 것을 특징으로 하는 이동 단말기.

청구항 29.

제25항에 있어서, 상기 메모리는

상기 URL로부터의 구(old) 데이터를 저장하기 위해 연결된 제1 버퍼; 및

상기 URL로부터의 신(new) 데이터를 저장하기 위해 연결된 제2 버퍼;를 더 포함하는 것을 특징으로 하는 이동 단말기.

청구항 30.

제29항에 있어서, 상기 프로세서는

상기 제1 버퍼의 콘텐트들과 상기 제2 버퍼의 콘텐트들을 비교하는 것을 특징으로 하는 이동 단말기.

청구항 31.

제30항에 있어서, 상기 프로세서는

상기 제1 버퍼의 콘텐트들 및 상기 제2 버퍼의 콘텐트들 간에 차이점들이 없다면, 상기 제1 버퍼로부터 상기 이동 단말기의 디스플레이를 갱신하는 것을 특징으로 하는 이동 단말기.

청구항 32.

제30항에 있어서, 상기 프로세서는

상기 제1 버퍼의 콘텐트들 및 상기 제2 버퍼의 콘텐트들 간에 차이점들이 있다면, 상기 제2 버퍼로부터 상기 이동 단말기의 디스플레이를 갱신하는 것을 특징으로 하는 이동 단말기.

청구항 33.

콘텐트 채널 생성을 위한, 이동 단말기에 의해 실행 가능한 명령들을 저장한 컴퓨터로 독출 가능한 매체로,

제1 콘텐트 채널 요청에 응답하여 방송 채널을 통해 방송 콘텐트의 수신을 설정하는 단계;

상기 제1 콘텐트 채널 요청에 응답하여 디지털 통신 채널을 생성하는 단계로, 상기 디지털 통신 채널은 상기 이동 단말기에 마크업 언어 콘텐트를 제공할 수 있는 단계; 및

상기 디지털 통신 채널을 통해 제2 콘텐트를 수신하는 단계로, 상기 제2 콘텐트는 상기 방송 채널과 관련되며, 상기 방송 콘텐트에 기초하여 상기 제2 콘텐트를 갱신하기 위한 소정의 간격(interval)의 설명을 포함하는 단계;

상기 제2 콘텐트를 상기 이동 단말기의 사용자에게 인지 가능하도록 하는 단계; 및

상기 소정의 간격(interval)으로 상기 제2 콘텐트를 갱신하는 단계를 수행하기 위한 명령들을 포함하는 컴퓨터로 독출 가능한 매체.

청구항 34.

이동 단말기의 사용자로부터 수신된 방송 콘텐트 채널 요청에 응답하여 상기 이동 단말기와 방송 콘텐트 채널을 설정하는 단계;

상기 방송 콘텐트 채널 요청에 응답하여 상기 이동 단말기와 디지털 통신 채널을 생성하는 단계로, 상기 디지털 통신 채널은 마크업 언어 콘텐트를 상기 이동 단말기에 제공할 수 있는 단계;

상기 디지털 통신 채널을 통해 제2 콘텐트를 사용자 명령에 의해 다운로드하는 단계로, 상기 제2 콘텐트는 상기 방송 콘텐트 채널을 통해 수신된 콘텐트와 관련되며, 상기 방송 콘텐트에 기초하여 상기 제2 콘텐트를 갱신하기 위한 소정의 간격(interval)의 설명을 포함하는 단계;

상기 이동 단말기를 통해 상기 제2 콘텐트를 상기 이동 단말기의 사용자에게 인지 가능하도록 하는 단계; 및

상기 소정의 간격(interval)으로 상기 제2 콘텐트를 갱신하는 단계를 포함하는 것을 특징으로 하는 방법.

청구항 35.

제34항에 있어서, 상기 디지털 통신 채널을 생성하는 단계는

상기 방송 콘텐트 채널과 관련된 파라미터들을 검색하는 단계;

상기 디지털 통신 채널이 필요한지를 결정하기 위해 상기 방송 콘텐트 채널과 관련된 파라미터들을 분석하는 단계;

상기 파라미터들이 생성될 제2 콘텐트 채널을 정의하는 경우 상기 디지털 통신 채널을 설정하는 단계를 포함하는 것을 특징으로 하는 방법.

청구항 36.

제35항에 있어서, 상기 방송 콘텐트 채널과 관련된 파라미터들은

무선 방송국의 방송 주파수; 및

상기 무선 방송국과 관련된 URL(Uniform Resource Locator)을 포함하는 것을 특징으로 하는 방법.

청구항 37.

제36항에 있어서, 상기 방송 콘텐트 채널은

상기 무선 방송국으로부터 방송 콘텐트를 수신하도록 구성되며, 상기 디지털 통신 채널은 상기 URL에 의해 정의된 위치로부터 마크업 언어 콘텐트를 수신하도록 구성되는 것을 특징으로 하는 방법.

청구항 38.

제35항에 있어서, 사용자 명령에 의한 상기 디지털 통신 채널의 생성은

방송 콘텐트 채널 활성화(activity)와 동기되는 것을 특징으로 하는 방법.

명세서

기술분야

본 발명은 매체 콘텐트 채널들에 관한 것으로, 더욱 상세하게는 사용자에 의해 선택된 제1 콘텐트 채널에 응답하여 이동 단말기내에 설정되는 제2 매체 콘텐트 채널들에 관한 것이다.

배경기술

이동 통신 산업은 최근 수년간 뛰어난 성장 주기를 경험해 왔다. 멀티미디어 메시지 시스템(Multimedia Messaging System, MMS), 자바(Java), 및 확장 가능 하이퍼텍스트 마크업 언어(Extensible HyperText Markup Language, XHTML)와 같은 새로운 서비스 인에이블러들(enablers)은 이동 산업을 위한 성장의 새로운 소스들 및 소비자들을 위한 새로운 서비스들을 계속 강요할 것이다. 이러한 모바일 서비스들의 발전은 소비자 행동, 모바일 서비스 도메인들 및 기술을 둘러싼 비즈니스 구조를 사용함으로, 계속 성장할 것이다.

그러나, 전개되는 모바일 서비스들의 성공적인 따라잡기를 확실히 하기 위해서는 소비자들은 그러한 모바일 서비스들을 검색할 수 있어야 한다. 현재, 모바일 브라우징은 그러한 서비스들을 검색하기 위해 모바일 서비스 소비자에 의해 사용되는 지배적인 방법이다. 전형적인 브라우징 세션은 사용자가 모바일 브라우저를 사용해서 이동 네트워크를 액세스할 때 일반적으로 개시된다. 다음에, 사용자는 관심있는 키워드를 브라우저로부터 네트워크 검색 엔진에 제출하며, 검색 엔진은 웹 페이지 기술들 및 키워드에 대응하는 그들의 대응하는 URL들(Uniform Resource Locators)을 반환한다. 검색 엔진에 의해 제공된 URL들을 왔다갔다 함으로써, 사용자는 그에게 관심이 있거나 관심이 없는 콘텐트를 검색한다. 따라서 상당부분, 사용자의 목적이 있는 노력들을 통해서만 서비스들이 검색된다. 더욱이, 서비스 검색의 성공은 주로 사용자에 의해 실행된 키워드의 선택에 의존하며, 간혹 부적절한 검색 결과들을 초래한다.

일반적으로, 사용자가 빠르고 정확한 검색 결과들을 생산할 수 있기 위해서는, 사용자에게 적절한 콘텐트에 집중하는 효율적인 검색 기반구조(infrastructure)가 요구된다. 부가하여, 효과적인 키워드 검색을 생성하기 위해서는 이미 만들어진 검색 템플릿들(templates)을 가진 단순한 사용자 인터페이스가 요구된다. 부가하여, 검색 기반구조는 사용자의 프로파일 및 선호도, 사용자의 이동성(mobility), 사용자의 위치, 사용자가 아마 사용하는 장치 프로파일, 및 검색 시간을 고려해야 한다.

모바일 인터넷상에서 사용자가 서비스들을 검색하는 것을 돕기 위해, 간혹 서비스 검색 엔진(Service Discovery Engine, SDE)의 사용이 활용된다. SDE는 사용자에게 네트워크상에서 웹 도메인 레지스트리들 및 캐리어(carrier)와의 사용자 상호작용(interaction)을 용이하게 하는 하나의 인터페이스 포인트를 제공한다. 또한, SDE는 그것과의 사용자 상호작용의 세션 정보, 어떠한 트랜잭션(transaction) 및 상호작용(interaction) 히스토리들, 및 사용자의 프로파일 및 선호도 서버 정보를 유지한다. 그러한 방식으로, 사용자의 성공이 극대화될 수 있도록, SDE는 사용자와의 상호작용을 개인화할 수 있다.

서비스 검색 매커니즘들은 소비자들의 모바일 인터넷과의 상호작용이 성숙될수록 계속 발전한다. 부가하여, 브라우저 기술은 진행중인 서비스 검색 매커니즘들(developing service discovery mechanisms)을 지원하도록 개선되고 있다. 그러나, 현재는 TV를 시청하거나, 라디오를 청취하거나 또는 다른 유사한 활동들과 같이 사용자의 현재의 콘텐트 소비 세션에 적절한 콘텐트 및 서비스들을 사용자가 검색할 수 있도록 함에 있어서는 최신 기술이 결여되어 있다.

더욱이, 그러한 크로스-매체 광고들(cross-media advertisements)에 관련된 콘텐트를 현재 소비하고 있는 사용자들에게 크로스-매체 광고들을 자동으로 가능하게 함에 있어서는 최신 기술이 결여되어 있다. 그러한 경우들에 있어서, 따라서 사용자의 현재 인터넷 세션과의 그들의 유사성에 기인한 사용자에게 적절한 서비스들은 최신 기술의 결여 때문에 사용자로부터 철회되고 있다. 또한 여전히 그러한 서비스들을 위해 사용되는 독립적인 채널을 가능하게 함에 있어서도 최신 기술이 결여되어 있다.

기본적인 크로스-매체 해결책들이 종래 기술에 존재하는데, 예를 들면 AM (Amplitude Modulation)/FM(Frequency Modulation) 무선 방송국들 및 그들의 대응하는 웹 싸이트들간에 존재한다. 특히, 무선 방송국의 웹 싸이트로부터 재생되는 현재 노래, 방송을 호스팅하는 디스크 자키의 신원 등에 관한 정보를 얻는 동안에, 사용자는 특정 FM 방송을 들을 수 있다. 부가하여, 요즘에는 제1 정보, 즉 라디오 방송이 액세스되는 동안에, 배경 정보에 대한 사용자 액세스를 가능하게 하는 매체 재생기 해결책들을 제공하는 웹 라디오들이 존재한다. 그러나, 그러한 해결책들은 제1 채널이 활성화인 동안에는 제2 채널을 자동으로 열지 않는다. 오히려, 사용자는 그 또는 그녀의 주도로 의도적으로 제2 채널을 열 필요가 있다.

따라서, 최신 기술의 결여들을 수정하기 위해 개선된 서비스 검색 매커니즘을 용이하게 하는 시스템, 방법, 및 장치가 이동 통신 산업에서 요구된다. 특히,사용자가 제1 콘텐트를 소비하는 동안에, 사용자가 그 또는 그녀의 관심일 수 있는 제2 또는 보조 정보를 자동으로 수신할 수 있도록, 크로스-매체 통신이 가능해야 한다. 더욱이, 크로스-매체 통신 채널은 자동으로 검색되어야 하며, 사용자의 선택시 가능해야 한다. 또한, 제2 콘텐트에서 사용자 관심이 극대화될 수 있도록, 크로스-매체 통신 채널은 사용자에 의해 소비되고 있는 제1 콘텐트에 관련되어야 한다.

발명의 상세한 설명

종래 기술의 한계들을 극복하고, 본 명세서를 읽고 이해할 때 명백하게 될 다른 한계들을 극복하기 위해서, 본 발명은 제1 및 제2 콘텐트 채널들을 용이하게 하기 위한 시스템, 방법, 및 장치를 개시한다.

본 발명의 일 실시예에 따라서, 복수의 매체 콘텐트 채널들을 모바일 사용자에게 제공하기 위한 매체 콘텐트 채널 시스템이 제공된다. 상기 매체 콘텐트 채널 시스템은 제1 콘텐트를 제공하기 위해 연결된 제1 네트워크 요소 및 제2 콘텐트를 제공하기 위해 연결된 제2 네트워크 요소, 및 상기 제1 콘텐트를 선택하기 위해 연결된 이동 단말기;를 포함하는 것을 특징으로 한다. 상기 이동 단말기는 상기 제1 콘텐트의 선택을 검출하기 위해 연결되고, 제1 매체 콘텐트 채널의 선택에 응답하여 상기 제2 콘텐트를 수신하도록 제2 매체 콘텐트 채널을 인스턴스화(instantiate)하기 위해 연결된 매체 채널 제어기를 포함하는 것을 특징으로 한다.

본 발명의 다른 실시예에 따르면, 콘텐트를 제공할 수 있는 복수의 네트워크 요소들을 포함하는 네트워크에 무선 연결된 이동 단말기가 제공된다. 상기 이동 단말기는 매체 채널 제어기, 제1 재생기, 제2 재생기, 및 데이터베이스 중 적어도 하나를 저장할 수 있는 메모리를 포함하는 것을 특징으로 한다. 상기 이동 단말기는 상기 메모리에 연결되며, 콘텐트를 수신하기 위해 상기 제1 재생기가 선택되었음을 검출함에 응답하여 상기 제2 재생기가 콘텐트를 수신할 수 있도록 상기 매체 채널 제어기에 의해 구성된 프로세서 및 복수의 네트워크 요소들과의 콘텐트 교환을 용이하게 하도록 구성된 트랜시버를 포함하는 것을 특징으로 한다. 대안적인 실시예에서, 상기 데이터베이스는 상기 이동 단말기의 외부에 존재하는 것을 특징으로 한다.

본 발명의 다른 실시예에 따르면, 콘텐트 채널 생성을 용이하게 하기 위해 이동 단말기에 의해 실행 가능한 명령어들이 저장된 컴퓨터로 독출 가능한 매체가 제공된다. 상기 명령어들은 제1 콘텐트 채널 요청에 응답하여 제1 콘텐트 채널을 설정하는 단계, 상기 제1 콘텐트 채널 요청에 응답하여 제2 콘텐트 채널을 생성하는 단계, 및 상기 제2 콘텐트 채널과의 상호작용 능력을 설정하는 단계를 포함하는 단계들을 수행하며, 상기 상호작용은 상기 제1 콘텐트 채널에 관련되는 것을 특징으로 한다.

본 발명의 다른 실시예에 따르면, 복수의 콘텐트 채널들을 제공하기 위한 방법이 제공된다. 상기 방법은 제1 콘텐트 채널 요청에 응답하여 제1 콘텐트 채널을 설정하는 단계, 상기 제1 콘텐트 채널 요청에 응답하여 제2 콘텐트 채널을 생성하는 단계, 및 상기 제2 콘텐트 채널과의 상호작용 능력을 설정하는 단계를 포함하며, 상기 상호작용은 상기 제1 콘텐트 채널에 관련되는 것을 특징으로 한다.

본 발명을 특징 지우는 다양한 다른 장점들 및 신규한 특징들은 여기에 첨부된 청구항들에 상세하게 지적되어 있으며, 그의 일부를 형성한다. 그러나, 본 발명, 장점들, 및 그 사용에 의해 획득되는 목적들을 더 잘 이해하기 위해서는, 그의 또 다른 부분을 형성하는 도면들 및 첨부된 기술적 사항이 참조되어야 하며, 이것들에는 본 발명에 따른 장치의 기술되고 설명된 특정 실시예들이 있다.

본 발명은 다음의 도면들에서 기술된 실시예들과 관련하여 기술된다.

실시예

다음의 예시적인 실시예의 기술에서, 본 발명의 일부를 구성하는 첨부된 도면들이 참조되며, 여기서 본 발명이 실행될 수 있는 다양한 실시예들의 기술의 방식으로 도시되어 있다. 본 발명의 범위를 벗어나지 않고 구조적인 그리고 조작상의 변경들이 이루어질 수 있는 것처럼, 다른 실시예들이 실행될 수 있다는 점이 이해되어야 한다.

일반적으로, 본 발명은 제1 콘텐트 채널을 제어하는 자가 이동 단말기 사용자로의 보충적 콘텐트 공급(supplemental content feed)을 생성할 수 있도록 하는 시스템, 방법 및 장치에 관한 것이다. 상기 보충적 콘텐트 제공은 제1 콘텐트 채널과 관련된 제2 활동들(activities)에 사용자를 끌어들이도록 구성된다. 그러한 방식으로, 사용자를 부추겨 그 또는 그녀가 그렇지 않았다면 즐길 수 있도록 특권이 부여될 수 없는 다른 콘텐트의 검색, 제품들, 서비스들, 또는 대화(interaction)로 이끌 수 있다. 본 발명은 브라우저 기반의 채트(chat)와 같이 소비된 라디오 또는 TV 프로그래밍 등에 커멘트 채널(comment channel)을 설정하는 다수의 서비스들을 위해 사용될 수 있다. 부가하여, MIME(Multi-purpose Internet Mail Extensions) 타입의 파일 산입(inclusion)과 함께 POST 능력(capability)을 가지는 본 발명에 따른 브라우저는 픽처들이 이동 단말기들로부터 직접 어떠한 수직적인 서비스 싸이트들로 업로드될 수 있는 경우에 서비스들을 생성할 수 있다. 더욱이, 본 발명은 브라우저에서의 HTTPS(HyperText Transfer Protocol Secure) 기능 및 사용자이름/패스워드 식별과 같은 알려진 기술들을 사용함으로써, 가입(subscription) 기반 또는 보안 매체 채널들을 지원한다.

서비스 인에이블러들(enablers)은 모바일 서비스들을 생성하기 위한 블록들을 만드는 기본 기술이다. 서비스 인에이블러들과 관련된 주요한 기준은 서비스 인에이블러들 소비자들을 위해 새롭고 더 나은 서비스들을 가능하게 하고; 새로운 서비스들의 개발을 용이하게 하는 시설들을 개발자들에게 제공하며; 산업 투자자들(industry stakeholder)를 위한 가능한 새로운 비즈니스를 만들고; 서비스 상호이용을 보장하기 위해 OMA(Open Mobile Alliance)에 의해 개발된 것들과 같은 공개 글로벌 표준들에 기반을 둔다는 점이다.

콘텐트 및 강제 서비스들(compelling services)의 포트폴리오를 유지하는 것은 성공적인 모바일 서비스들 시장을 주도함에 있어서 중요한 요구조건이다. 초점은 소비자에게 있어야 하는데, 왜냐하면 서비스 소비에 대한 키는 고객 수용이기 때문이다. 둘째로, 성공적인 모바일 서비스들을 위해서는 건강한 이익-창출 논리에 기반을 둔 균형잡힌 비즈니스 시스템이 요구된다. 셋째로, 콘텐트 제공자들, 어플리케이션 개발자들, 벤더들/제조자들, 캐리어들(carriers), 및 정보 기술(Information Technology, IT) 벤더들이 소비자들에게 공동 사용 가능한 장치들 및 서비스들의 광범위한 선택을 제공할 수 있도록, 서비스 인에이블러들은 공개 글로벌 표준들에 따라야 한다. 그처럼, 서비스 인에이블러들은 소비자 흔동을 경감시킬 것이며, 산업 성장을 자극할 것이다.

멀티미디어 메시지 서비스(Multimedia Messaging Service, MMS)는 성공적인 모바일 서비스들을 위해 필요한 중요한 서비스 인에이블러들의 하나이다. MMS가 지원하는 모바일 서비스들의 높은 시장획득(penetration) 및 신속한 따라잡기(take-up)를 유도할 새로운 콘텐트 타입들 및 새로운 기능들을 첨가함으로써, MMS는 잘 설정된 짧은 메시지 서비스(Short Messaging System, SMS) 모델에 기반을 둔다. MMS는 다양한 콘텐트 포맷들을 지원하며, 따라서 개인 대 개인 메시지 외에도 많은 서비스들을 가능하게 한다. 따라서, MMS 기술은 모바일 도메인을 위한 수 없는 서비스들에 대하여 미들웨어(middleware)로서 사용될 수 있다. 더욱이, MMS는 디지털 권한 관리(Digital Rights Management, DRM), 즉 호출음들, 에니메이션 스크린 세이버들, 및 다운로드 가능한 게임팩들에 의해 보호되는 콘텐트를 위한 선택적인 전달 메커니즘으로서 사용될 수 있다. 소비자들은 또한 푸시 및 풀 콘텐트 동작들(push and pull content operations)을 용이하게 하는 MMS 기반 서비스들을 구독할 수 있다. 이러한 서비스들은 헤드라인 뉴스들, 일간 카툰 스트립들, 주식 시세들, 소비자들의 선호도들에 관한 광고, 소비자들의 프로파일에 관한 광고 등을 포함할 수 있다.

콘텐트의 모바일 사용자로의 전달은 대화형(interactive) 다운로드 및 비대화형(non-interactive) 다운로드 매커니즘들의 사용을 통해 영향받는다. 대화형 다운로드에 관하여, 다운로드될 콘텐트의 검색 및 다운로딩의 실제 메커닉들(mechanic)이 하나의 세션, 즉 브라우징 세션의 일부가 되도록, 검색 프로세스 및 실제 다운로드는 통합된 프로세스이다. 그러나, 비대화형 다운로드에서는, 검색 및 전달 프로세스들은 전형적으로 분리되어 있으며, 여기서 다운로드 매커니즘을 제공하기 위해 메시지(messaging)가 사용된다.

도 1은 이동 장치(102)로의 대화형 및 비대화형 콘텐트 다운로드 외에도 모바일 브라우징 기능들 모두를 용이하게 하기 위해 사용되는 일반적인 네트워크 아키텍처(100)를 기술하고 있다. 액세스 포인트(104)는 이동 단말기(102)로부터 캐리어 서비스 포털(carrier service portal)(106), WAP 게이트웨이(108), 및 다운로드 서버(112)로의 연결을 제공한다. 액세스 포인트(104)는 예를 들면, 회로 교환 데이터(Circuit Switched Data, CSD) 서비스 또는 범용 패킷 무선 서비스(General Packet Radio Service, GPRS) 액세스 포인트중 어느 하나로 구현될 수 있다. 캐리어 서비스들의 검색은 캐리어 서비스 포털(106)을 통해 지원되며, 이것은 다운로드 가능한 콘텐트를 소비자들, 즉 이동 장치(102)에 지원한다.

무선 어플리케이션 프로토콜(Wireless Application Protocol, WAP) 접속에서, WAP 게이트웨이(108)는, 다른 기능들 중에서, 캐리어 서비스 포털(106) 및 다운로드 서버(112) 모두를 액세스하기 위해 필요한, WAP으로부터 하이퍼텍스트 전송 프로토콜(HyperText Transfer Protocol, HTTP)로의 프로토콜 변환을 제공한다. 콘텐트 저장부(114)는 이동 장치(102)와 같은 소비자들로 전달될 정보 및 아이템들을 위한 저장 설비들을 제공한다. 다운로드 서버(112)는 다운로드 트랜잭션들을 관리하며, 콘텐트에 대한 다운로드 요청들을 수신하고, 콘텐트 저장부(114)로부터 콘텐트를 가져오며, 콘텐트를 이동 장치(102)로 전달하며, 다운로드 결과로서 생성될 수 있는 빌링(billing)을 처리한다. 과금 센터(110)는 빌링 기록들을 생성하는데 사용되는 다운로드 서버로부터 수신된 호 데이터 기록들(Call Data Records, CDR)을 처리한다. 또한, 과금 센터(110)는 사전에 신용 검사 능력(credit check capabilities)을 제공하며, 혁신적인 가격 및 비즈니스 모델들을 지원한다.

일반적인 네트워크 아키텍처(100)는 WAP 게이트웨이(108)의 일부로서 개념화될 수 있는 푸시 프록시 게이트웨이(Push Proxy Gateway, PPG)를 통해 WAP 푸시 기술을 위한 골격구조를 제공한다. WAP에서의 푸시 동작은 푸시 개시자(Push Initiator, PI) 즉, 다운로드 서버(112)에서 동작하는 어플리케이션으로 하여금 푸시 콘텐트 및 명령들을 PPG로 전송하도록 허용함으로써 수행되며, 상기 PPG는 상기 푸시 콘텐트를 상기 명령들에 따라 푸시 클라이언트, 즉 이동 단말기(102)로 전달한다. PI는 푸시 액세스 프로토콜(Push Access Protocol, PAP)을 통해 PPG와 통신하며, 반면에 PPG는 푸시된 콘텐트를 궁극적으로 이동 단말기(102)에 전달하기 위해 푸시 전파(Over-the-Air, OTA) 프로토콜을 사용해서 이동 단말기와

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통신한다. WAP 푸시 기술은 GPRS 가능 통신 시스템에 특히 적합하다. 유사하게, WAP 풀 동작(WAP pull operation) 이 또한 일반적인 네트워크 아키텍처(100)에서 구현될 수 있다. 예를 들면, 이동 단말기(102)가 다운로드 서버(112)로부터 정보를 "풀(pull)" 또는 요청할 때, WAP 풀 동작은 WAP 푸시 동작을 활용할 수 있다. 그러한 경우에, "풀(pulled)" 정보는 그후에 위에서 논의된 바와 같이 다운로드 서버(112)로부터 이동 단말기(102)로 푸시된다.

도 2는 본 발명에 따라 GPRS를 사용하는 예시적인 통신 네트워크(200)를 기술하고 있다. GPRS는 인터넷 모델을 반영하며 3G(제3세대) 네트워크들을 향한 무결정성 변환(seamless transition)을 가능하게 하는 전지구적 이동 통신 시스템(Global System for Mobile Communication, GSM)을 위한 패킷-교환 서비스이다. GPRS는 따라서 모바일 GSM 및 시분할 다중 액세스(Time Dividion Multiple Access, TDMA) 사용자들을 위한 실제의 패킷 무선 액세스를 제공하며, WAP 서비스들을 위해 이상적이다. 도 2의 예시적인 실시예들은 일반적으로 GPRS/GSM과 관련하여 기술되지만, GSM 및 GPRS에 대한 특정 레퍼런스들은 본 발명의 이해를 용이하게 하기 위해 제공된다는 점에 유의해야 한다. 여기서 제공된 기술로부터 당해 분야의 숙련자들에게 명백한 바와 같이, 본 발명은 다른 회로-교환 및 패킷-교환 기술들, 3G 기술들, 및 그위의 기술들을 포함하는 다른 기술들에게도 동등하게 적용 가능하다.

이동 단말기들(202 및 216)은 무선 인터페이스(air interface)를 통해 기지국(Base Transceiver Station, BTS)(204 및 208)과 각각 통신한다. BTS(204 및 208)는 가입자 트래픽이 이동 단말기들(202 및 216)로 또는 이동 단말기들(202 및 216)로부터 전달되는 무선 인터페이스를 종료시키는 무선 네트워크 액세스 기반구조의 구성요소들이다. 기지국 제어기(Base Station Controller, BSC)(205 및 209)는, 다른 것들 중에서도, 각 BTS(204 및 208)에서의 전력 레벨 제어 및 핸드오프 기능들을 각각 제공하는 스위칭 모듈들이다. BSC(205 및 209)는 모바일 스위칭 센터(Mobile Switching Center, MSC)(206) 및 BTS(204 및 208)간의 인터페이스를 제어하며, 따라서 호 설정 기능들(call set-up functions), 시그널링, 및 무선 채널들의 사용에 있어서 하나 이상의 BTS들을 제어한다. BSC(205 및 209)는 또한 서빙 GPRS 지원 노드(Serving GPRS Support Node, SGSN)(210) 및 BTS(204) 그리고 SGSN(214) 및 BTS(208)간에 각각의 인터페이스들을 제어한다.

SGSN(210)은 기지국 서브시스템(Base Station Subsystem, BSS), 더욱 상세하게는 GSM 시스템들의 환경에서 BSC(205 및 209)를 통해 패킷들을 송신 또는 수신함에 의해, GPRS 이동 단말기를 지원한다. SGSN(210 및 214)은 서비스 영역내에서 이동 단말기들(202 및 216)로부터 및 이동 단말기들(202 및 216)로의 데이터 패킷들의 전달을 책임지며, 패킷 라우팅 및 전달, 이동성 관리, 논리 링크 관리, 인증, 과금 기능들 등을 수행한다. 도 2에서 도시된 예시적인 GPRS 실시예에서, SGSN(210)의 위치 레지스터는 SGSN(210)에 등록된 모든 GPRS 사용자들의 국제 이동 가입자 아이덴티티 번호(International subscriber Identity Number, IMSI)와 같은 사용자 프로파일들 외에도, 이동 단말기(202)와 관련된 현재 셀 및 방문 위치 레지스터(Visiting Location Register, VLR)와 같은 위치 정보를 저장한다. SGSN(210 및 214)은 현재 기술된 실시예와 관련하여 궁극적으로는 SMSC(212) 및/또는 MMSC(220)에 연결된다. GSM이 기초를 이루는 기술을 수행하는 반면에, 위에서 기술된 SGSN(210 및 214)은 GPRS 기술을 통해 도입된 네트워크 요소들이다. GPRS 환경에서 도입된 다른 네트워크 요소는 게이트웨이 GPRS 지원노드(Gateway GPRS Support Node, GGSN)(222)로, 이것은 GPRS 네트워크(218) 및 WAP 게이트웨이(224)간의 게이트웨이로 작용한다.

MMSC(220)는 텍스트, 사진들, 비디오 및 다른 매체 타입들로 이루어진 멀티미디어 메시지들의 전달을 위한 메시지 능력들(messaging capabilities)을 제공한다. 메시지 능력들은 다른 이동 단말기 또는 어플리케이션들로 전송되는 모바일 발신 메시지들(mobile originated messages) 및 이동 단말기들 또는 다른 어플리케이션들로 전송되는 어플리케이션 발신 메시지들을 포함한다. MMSC(220)는 전자 메일 서비스와 같이 다른 메시지 시스템들간의 메시지들 전달 외에도 입력 및 출력 MMS 메시지들을 저장할 책임이 있다. 부가하여, MMSC(220)는 예를 들면 서비스 포털(226)을 통해 주식 시장 시세 서비스들 또는 날씨 보고 서비스들와 같은 가치 부가 서비스들(value added service)을 모바일 가입자들에게 제공하기 위해 어플리케이션 개발자들 및 서비스 제공자들로 하여금 MMSC(220)에 연결하도록 하는 외부 어플리케이션 인터페이스(Extenal Application Interface, EAIF)(미도시)를 제공할 수 있다.

타워(234)는 이동 단말기(202)에 도달하기에 충분한 전송 반경을 가지는 AM/FM 방송 무선방송국을 나타낸다. GPRS 접속성을 제공하는 외에도 이동 단말기(202)는 또한 별개의 AM/FM 튜닝 능력을 제공한다. 바꾸어 말하면, 이동 단말기는 그 GPRS 능력에 의해 가능한 제1 매체 콘텐트 채널을 통한 완벽한 음성 및 메시징 기능을 제공할 뿐만 아니라, 그의 별개의 AM/FM 튜닝 능력에 의해 가능한 제2 매체 콘텐트 채널을 제공한다. 이동 단말기(202)의 사용자가 제1 매체 콘텐트 채널에 의해 전달된 콘텐트를 소비할 때, 예를 들면 사용자는 또한 그 또는 그녀가 좋아하는 컨트리 음악 무선방송국을 즐길 수 있다. AM/FM 무선방송국(234)은 또한 WWW 서버(230)를 통해 제공되는 인터넷 능력을 가지고 있다. 따라서, AM/FM 무선방송국(234)이 외부로 가는(outbound) AM/FM 콘텐트를 그의 청취자들 즉, 이동 단말기(202)에 제공하는 동안

에, 그것은 또한 WWW 서버(230)에 의해 호스팅되는 그의 웹 페이지를 통해 그리고 WWW 서버(230)에 의해 또한 호스팅되는 그의 전자 메일 서버(미도시)를 통해 인터넷 프로토콜(Internet Protocol, IP) 네트워크(238)내에서 공동 이용이 가능하다.

타워(236)는 TV(232)에 도달하기에 충분한 전송 반경을 가지는 TV 방송국을 나타낸다. TV 스테이션(236)이 외국행의(outbound) TV 콘텐트를 그의 시청자들, 즉 이동 단말기(216)의 사용자에게 제공하는 동안에, 그것은 또한 WWW 서버(228)에 의해 호스팅되는 그의 웹 페이지를 통해 그리고 WWW 서버(228)에 의해 또한 호스팅되는 그의 전자 메일 서버(미도시)를 통해 인터넷 프로토콜(Internet Protocol, IP) 네트워크(238)내에서 공동 이용될 수 있도록, TV 스테이션(236)은 또한 WWW 서버(228)를 통해 제공되는 인터넷 능력을 가진다. 사용자가 그 또는 그녀가 좋아하는 TV 스테이션을 즐기는 동안에, 그 또는 그녀는 또한 모바일 브라우징, 메시징, 리치 콘텐트 전달(rich content transfer) 등이 필요할 때 GPRS 네트워크(218) 및 IP 네트워크(238)를 액세스할 수 있도록, 이동 단말기(216)의 사용자는 TV(232)와 함께 배치된다고 가정된다.

대표적인 네트워크 환경으로 기술되는 이전에 언급된 네트워크 시스템과 함께, 저장 및 전달 메시징 시나리오(store and forward messaging scenario)가 이제 기술되는데, 이러한 시나리오에서 WAP 푸시 골격구조가 WWW 서버(230)으로부터 MMSC(220)으로 전송된 메시지를 저장하기 위해 사용된다. 점선(240)은 WWW 서버(230)로부터 흘러나오는 멀티미디어 메시지 흐름을 나타내며, 이것은 궁극적으로는 MMSC(220)로 포스팅되며, 예를 들면 이동 단말기(202)로부터의 이전의 WAP 풀 요청(WAP pull request)의 결과일 수 있다. WAP 프로토콜 수트(suite)는 GPRS 네트워크(218)내에서 데이터 전송 매커니즘으로 사용되는데, 왜냐하면 WAP은 이동 네트워크들에 대해 최적화된 데이터 전송 서비스들을 제공하기 때문이다. WAP은 또한 기초를 이루는 네트워크에 관계없이 단일한 전송 서비스들을 제공한다.

특히, 무선 세션 프로토콜(Wireless Session Protocol, WAP) 계층은 전송 매커니즘의 기초를 제공하며, 여기서 MMS 프로토콜 데이터 유닛(Protocol Data Unit, PDU)은 예를 들면, 이동 단말기(202)와 MMSC(220) 사이에서 매체 콘텐트를 전송하는데 사용된다. PDU내의 MMS 헤더들은 발신자로부터 목적지로 PDU를 어떻게 전달할 것인지에 대한 정보를 주로 포함하고 있다. 헤더들은 소스 유닛 식별, 싱크 유닛 식별, 메시지 식별, 콘텐트 타입 등과 같은 정보를 포함할 수 있다. 콘텐트 타입은 일부만을 열거한다면, 이미지들, 또는 비디오, 즉 JPEG 또는 GIF 포맷; 텍스트, 즉 단순하거나 또는 포맷된 텍스트와 같이, MMS에 의해 지원되는 어떠한 콘텐트 타입일 수 있다. MMS 메시지들이 예를 들면, WAP 게이트웨이(224) 및 MMSC(220)간에 전송될 때, MMS PDU들의 HTTP 캡슐화가 필요하다. HTTP 캡슐화의 메시지 몸체는 어떠한 수의 이진 코딩된, MIME 메시지 부분들을 포함한다.

일단 멀티미디어 메시지가 WWW 서버(230)에 의해 MMSC(220)로 전송되면, 콘텐트 수신에 대한 표시가 이동 단말기(202)에 제공되며, 이것은 점선(242)으로 표기되었다. 통지(242)는 OMA에 의해 정의되는 푸시 의미론들(push semantics)을 사용하며, 이것은 수신 통지를 예를 들면, SMS 베어러(bearer) 및 짧은 메시지 서비스 센터(Short Message Service Center, SMSC)(212)를 통해 수신 장치, 즉 이동 단말기(202)에 전달한다. 푸시 메시지에서 통지 메시지를 전송하는데 사용되는 MMS PDU는 M-Notification.ind이다. M-Notification.ind는 이동 단말기(202)에게 수신된 메시지(240)의 콘텐트들에 대해 알리며, 그 목적은 이동 단말기(202)가 MMSC(220)로부터 멀티미디어 메시지(240)를 가져오도록 허용하는 것이다. 통지(Notification) PDU는 옥텟들인 멀티미디어 메시지의 크기; 및 멀티미디어 메시지의 위치, 즉 MMSC(220)와 같은 멀티미디어 메시지의 특징들을 정의하는 MMS 헤더들로 이루어진다. 일단 통지 메시지(242)가 수신되면, 통지 메시지의 단일 리소스 식별자(Uniform Resource Identifier, URI)에 의해 지정된 콘텐트를 수신하기 위해 WAP/GET 동작, 즉 메시지(244)는 이동 단말기(202)에 의해 자동으로 또는 수동으로 개시될 수 있다. 일단 콘텐트가 이동 단말기(202)에 의해 수신되면, 소스 즉 WWW 서버(230)로의 콘텐트의 성공적인 수신을 나타내는 통지가 제공된다.

도 3은 이동 단말기(300) 예를 들면, 본 발명에 따라 사용될 수 있는 도 2의 이동 단말기(202)의 예시적인 기능적 블록도를 기술하고 있다. 일 실시예에서, 사용자가 도 2의 AM/FM 무선방송국(234)에 의해 전송된 특정 무선방송국으로 튜닝할 때, 이동 단말기(300)는 자동으로 매체 콘텐트 채널을 설정한다. 사용자 인터페이스(User Interface, UI) 로직 블록(302)은 이동 단말기의 사용자로 하여금 무선 모듈(304)과 관련된 AM/FM 튜닝 기능을 선택하도록 구성된다. 예를 들면, 사용자는 사용자에 의해 선택된 특정 무선 채널에 응답하여 무선 모듈(304)이 그의 수신기를 튜닝하도록 하는 UI 로직 블록(302)으로부터 프리셋 무선 채널들(preset radio channel)을 액세스할 수 있다. 그러면, UI 로직 블록(302)에 의해 발행된 튜닝 명령에 응답하여 이동 단말기(300)의 사용자는 무선 모듈(304)에 의해 생성된 가청 콘텐트를 자유롭게 즐길 수 있다.

일단 무선 채널이 선택되면, UI 로직 블록(302)은 선택된 채널을 매체 채널 제어기(406)로 전달한다. 매체 채널 제어기(406)는 수신된 AM/FM 채널 선택에 응답하여 다수의 방식으로 반응하도록 UI 로직 블록(302)의 사용을 통해 사용자에 의해 구성될 수 있다. 일 실시예에서, 매체 채널 제어기(406)는 특정 AM/FM 채널 선택과 관련될 수 있는 대응하는 어떠한

사용자 선호 데이터를 위해 데이터베이스(308)를 자동으로 검색할 수 있다. 예를 들면, 특정 무선방송국으로의 사용자의 튜닝 명령에 응답하여 매체 채널 제어기(406)가 브라우저(310)로 하여금 WWW 서버(230)를 통해 관련된 URL에 접속하도록, URL은 선택된 무선 채널과 이전에 관련되어 있을 수 있다.

일단 브라우저(310)에 의해 접속되면, WWW 서버(230)는 예를 들면, 위에서 논의된 WAP 푸시 골격구조를 통해, 또는 대안적으로 HTML 응답 다음에 오는 HTTP/GET 동작을 통해, URL에 의해 지시된 Web 페이지내에 포함된 모든 콘텐트를 브라우저(310)로 다운로드한다. 일 실시예에서, 브라우저(310)는 웹 페이지 콘텐트들의 디스플레이가 일어나기 전에 웹 페이지 정보의 콘텐트들을 캐시(312)로 완전히 캐싱(cashe)하기 위해 즉, 이중 버퍼링 모드(double-buffered mode)로, UI 로직 블록(302)에 의해 구성될 수 있다. 일단 완전히 로딩되면, 브라우저(310)는 사용자에게로의 이후의 디스플레이를 위해, 캐시(312)로부터 이동 단말기(300)의 디스플레이 제어기(미도시)로 콘텐트들을 전달한다. 부가하여, 선택된 간격으로 WWW 서버(230)로부터 WAP 풀 동작(pull operation)을 자동으로 수행하도록, 브라우저(310)는 UI 로직 블록(302)에 의해 구성될 수 있다.

도 4는 본 발명의 원리들에 따른 일반적인 제1 및 제2 콘텐트 채널 설정의 블록도(400)를 기술하고 있다. 제1 채널(426)을 예시하기 위해, 최종 사용자(402)는 경로(418)를 통해 UI 로직(404)을 거쳐 이동 단말기(430)와 상호작용한다. 부가하여, 제2 채널(428)의 동작을 프로그래밍하기 위해, 최종 사용자(402)는 경로(418)를 통해 이동 단말기(430)를 구성할 수 있다. 제1 채널(426)의 제1 신호(432)는 제1 채널(426)의 경로(434)를 통해 피드백 신호의 흐름을 초래하는 어떠한 제어신호를 나타낸다. 제1 피드백 채널(426)의 피드백 신호(434)는 오디오 피드백 및/또는 비디오 피드백중 어느 하나일 수 있다. 유사하게, 제2 채널(428)의 제1 신호(436)는 제2 채널(428)의 경로(438)를 통해 피드백 신호의 흐름을 초래하는 어떤 제어 신호를 나타낸다. 제2 피드백 채널(428)의 피드백 신호(438)는 오디오 피드백 및/또는 브라우징 가능한 콘텐트 중 어느 하나일 수 있다.

일 실시예에서, 최종 사용자(402)는 듣고자 하는 무선 채널을 선택할 수 있으며, 여기서 제1 재생기(410)/제1 매체 스택(414)은 예를 들면, 도 3에서 도시된 무선 모듈(304)을 나타낸다. 그러한 경우에서, 제1 매체 스택(414)은 피드백 콘텐트, 즉 사용자 선택 주파수에서 RF 콘텐트를 수신하고; RF 콘텐트를 복조하며; 복조된 콘텐트를 경로(420)를 통해 최종 사용자(402)에게 제공하기 위해 필요한 무선 주파수(Radio Frequency, RF) 기능을 나타낸다. 최종 사용자는 예를 들면, 이동 단말기(430) 내부의 스피커들(미도시) 또는 이동 단말기(430)의 헤드폰 잭(미도시)에 연결된 헤드폰들을 통해 RF 콘텐트를 소비할 수 있다.

일단 최종 사용자(402)가 제1 채널로서 RF 전송을 선택하였음을 UI 로직(404)이 검출하면, 다른 조작이 필요한지를 결정하기 위해 UI 로직(404)은 선택적으로 매체 콘텐트 제어기(406)에 접속한다. 일 실시예에서, 최종 사용자(402)가 제1 채널 공급으로 선택한 무선 채널에 관해 존재할 수 있는 어떠한 제2 채널 편성(pairing)에 대하여, UI 로직(404)은 자동으로 매체 채널 제어기(406)에 접속해서 데이터베이스(408)를 검색한다. 무선 채널과 관련된 청각적인, 시각적인, 또는 브라우징 가능한 콘텐트가 URL로부터 검색되고, 제2 피드백 경로(438)를 통해 최종 사용자에게 전달될 수 있도록, 무선 채널은 예를 들면 그와 관련된 관련 URL을 가질 수 있다. 다른 실시예에서, 최종 사용자(402)는 데이터베이스(408)에서 검색된 URL에 접속하여야 하는지에 대해 UI 로직(404)에 의해 문의될 있다. 다른 실시예에서, 최종 사용자(402)는 제2 피드백 기능을 지원할 수 있는 어떠한 다른 청각적인, 시각적인, 또는 브라우징 가능한 소스에 대한 링크를 입력하도록 UI 로직(404)에 의해 문의될 수 있다. 만약 최종 사용자(402)가 관련된 제2 피드백 신호를 수신하고자 하는 그 또는 그녀의 소망을 확인하였다면, 제2 콘텐트 피드백 채널이 경로(438)를 통해 셋업되고, 궁극적으로는 경로(422)를 통해 최종 사용자(402)에 의해 소비될 수 있도록, 매체 제어기(406)는 경로(436)를 통해 제2 매체 소스와 접속하기 위해 신호(424)를 통해 제2 재생기(412) 및 제2 매체 스택(416)에 접속한다.

도 2 내지 도 4와 조합하여, 도 5의 메시지 흐름도(500)가 본 발명에 따른 예시적인 제1 및 제2 매체 콘텐트 채널 셋업의 더 나은 이해를 위해 제공된다. 이러한 예시에서, 최종 사용자는 그 또는 그녀의 이동 단말기를 사용해서 영역에 있는 그들이 좋아하는 음악 방송국으로 동조하기 원한다. 부가하여, 사용자는 특정 무선방송국과 관련된 웹 페이지에 의해 전달될 수 있는 어떠한 브라우징 가능한 콘텐트를 수신하고자 한다. 특정 무선 방송국은 전형적으로 재생중인 현재 노래의 아티스트 정보를 디스플레이하는 웹 페이지 콘텐트, 다른 URL들, 광고들 등과 관련된 어떠한 링크들을 제공한다.

따라서, 단계 502에서, 최종 사용자(402)는 이동 단말기의 디스플레이를 사용해서 경로(420)를 통해 팝업 메뉴가 사용자에게 제공되도록, 키보드 입력, 터치 스크린 입력, 음성 명령, 가속/틸트(tilt) 명령 등을 사용해서 경로(418)를 통해 UI 로직(404)과의 통신을 설정한다. 팝업 메뉴는 최종 사용자(402)가 이전에 입력한 모든 프리셋 무선 방송국 엔트리들을 디스플레이한다. 그러면, 최종 사용자(402)는 그 또는 그녀의 선택의 UI 로직(404)을 나타내기 위해 프리셋 채널들중 하나를 밝게 한다. 그러면, 무선 모듈(304)이 그 내부의 RF 튜너를 사용자가 원하는 무선 방송국으로 튜닝할 수 있도록, UI 로직(404)은 선택된 프리셋 채널을 무선 모듈(304)로 전송한다. 일단 무선 모듈(304)이 사용자가 원하는 무선 방송국으로 튜

닝하면, 무선 모듈은 송신기(234)에 의해 전송되는 무선 방송에 민감하게 되며, 이동 단말기(430)의 내부 스피커들(미도시) 또는 이동 단말기(430)의 헤드폰 잭(미도시)으로 복조된 무선 정보를 전달한다. 그러면, 최종 사용자(402)는 단계 504에서와 같이 제1 채널(426)의 제1 피드백 경로(434)를 통해 전달되고, 송신기(234)에 의해 전송된 전달된 오디오 콘텐트를 자유롭게 소비한다.

단계 506에서, 매체 채널 제어기(406)는 단계 502에서 최종 사용자(402)에 의해 입력된 프리셋 무선 선택을 자동으로 검색한다. 매체 채널 제어기(406)는 다음에 무선 선택과 데이터 베이스(408)에 포함될 수 있는 어떠한 대응하는 정보를 비교한다. 상기 룩업은 단계 502에서 최종 사용자(402)에 의해 선택된 무선 방송국의 홈 페이지인, WWW 서버(230)에 의해 호스팅된 웹 페이지와 관련된 URL을 발견하도록 한다. UI 로직(404)은 다음에 데이터 베이스(408)로부터 검색된 URL에 의해 지시된 홈 페이지 콘텐트들로 이루어진 제2 콘텐트 채널을, 그 또는 그녀가 수신하고자 하는지에 대해 최종 사용자(402)에게 문의한다.

최종 사용자(402)는 긍정적으로 답변하였기 때문에, 매체 채널 제어기(406)에 의해 브라우저(310)가 경로(424)를 통해 예시된다. 브라우저(310)는 예를 들면, WWW 서버(230)로부터 HTML 정보를 풀(pool)할 수 있는 어떠한 WAP, HTML, XHTML, 또는 WML(Wireless Markup Language) 가능 브라우저일 수 있다. 현재의 시나리오에서, 단계 502에서 선택된 무선 방송국의 홈 페이지에 대응하는 WWW 서버(230)에 의해 호스팅되는 URL로부터의 WAP 풀 요청(WAP pull request)은 단계 508에서처럼 수행된다.

WAP 풀 요청은 단계 510의 대응하는 WAP 푸시 메시지를 초래한다. WAP 푸시 메시지는 위에서 논의된 바와 같이 WWW 서버(230)로부터 MMSC(220)로의 메시지(240)에 대응할 수 있으며, 이것은 전달 통지(242) 및 메시지(244)에 의해 표기되는 이후의 WAP/GET 동작을 초래한다. 상기 정보는 제2 채널(428)의 제2 콘텐트 피드백 경로(428)를 통해 이동 단말기(430)로 전달되고, 이어서 단계 512에서 경로(422)를 통한 이동 단말기(430)의 디스플레이를 통해 최종 사용자(402)로 전달된다.

제1 매체 콘텐트 채널의 형성 및 관련된 제2 매체 콘텐트 채널의 이후의 자동 형성과 함께, 그의 대응하는 WWW 서버를 통해 무선 방송국에 참여하는 동안, 사용자는 무선 방송 콘텐트를 청취할 수 있다. 예를 들면, 무선 방송국들은 콘텐트들을 때때로 제공할 수 있으며, 이에 의해 그의 청취자들은 현재 재생되는 노래를 식별하도록 촉구된다. 상기 노래 및 그의 아티스트를 올바르게 식별한 첫번째 청취자는 예를 들면, 무선 방송국에 의해서 현재 제공되는 어떠한 상이라도 탈 수 있다. 본 발명의 사용자는 자동으로 그러한 콘테스트에 참여할 수 있는데, 왜냐하면 무선 방송국의 방송에 튜닝하는 행위는 자동으로 제2 매체 콘텐트 채널을 예시하기 때문이다. 부가적으로, 무선 방송국은 그의 홈 웹 페이지에 의해 링크된 광고들을 사용함으로써, 본 발명의 사용자를 끌어들이기 위한 개선된 능력을 전시한다. 예를 들면, 사용자는 제2 매체 콘텐트 채널에 의해 전달된 간청(solicitation)에 이끌려 광고자의 홈 웹 페이지들로 갈 수 있으며, 따라서 본 발명의 사용자 및 그의 비즈니스 파트너들간 추가적인 상업 대로(avenue of commerce)를 생성한다.

일 실시예에서, 브라우저(310)는 미리 정의된 간격으로 WAP 풀 요청들을 발행하도록 구성된다. 그러한 경우에, 최종 사용자(402)에게 디스플레이되는 정보가 전체 URL의 콘텐트가 이동 단말기(430)로 다운로드 완료된 이후에만 디스플레이되도록, 제2 재생기(412)는 무선 방송국의 URL로부터 수신되는 HTML 콘텐트를 이중 버퍼링할 수 있다. 그 시간까지, 이전의 다운로드드로부터 수집한 정보는 최종 사용자(402)에게 디스플레이된다. 결과적으로, 최신 정보가 최종 사용자에게 전달되고, 무결정성으로(seamlessly) 디스플레이될 수 있다. 미리 정의된 다운로드 간격은 최종 사용자(402)에 의해 구성될 수 있으며, 또는 대안적으로 이동 단말기(430)의 프로비저닝(provisioning) 동안 구성될 수 있다. 대안적으로, 다운로드 간격은 적절한 헤더로 또는 WWW 서버(230)로부터 수신된 페이지 데이터의 부분으로서 WWW 서버(230)에 의해 구성될 수 있다. 상기 헤더는 또한 다음의 풀 타임(pull time)을 지정할 수 있으며, 또는 역으로 다음이 풀 간격이 개시되기 전에 경과된 시간의 양을 세팅하기 위해 브라우저 재생기에 의해 사용되는 지연 변수(delay variable)를 지정할 수 있다.

WWW 서버(230)에 의해 결정된 소정의 간격으로 WAP 푸시 싸이클을 사용함으로써, 여전히 다른 대안들은 풀 간격(pull interval)이 WWW 서버(230)에 의해 제어되도록 허용한다. 예를 들면, WWW 서버(230)는 다운로드 간격 제어를 제공하는데 더 적합할 수 있는데, 왜냐하면 WWW 서버(230)는 무선 방송국(234)의 무선 방송들에 동기되기 때문이다. 예를 들면, 콘테스트 정보가 웹 싸이트 등에서 이용 가능할 때, WWW 서버(230)는 현재 재생된 노래의 아티스트 정보가 바뀐 시점을 정확히 안다.

만약 제2 채널이 타임아웃 주기내에 액세스되지 않았다면 제2 채널 리소스들이 자유로울 수 있도록(freed up), 제2 채널 풀 기능에 대한 타임아웃(timeout)을 설정하는 것이 가능하다. 이것은 최종 사용자(402)가 경로(422)를 통해 제2 콘텐트

피드백을 액세스한 이후로 일어난 시간 량을 검출함으로써, UI 로직(404)내에서 구현될 수 있다. 만약 시간 량이 타임아웃 주기를 초과한다면, 다음에 UI 로직(404)은 최종 사용자(402)에게 사용자에게 그 또는 그녀가 제2 콘텐트 소비를 유지할지의 선호도에 관해 문의하는 경고 메시지를 예시할 수 있다.

제2 재생기(412)가 브라우저인 경우에, 최종 사용자(402)가 제2 채널의 포커스(focus)를 구성할 수 있도록, 구성 옵션이 UI 로직(404)에 의해 허용된다. 예를 들면, 상기 포커스(focus)는 최근에 갱신된 제2 콘텐트 또는 마지막 최종 사용자가 선택한 제2 콘텐트에 위치될 수 있다. 부가적으로, 제2 콘텐트가 변화했음을 상기 브라우저가 검출할 때, 청각적인, 시각적인, 또는 촉각적인 알람이 또한 최종 사용자(402)에 의해 구성될 수 있다. 최근에 갱신된 제2 채널 콘텐트가 수신중인 동안에도, 제2 채널 콘텐트 포커스 및 이동 단말기의 스크린상의 공간적 위치가 빈틈이 없도록(in tact), 최종 사용자(402)는 완전히 수신된 콘텐트에 기초하여 제2 콘텐트를 브라우징하도록 허용된다. 일 실시예에서, 브라우저는 메인 페이지 콘텐트의 차이점들을 검출하거나 또는 상기 메인 페이지 콘텐트에 실장될 수 있는 링크들을 검사함으로써, 제2 소스 콘텐트에서의 변화들을 검출할 수 있다.

브라우저가 자바스크립트 또는 유사한 강력한 스크립팅 지원을 제공하는 경우에, 콘텐트는 웹 페이지들의 배경 로딩을 구현하는 자바스크립트 코드를 사용해서 자동으로 풀(pulled)될 수 있으며, 이동 단말기의 스크린상에 갱신된 페이지 콘텐트들을 제공한다. 부가하여, 이동 푸시 능력을 가진 브라우저들은 최근에 변경된 콘텐트를 단말기로 푸시하기 위해 웹 서버에 의존할 수 있으며, 이것은 무선 링크들의 효율적이며 효과적인 사용을 가능하게 하는데, 그 이유는 정보는 웹 페이지 정보가 변경한 때에만 푸시되기 때문이다.

그러나, 브라우저가 자바스크립트 기능을 보이지 않는 경우에는 제1/제2 콘텐트 제어의 동작은 도 6의 흐름도(600)에 의해 예시될 수 있다. 특히, 제1 콘텐트 채널 선택은 단계 602에서 수행된다. 매체 채널 제어기는 단계 604에서 제1 콘텐트 채널 선택을 검출하고, 제2 콘텐트 채널이 제1 채널 선택과 관련되었는지를 결정한다. 만약 관련된 제2 콘텐트 채널이 없다면, 단계 606에서 제2 채널 선택을 원하는지를 사용자에게 문의한다. 만약 없다면, 채널 매체 모드는 입력되지 않으며, 채널 모드는 종료한다. 만약 다른 한편으로, 제2 채널 선택이 자동으로 또는 수동으로 이루어졌다면, 매체 채널 모드가 단계 608에서 입력되며, 이에 의해 제2 콘텐트 채널을 인스턴스화(instantiate)하기 위해 필요한 파라미터들이 검색된다.

다음에, 웹 페이지 콘텐트는 단계 610에서 제2 콘텐트 채널 파라미터들에 따라 제1 비주얼 버퍼(visual buffer)에 풀(pool)되며, 이어서 이동 단말기의 디스플레이에 디스플레이된다. 다음에 브라우저는 단계 612에서 갱신 타이머(refresh timer)가 만료되었는지를 검사한다. 시간이 만료되었다면, 웹 페이지 콘텐트는 단계 614에서처럼 제2 버퍼에 다시 풀되며, 갱신 타이머는 리셋된다. 다음에, 브라우저는 단계 616에서 최근에 풀된 콘텐트(pooled content)가 디스플레이된 콘텐트와 다른지를 결정한다. 만약 다르지 않다면, 갱신 타이머는 단계 622에서 다시 검사되고, 갱신 타이머가 만료되었다면, 새로운 콘텐트가 단계 614에서 풀된다. 만약 콘텐트가 변경되었다면, 변화된 콘텐트는 단계 618에서와 같이, 제2 비주얼 버퍼(visual buffer)로 전달된다. 일단 전체 콘텐트가 전달되면, 사용자의 디스플레이는 단계 620에서 제1 비주얼 버퍼로부터 제2 비주얼 버퍼로 무결정성으로 천이된다.

만약 사용자가 제2 콘텐트 채널과 상호작용을 계속한다면, 다음에 브라우저는 사용자 선택 포커스(focus)를 갱신된 제2 콘텐트 채널상에서 유지한다. 포커스 타임아웃의 만료까지 상기 포커스가 갱신된 제2 콘텐트 채널과 함께 유지되도록, 사용자는 포커스 타임아웃을 구성할 수 있다. 포커스 타임아웃의 만료시에, 상기 포커스는 사용자에 의해 선택된 최종 매체 콘텐트 채널로 이동될 것이다. 만약 사용자가 어떠한 매체 콘텐트 채널과의 상호작용을 중지한다면, 구성 가능한 시간 량이 지난 후에, 매체 채널 모드에서 탈출될 것이다.

도 4에서 기술된 바와 같이 제1/제2 매체 콘텐트 선택은 상당히 융통성이 있다. 예를 들면, 이전 예시의 제1/제2 매체 콘텐트 선택 규칙들은 교환될 수 있다. 바꾸어 말하면, 브라우징 가능한 콘텐트는 제1 매체 스택(414)을 사용해서 검색될 수 있으며, 이어서 제1 재생기(410)에 포함된 브라우저를 통해 디스플레이된다. 일단 URL이 선택되면, UI 로직(404)은 이후의 데이터 베이스(408) 룩업을 위해 매체 채널 제어기(406)에 URL을 제출할 수 있다. 예를 들면, 데이터 베이스(408)는 URL에 속하는 대응하는 무선 방송국이 존재하는지를 검색할 수 있다. 선택적으로, 최종 사용자(402)는 무선 방송이 제2 콘텐트 채널(428)을 통해 전송되어야 한다고 요청할 수 있다. 이러한 경우에, 제2 재생기(412)/제2 매체 스택(416)은 최종 사용자(402)가 제2 콘텐트 피드백 경로(422)를 통해 무선 방송을 소비하기 위해 필요한 재생 기능들, 복조(demodulation), 및 필요한 튜닝을 포함한다.

다른 실시예에서, 제1 콘텐트 피드백 경로는 도 2에서 기술된 바와 같이 이동 단말기(430)로부터 완전히 분리될 수 있다. 특히, 이동 단말기(216)는 TV(232)와 함께 위치한 사용자에 의해 동작중이다. TV(232)는 TV 전송국(236)의 전송 반경내에 있으며, WWW 서버(226)에 의해 호스팅되는 웹 페이지는 TV 스테이션(236)의 TV 방송들과 동기된다. 그러한 경우에, 이동 단말기(216)에서 실행되는 그 또는 그녀의 브라우저를 통해 WWW 서버(228)를 제2 매체 콘텐트 채널로서 액세

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스하는 동안에, 이동 단말기(216)의 사용자는 제1 매체 콘텐트 채널로서 TV(232)로부터의 방송을 볼 수 있다. 올바른 URL은 TV(232)의 스크린에 포스팅될 것이며, 이후의 URL 액세스를 위해 이동 단말기(216)의 브라우저의 URL 텍스트 기입 박스에 타이핑된다.

대안적인 실시예에서, 사용자에 친숙한 어드레스가 TV(232)에 디스플레이될 있고, 추후의 사용을 위해 이동 단말기(216)의 사용자는 이러한 어드레스를 이동 단말기(216)에 타이핑할 것이다. 다음에 제2 매체 콘텐트는 실장된 또는 분리된 다운로드 가능한 HTML 브라우저를 통해 추후에 소비될 수 있고, 따라서 일반적인 기술들(horizontal technologies)을 몰아내기 위해 채널 생성자에게 주어진 표현 전력(expression power)을 최대화할 수 있다. 만약 제2 매체 소비를 위해 더욱 많은 표현 전력이 필요하다면, 별개의 심비안 OS 어플리케이션(Symbian OS application)을 이동 단말기(216)에 다운로드하거나, 또는 최종 사용자를 위한 UI를 제공하는 자바 미드렛(Java midlet)을 다운로드 하고 또한 콘텐트를 호스팅하는 서버에 접속하는 것이 가능하다.

일반적으로, 제1 콘텐트 및 제2 콘텐트를 위한 액세스 방법 및 통신 채널은 분리되거나 또는 동일할 수 있다. 다시 말하면, 예를 들어 제1 재생기(410) 및 제2 재생기(412)는 동일한 재생기이거나 또는 다른 재생기들일 수 있다. 제1 및 제2 콘텐트 채널들 모두를 위해 하나의 재생기가 사용되는 일 예시에서, 제2 매체 채널 모드를 사용해서 온라인 라디오를 들으면서, RealOne과 같은 다목적 재생기가 제1 매체 채널 모드에서 매체 콘텐트를 브라우징하는데 사용될 수 있다. 다른 실시예에서, 제1 브라우징 세션동안 방문된 웹 페이지에 의해 제공된 링크로부터의 광고들이 제2 모드에서 다운로드되고, 보여지는 동안, 모바일 브라우징은 RealOne 재생기를 통해 제1 모드에서 수행될 수 있다.

제1 및 제2 콘텐트는 가시적이거나, 가청일 필요는 없으며, 또는 다른 한편으로 동시에 소비될 필요는 없다. 예를 들면, 제1 및 제2 매체 콘텐트 채널들간에 원하는 대로 앞뒤로 토글링(toggle)하는 것이 가능하다. 일 실시예에서, 제1 및 제2 콘텐트 채널들 모두는 콘텐트에서 가시적이며, 다양한 포맷들로 이동 단말기의 디스플레이 장치에서 혼합될 수 있다. 예를 들면, PIP(Picture-In-Picture) 포맷은 제2 콘텐트 채널이 제2 윈도우 프레임에서 디스플레이되는 동안, 하나의 윈도우 프레임을 사용해서 제1 콘텐트 채널을 디스플레이하는데 사용될 수 있다. 이동 단말기 사용자가 동시 또는 필요한 경우에 별도로 제1 및 제2 채널들로부터 효율적으로 콘텐트를 소비하도록 허용하기 위해, 제1/제2 매체 콘텐트 표현의 다수의 조합들은 이동 단말기의 디스플레이, 스피커들, 헤드폰 잭, 촉각 큐들(tactile queues) 등을 사용해서 구현될 수 있다는 점은 당해 분야의 숙련자들중 하나에게는 명백하다.

제1 및 제2 매체 콘텐트 채널들은 도 7의 채널 액세스 방법 블록도(700)에서 기술된 그들의 대응하는 액세스 방법들과 단단히 결합되어 있지 않다는 점에 주목해야 한다. 재생기(702)는 아날로그 AM/FM, MP3, MPEG(Movimg Pictures Expert Group, MPEG) 오디오 등을 포함하는 어떠한 오디오 포맷이라도 가상적으로 재생 가능한 어떠한 매체 재생기를 나타낼 수 있다. 재생기(704)는 몇 가지만 예를 들면, 윈도우미디어(WindowMedia), 퀵타임(QuickTime), 버전 엠펙 버전 4(MPEG-4), 및 DVD(Digital Versatile Disk)를 포함하는 어떠한 비디오 매체 포맷을 가상적으로 재생 가능한 어떠한 재생기를 나타낼 수 있다.

매체 재생기들(702 또는 704) 중 하나는 제1 매체 재생기로서 선택될 수 있으며, 반면 다수의 액세스 방법들이 매체 콘텐트를 위해 사용될 수 있다. 액세스 방법도(700)는 본 발명에 따라 이용 가능한 다수의 오디오/비디오 액세스 방법들을 기술하고 있다. 오디오 채널 선택기(710)는 로컬 오디오, AM/FM 튜너, 디지털 라디오 튜너, 위성 라디오 튜너, 스트리밍 네트 오디오, 또는 DVB-T(Digital Video Broadcasting - Terrestrial) 라디오 공급들(feeds)을 포함하는 한 세트의 오디오 포맷들로부터 어떠한 오디오 포맷이라도 선택할 수 있다. 유사하게, 비디오 채널 선택기(712)는 DVB-T, 스트리밍 네트 비디오, 또는 로컬 비디오 공급들(feeds)을 포함하는 한 세트의 비디오 포맷들로부터 어떠한 비디오 포맷이라도 선택할 수 있다. 도시될 수 있는 바와 같이, 재생기 및 매체 콘텐트가 호환 가능한 한, 매체 액세스에 대한 어떠한 재생기의 조합이라도 수용 가능하다.

일단 제1 매체 채널이 선택되었다면, 데이터 베이스(706)와 조합된 매체 채널 제어기(708)는 미리 정의된 옵션(options)에 따라 대응하는 제2 매체 채널을 선택할 수 있다. 일반적으로, 매체 채널 제어기(708)는 제2 채널이 지정되었는지를 검사하며, 지정되었다면 제2 채널이 활성화되어야 하는지를 검사한다. 제1 및 제2 콘텐트 모두는 로컬 저장부로부터 추출될 수 있다. 제1 콘텐트가 국부적으로 저장되었지만, 제2 콘텐트는 그렇지 않은 경우에, 제2 콘텐트는 서버로부터 풀(pull)되어야 한다. 그와 같은 경우에, 풀된 콘텐트를 공급하는 서버는 국부적으로 저장된 제1 콘텐트와 관련된 타이밍을 유지해야 한다.

본 발명은 모듈 발명이며, 이에 의해 이동 단말기내의 프로세스 기능들은 본 발명을 구현하는데 사용될 수 있다. 이동 장치들은 무선 통신이 가능한 휴대용 계산 장치들 외에도 무선/셀룰러 전화들, 개인 휴대용 정보 단말기들(Personal Digital Assistants, PDAs), 또는 다른 무선 핸드셋들과 같은 어떠한 타입의 무선 장치라도 될 수 있다. 이러한 지상통신선

(landline) 및 이동 장치들은 본 발명에 의해 제공되는 기능 외에도 기존의 장치 활동을 관리하고 제어하기 위해 소프트웨어 및 연산 회로를 사용한다. 여기서 기술된 다양한 매체 채널 제어 기능들을 수행하기 위해, 하드웨어, 펌웨어, 소프트웨어 또는 그들의 조합이 사용될 수 있다. 본 발명에 따른 동작들을 수행할 수 있는 이동 단말기 연산 시스템의 대표적인 예시는 도 8에 기술되어 있다. 당해 분야의 숙련자들이라면, 예시적인 이동 연산 환경(800)은 그러한 이동 장치들과 관련될 수 있는 일반적인 기능들만을 나타내며, 또한 지상통신선 연산 시스템들(landline computing systems)은 단지 그러한 동작들을 수행하기 위한 연산 회로만을 포함한다는 점을 이해할 것이다.

본 발명에 따른 매체 채널들을 제어하기에 적합한 예시적인 이동 연산 장치(800)는 다수의 다른 타입들의 무선 장치들과 결합될 수 있다. 대표적인 이동 연산 장치(800)는 마이크로 프로세서, 축소된 명령어 세트 컴퓨터(Reduced Instruction Set Computer, RISC), 또는 다른 중앙 처리 모듈과 같은 프로세싱/제어 유닛(802)을 포함하고 있다. 상기 프로세싱 유닛(802)은 하나의 장치일 필요는 없으며, 하나 이상의 프로세서들을 포함할 수 있다. 예를 들면, 프로세싱 유닛은 마스터 프로세서 및 상기 마스터 프로세서와 통신하기 위해 결합된 관련 슬레이브 프로세서들을 포함할 수 있다.

프로세싱 유닛(802)은 이동 단말기의 기본적 기능들을 제어하며, 또한 매체 채널 제어기(826), 데이터 베이스(828), 제1 재생기(830), 및 제2 재생기(832)에 의해 나타난 본 발명과 관련된 그러한 기능들을 또한 제어한다. 따라서, 프로세싱 유닛(802)은, 매체 채널 제어기(826)와 관련하여, 본 발명과 관련된 제1 및 제2 매체 채널들을 제어할 수 있다. 데이터 베이스(828)내에 포함된 파라미터들에 따라, 제1 콘텐트 채널들은 제1 재생기(830)에 의해 처리되며, 제2 콘텐트 채널들은 제2 재생기(832)에 의해 처리된다. 프로그램 저장부/메모리(804)는 또한 이동 단말기의 어플리케이션들 및 기능들을 수행하기 위한 프로그램 모듈들 및 운영 시스템을 포함한다. 예를 들면, 프로그램 저장부는 하나 이상의 ROM(Read Only Memory), 플래시 ROM, 프로그램 가능 및/또는 삭제 가능 ROM, RAM(Random Access Memory), 가입자 인터페이스 모듈(Subsciber Interface Module, SIM), 무선 인터페이스 모듈(Wireless Interface Module, WIM), 스마트 카드, 또는 다른 제거 가능한 메모리 장치 등을 포함할 수 있다.

본 발명의 일 실시예에서, 저장부/메모리(804)와 관련된 프로그램 모듈들은 이동 단말기의 파워 다운시에 정보가 손실되지 않도록, 비휘발성 전기적 소거 및 프로그램 가능 읽기 전용 기억 장치(electrically -erasable, programmable read only memory, EEPROM), 플래시 ROM 등에 저장된다. 기존의 이동 단말기 동작들 및 본 발명에 따른 동작들을 수행하기 위한 적절한 소프트웨어는 인터넷 및 중간의 무선 네트워크(들)과 같은 하나 이상의 네트워크들을 통해 전기적으로 다운로드 되는 것처럼, 데이터 신호들을 통해 이동 연산 장치(800)로 또한 전송될 수 있다.

프로세서(802)는 또한 이동 단말기와 관련된 사용자-인터페이스(806) 요소들과 연결된다. 이동 단말기의 사용자-인터페이스(806)는 예를 들면, 액정표시장치와 같은 디스플레이(808), 키패드(810), 스피커(812), 및 마이크로폰(814)를 포함할 수 있다. 이것들 및 다른 사용자-인터페이스 구성요소들은 당해 분야에서 알려진 바와 같이 프로세서(802)에 연결된다. 음성 명령들, 스위치들, 터치 패드/스크린이나, 포인팅 장치, 트랙볼(trackball), 조이스틱, 및 어떠한 다른 사용자 인터페이스 매커니즘을 사용하는 그래픽 유저 인터페이스와 같은 다른 사용자-인터페이스 매커니즘들이 사용될 수 있다.

이동 연산 장치(800)는 무선 전송을 수행하기 위한 기존의 회로를 또한 포함하고 있다. 아날로그-디지털(A/D) 변환, 디지털-아날로그(D/A) 변환, 음성 코딩/디코딩, 암호/암호해독, 오류 검출 및 보정, 비트 스트림 번역, 필터링 등을 포함하는 다양한 기능들을 수행하기 위해, 디지털 신호 프로세서(Digital Signal Processor, DSP)(816)가 사용될 수 있다. 일반적으로 안테나(820)에 연결되는 트랜시버(818)는 외부로 나가는 무선 신호들(822)을 전송하며, 무선 장치와 관련되어 들어오는 무선 신호들(824)을 수신한다.

도 8의 이동 연산 장치(800)는 본 발명의 원리들이 적용될 수 있는 연산 환경의 대표적인 예시로서 제공된다. 여기서 제공된 기술로부터, 당해 분야의 숙련자들이라면 본 발명이 다양한 다른 현재 알려진 그리고 미래의 이동 및 지상통신선 연산 장치들에 동등하게 적용 가능하다는 점을 이해할 것이다. 예를 들면, 데스크톱 연산 장치들은 프로세서, 메모리, 사용자 인터페이스, 및 데이터 통신 회로부를 유사하게 포함한다. 따라서, 본 발명은 데이터가 네트워크를 통해 전송될 수 있는 어떠한 알려진 연산 구조에서도 적용이 가능하다.

여기서 제공된 설명을 사용해서, 본 발명은 프로그래밍 소프트웨어, 펌웨어, 하드웨어 또는 이들의 어떠한 조합을 생성하기 위한 엔지니어링 기술들 및/또는 표준 프로그래밍을 사용함으로써, 기계, 프로세스, 또는 제품으로서 구현될 수 있다. 컴퓨터로 독출 가능한 프로그램 코드를 가지는 어떠한 결과적인 프로그램(들)은 디스크들, 광 디스크들, 제거 가능한 메모리 장치들, RAM, ROM, PROM들 등과 같은 반도체 메모리들에 구현될 수 있다. 본 발명과 관련된 기능들을 수행하기 위한 코드를 포함하는 제품들은 어떠한 컴퓨터로 사용 가능한 매체 또는 그러한 프로그램을 전송하는 어떠한 전송 매체에 영구적으로 또는 일시적으로 존재하는 컴퓨터 프로그램을 포함하려는 의도이다. 전송 매체는 무선/전파 통신 네트워크들, 인터넷, 인트라넷들, 전화/모뎀 기반의 네트워크 통신, 하드와이어/케이블(hard-wired/cabled) 통신 네트워크, 위성 통신, 및

다른 고정 또는 이동 네트워크 시스템/통신 링크들을 통한 전송을 포함하지만, 그에 제한되지는 않는다. 여기서 제공된 설명으로부터, 당해 분야의 숙련자들이라면 기술된 바와 같이 생성된 소프트웨어와 본 발명에 따른 매체 콘텐트 채널들을 생성하기 위한 적절한 범용의 또는 특정 목적의 컴퓨터 하드웨어를 쉽게 결합할 수 있을 것이다.

본 발명의 다양한 실시예들의 이전의 설명은 기술 및 설명의 목적으로 제시되었다. 개시된 정확한 형태로 본 발명의 과장하거나 제한하려는 의도는 아니다. 많은 변형들 및 수정들이 위의 교지(teaching)의 견지에서 가능하다. 따라서, 본 발명의 범위는 상세한 설명으로 제한되지는 않으며, 오히려 여기에 첨부된 청구항들로부터 결정된다.

도면의 간단한 설명

도 1은 일반적인 네트워크 아키텍처를 기술하고 있다.

도 2는 본 발명에 따른 예시적인 통신 네트워크이다.

도 3은 본 발명에 따른 이동 단말기의 기능적인 블록도를 기술하고 있다.

도 4는 본 발명에 따른 일반적인 제1 및 제2 콘텐트 채널 설정을 기술하고 있다.

도 5는 본 발명에 따른 메시지 흐름도를 기술하고 있다.

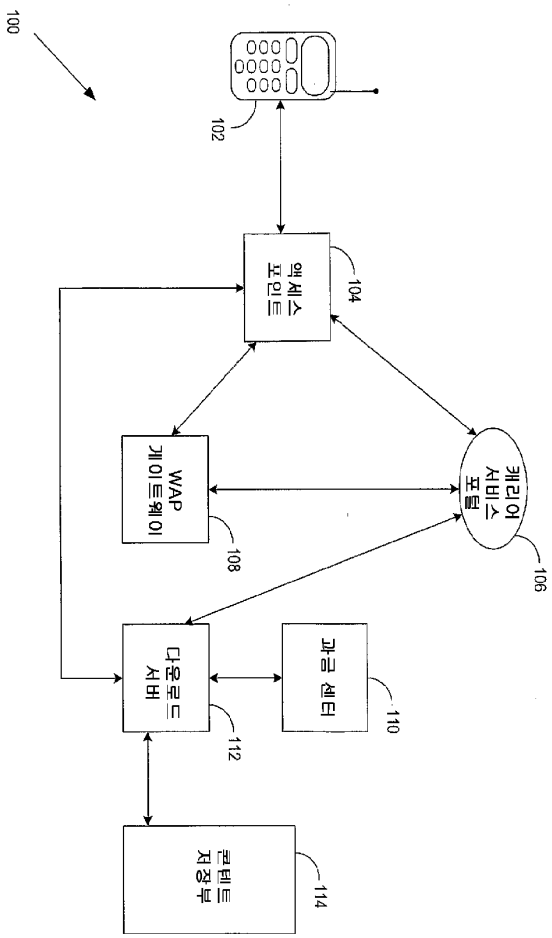
도 6은 본 발명에 따른 흐름도를 기술하고 있다.

도 7은 본 발명에 따른 예시적인 채널 액세스 방법 블록도를 기술하고 있다.

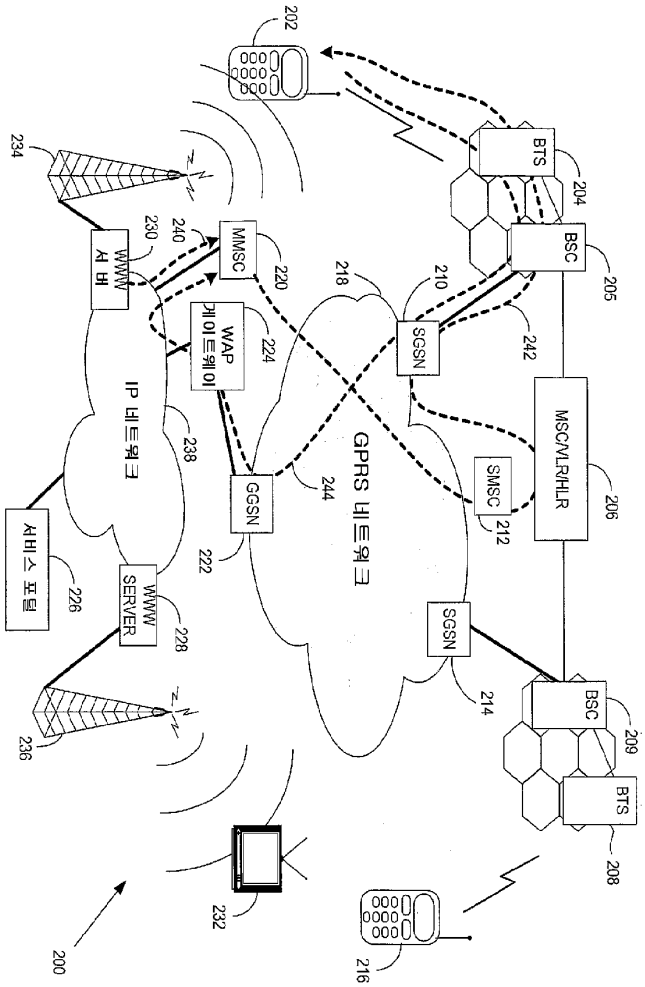
도 8은 본 발명에 따른 예시적인 이동 계산 환경을 기술하고 있다.

도면

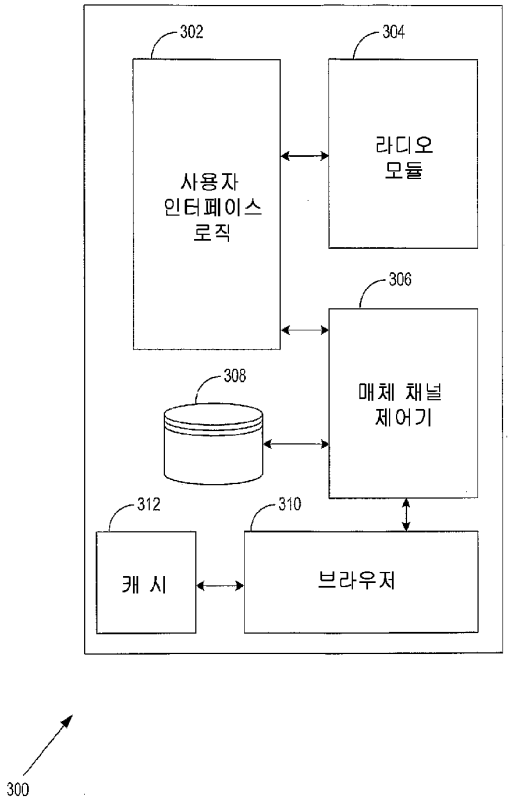
도면1


100
102
액세스 포인트
104
WAP 게이트웨이
108
캐리어 서비스 포털
106
다운로드 서버
112
과금 센터
110
콘텐트 저장부
114

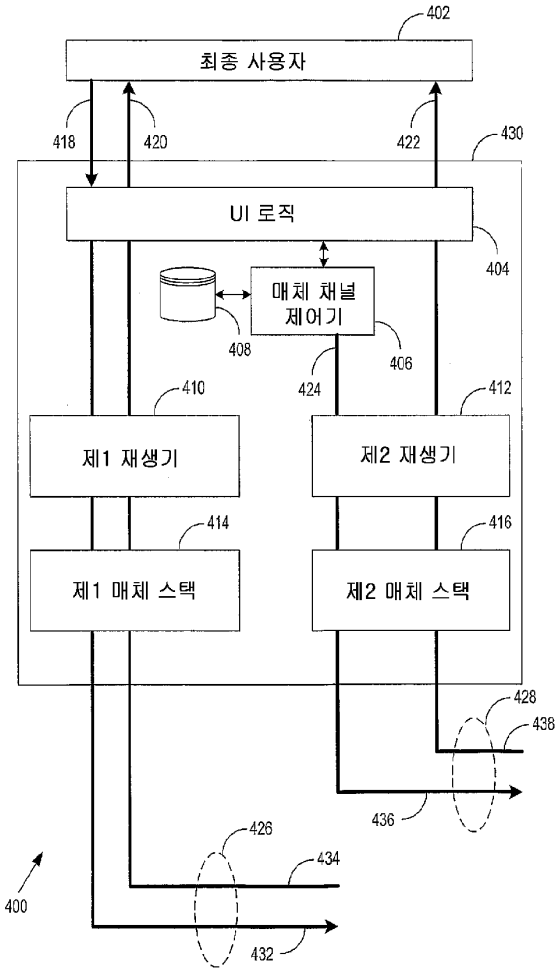
도면2


202
BTS
204
BSC
205
234
230
240
MMSC
220
218
210
WWW
서 버
WAP
게이트웨이
224
SGSN
242
IP 네트워크
238
GPRS 네트워크
MSC/VLR/HLR
206
SMSC
212
GGSN
244
222
서비스 포털
226
WWW
SERVER
228
SGSN
214
BSC
209
BTS
208
236
232
200
216

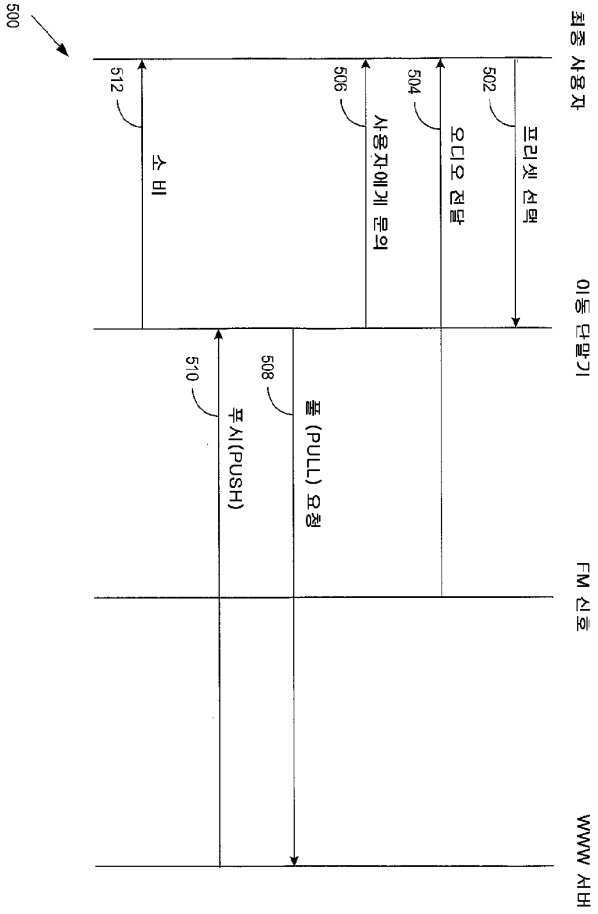
도면3



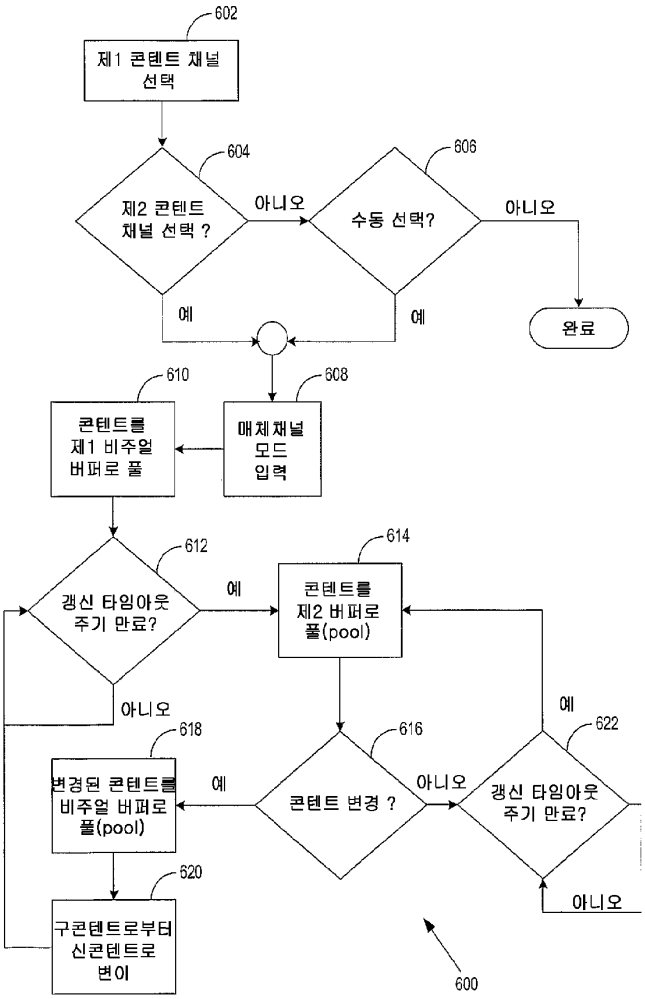
도면4


402
최종 사용자
418
420
422
430
UI 로직
404
매체 채널
제어기
408
406
424
410
412
제1 재생기
제2 재생기
414
416
제1 매체 스택
제2 매체 스택
428
438
436
426
434
400
432

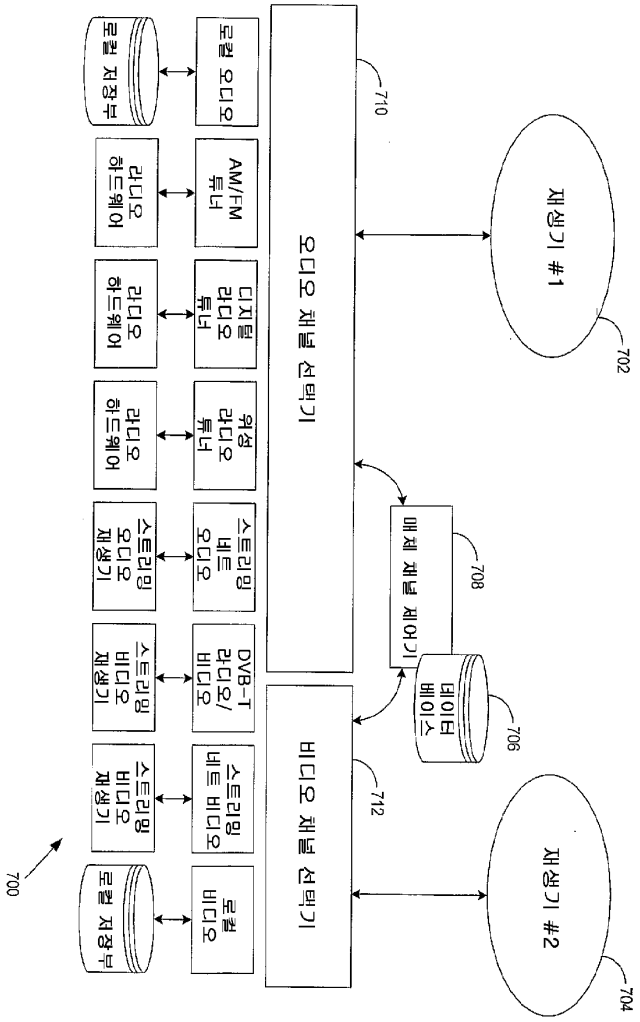
도면5


500
최종 사용자
이동 단말기
FM 신호
WWW 서버
502
프리셋 선택
504
오디오 전달
506
사용자에게 문의
512
소 비
508
풀 (PULL) 요청
510
푸시(PUSH)

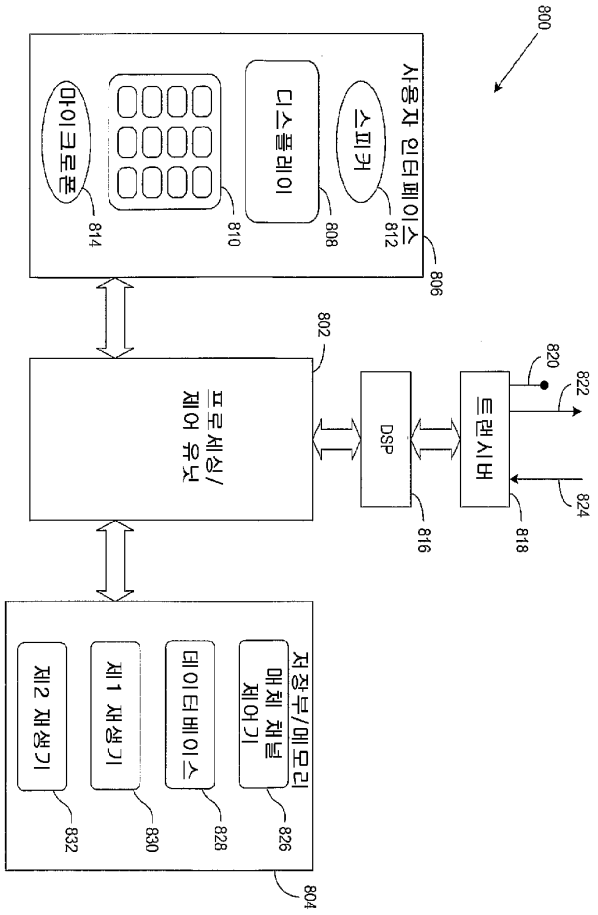
도면6


602
제1 콘텐트 채널 선택
604
제2 콘텐트 채널 선택 ?
아니오
606
수동 선택?
아니오
예
예
완료
610
콘텐트를 제1 비주얼 버퍼로 풀
608
매체채널 모드 입력
612
갱신 타임아웃 주기 만료?
예
614
콘텐트를 제2 버퍼로 풀(pool)
아니오
618
변경된 콘텐트를 비주얼 버퍼로 풀(pool)
예
616
콘텐트 변경 ?
아니오
622
갱신 타임아웃 주기 만료?
예
아니오
620
구콘텐트로부터 신콘텐트로 변이
600

도면7


700
로컬 저장부
로컬 비디오
스트리밍 비디오 재생기
스트리밍 비디오
스트리밍 비디오 재생기
DVB-T 라디오/ 비디오
스트리밍 오디오 재생기
스트리밍 오디오
라디오 하드웨어
웹캐 라디오 튜너
라디오 하드웨어
디지털 라디오 튜너
라디오 하드웨어
AM/FM 튜너
로컬 오디오
로컬 저장부
비디오 채널 선택기
오디오 채널 선택기
710
712
매체 채널 제어기
708
데이터베이스
706
재생기 #1
702
재생기 #2
704

도면8


800
사용자 인터페이스
806
스피커
812
디스플레이
808
810
마이크로폰
814
802
프로세싱/
제어 유닛
DSP
816
트랜시버
818
820
822
824
저장부/메모리
804
매체 채널
제어기
826
데이터베이스
828
제1 재생기
830
제2 재생기
832

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Abstract

A system and methods for accessing summary or pre-selected items of Internet information using Internet appliances (20-25) is provided. Users access Internet information through an Internet appliance interface optimized for the network bandwidth and display capabilities (22) of the Internet appliance. The Internet information accessed is the information that is determined to be relevant and important to the user. The information is summarized for, and presented to, the user at one or more pre-determined levels of detail.

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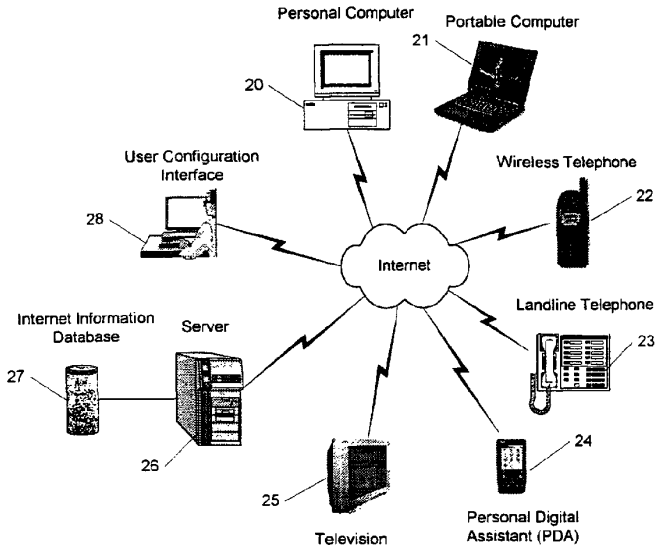
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(54) Title: SYSTEM AND METHODS FOR ACCESSING INTERNET INFORMATION USING INTERNET APPLIANCES



(57) Abstract: A system and methods for accessing summary or pre-selected items of Internet information using Internet appliances (20-25) is provided. Users access Internet information through an Internet appliance interface optimized for the network bandwidth and display capabilities (22) of the Internet appliance. The Internet information accessed is the information that is determined to be relevant and important to the user. The information is summarized for, and presented to, the user at one or more pre-determined levels of detail.

WO 01/27783 A1

SYSTEM AND METHODS FOR ACCESSING INTERNET INFORMATION USING INTERNET APPLIANCES

Field Of The Invention

This invention relates generally to a system and methods for providing access to Internet information from Internet appliances. More specifically, the present invention provides a system and methods for accessing summary or pre-selected items of Internet from Internet appliances according to users' preferences.

Background Of The Invention

The Internet and the World Wide Web (hereinafter "the web") have revolutionized the ways in which information is disseminated and shared. A wide variety of information can be simultaneously accessed by multiple users through a new category of documents designed to easily represent content for display and transmission over the Internet. These new documents, often referred to as *electronic documents* or *web pages*, are increasingly replacing their traditional paper

counterparts as the medium through which business is carried out.

A web page is a multimedia composition that is displayed to the user on a "web browser window" by "web browser software". Under the control of a user, the web browser software establishes a connection over the Internet between the user's computer, and a "web server". This connection is used to download data representing a "web page" from the web server to the user's computer. Web pages may contain text, audio, graphics, imagery, and video content, as well as nearly any other type of content that may be experienced through use of a computer or other electronic devices. Additionally, web pages may be interactive, and may contain user selectable links that cause other web pages to be displayed, forms that may be used to send information from the user to the web server, interactive executable code, or other elements through which the user may interact with web pages. A group of one or more interconnected and closely related web pages, such as all the web pages containing information about a single company, located on one or more web servers, is referred to as a "web site".

At present, information displayed on web pages in the Internet can be accessed by users from various "Internet appliances", which are electronic devices configured with Internet access systems. Internet appliances include, but are not limited to, microprocessor based devices such as personal and portable computers, personal digital assistants, electronic organizers and toys, as well as consumer media delivery devices such as land line and wireless mobile telephones, television, and radio. The Internet access systems allow users to access information such

as their e-mail, news, stock quotes, among others, from different Internet appliances. The information is accessed through an interface, which can be either a *visual interface* or a *voice interface*, depending on the Internet appliance being used to access the information.

A visual interface may be used in Internet appliances that have a visual display, such as personal and portable computers, personal digital assistants (PDA), electronic organizers and toys, as well as consumer media delivery devices such as wireless mobile telephones and television. In appliances that have a small visual display such as PDAs, electronic organizers, and wireless telephones, access to Internet information is provided via *microbrowser* software, which consists of a simpler version of a web browser, with reduced graphic capabilities. Users select an information content provider in the Internet from a pull-down menu displayed in the microbrowser window in the wireless telephone. Such content providers include Yahoo! from Santa Clara, CA, Excite from Redwood City, CA, America Online, Inc., from Dulles, VA, as well electronic commerce companies such as Amazon.com from Seattle, WA. The user makes a specific information request to the content provider, and the requested information is then delivered to the user by the microbrowser in the telephone display.

A voice interface may be used in Internet appliances with speech recognition technologies, such as land line and wireless mobile telephones, to access an *interactive voice response* (IVR) system. These systems enable a telephone user to access information by dialing a phone number corresponding to an IVR system server. The server contains software to issue

voice prompts to the user corresponding to several information access options, and the user responds to the voice prompts by either selecting and pushing buttons on the telephone, or by using speech recognition technologies. Users can access IVR systems from any standard telephone, including those that do not have visual displays.

Examples of IVR systems include those employed by financial institutions to give users access to their accounts over the telephone, such as the system covered in U.S. Patent Number 5,825,856. Similar systems are also employed in a host of other applications, including those in the airline industry offering users the ability to check flight information over the telephone, and the system developed by Tellme Networks, Inc., of Mountain View, CA, that allows users to access information on a variety of topics, such as weather, traffic reports, restaurant reviews, stock quotes, among others.

Both visual and voice interface systems utilize a *request-wait-response* mechanism to access information that may be interesting to a user from an Internet appliance. The user makes requests on a very specific topic, waits for the information to be collected by the system from a server, and receives the information in the visual display of the Internet appliance in case a visual interface is used, or in the form of voice prompts if a voice interface is used. The request-wait-response mechanism works well on high network and display bandwidth Internet appliances such as personal computers, where users can quickly sift through information and make further requests to find exactly the information they are looking for. However, the result is less satisfactory on low network and

display bandwidth Internet appliances, where the speed of information delivery is slower, presentation capabilities are less effective, and control machinery to interact and search for more relevant information is difficult to use.

As an example, consider the case of users wishing to examine their stock portfolio through a wireless telephone. Using existing systems such as the visual-based system designed for wireless telephones provided by Sprint Co. from Westwood, KS, and the voice-based system provided by Tellme Networks, Inc., of Mountain View, CA, the users may either individually request details on each company in the stock portfolio by using the telephone's limited visual or voice interface, or the users may request a list of all the stock information as a single stock portfolio. In both cases, the systems do not provide access to summary or pre-selected items of information quickly and easily. Different pieces of information are often relevant to different users, and users may have to iterate through several items of less important and less interesting information before accessing desired information.

The importance of the information may be dependent on a combination of complex parameters, for example, it may be determined by a combination of how much money users have in the stock in question, what is the percentage change in the stock price, what is the day's range, what is the volume, and when the quarterly results for the company issuing the stock are announced. Users must sift through this information using the limited interface in the telephone, which is a very time consuming and laborious process. Further, the telephone and Internet connections may be unreliable, and the user may have to wait a significant

amount of time to receive the requested information.

In view of the foregoing drawbacks of accessing Internet information from Internet appliances, it would be desirable to provide a system and methods for accessing summary and pre-selected items of Internet information quickly and easily from Internet appliances according to users' preferences.

It further would be desirable to provide a system and methods for creating an Internet information database to store Internet information in categories, manage the relative importance of different items of information, and manage the relationships between different items of information.

It still further would be desirable to provide a system and methods for accessing desired information that is relevant to a particular user's interests at any given moment in time quickly within the Internet information database.

It also would be desirable to provide a system and methods for creating users' profiles to manage the information interests of each user in different information categories.

It further would be desirable to provide a system and methods for delivering summary and pre-selected items of information desired by a user in a concise and easy to comprehend format optimized for the network bandwidth and display capabilities of each individual Internet appliance.

Summary Of The Invention

In view of the foregoing, it is an object of the present invention to provide a system and methods for accessing summary and pre-selected items of Internet information quickly and easily from Internet

appliances according to users' preferences.

It is another object of the present invention to provide a system and methods for creating an Internet information database to store Internet information in categories, manage the relative importance of different items of information, and manage the relationships between different items of information.

It is a further object of the present invention to provide a system and methods for accessing the desired information that is relevant to a particular user's interests at any given moment in time quickly within the Internet information database.

It is also an object of the present invention to provide a system and methods for creating users' profiles to manage the information interests of each user in different information categories.

It is a further object of the present invention to provide a system and methods for delivering summary and pre-selected items of information to a user in a concise and easy to comprehend format optimized for the network bandwidth and display capabilities of each individual Internet appliance.

These and other objects of the present invention are accomplished by providing a system and methods for accessing summary and pre-selected items of Internet information from Internet appliances quickly and easily according to a user's preferences. The user preferences are stored in a user profile that specifies the information interests of the user in a variety of information categories, such as weather, news, stock quotes, among others. The information is stored in an Internet information database designed to enable an

Internet appliance to access desired information for a given user's interests as well as other desired related information. Information determined to be desired by a user is delivered in a format optimized for network bandwidth and display capabilities of that user's Internet appliance. Such a system and methods may automatically provide more detail on information that is deemed relevant to an user, while less important and less interesting information is provided only in a summary format.

In a preferred embodiment, the system of the present invention for providing access to pre-selected items of Internet information from Internet appliances according to users' preferences involve four components: (1) an information server; (2) an information database; (3) a user configuration interface; and (4) an Internet appliance interface.

The information server executes the system software and contains four software modules: (1) an information retrieval module; (2) an information analysis module; (3) an information classification module; and (4) an information rendering module. The server also stores users' profiles that specify the information interests of each user in a variety of information categories, such as weather, news, stock quotes, among others.

The information retrieval module retrieves information from diverse Internet resources such as web servers, news feeds, and e-mail servers. The information analysis module parses the retrieved information to extract different representations at varying levels of detail. The information classification module, classifies the extracted information according to its category and priority.

The information rendering module then extracts the information determined to be desired by a user from the information database, and renders that information at one or more levels of detail and summarization dependent on that user's interest in the information, the priority of the information, and the information rendering capabilities of the user's Internet appliance. The renderings of individual items of information, which may be on a variety of categories and at different levels of detail and summarization, are combined into a summary delivered to the user in a visual format and presentation optimized for the user's Internet appliance. Optionally, the information may be transformed to facilitate presentation using a voice interface.

The information database is designed to enable an Internet appliance to access information according to a given user's interests and as well as other related information. The database records the information in categories and provides mechanisms to determine the relationships between information in different categories. These relationships define sub-categories of information and clusters of information that group related categories and sub-categories together. The clusters of information may be defined by manually programmed relationships between information categories and sub-categories, as well as by relationships formed when natural language processing of the information database can determine what information categories and sub-categories associated with the information accessed by a user are available.

The user specifies which information he or

she considers relevant through a user configuration interface. The interface enables the user to explicitly specify not only the categories of information of interest, but also the relative level of interest in each information category. The information is accessed through an Internet appliance interface in a concise and easy to comprehend format optimized for network bandwidth and display capabilities of each individual Internet appliance.

Advantageously, the present invention enables a user to access Internet information quickly and easily from any Internet appliance.

In addition, the present invention enables a user to select the information accessible through the Internet appliance according to his or her personal preferences.

Brief Description Of The Drawings

The foregoing and other objects of the present invention will be apparent upon consideration of the following detailed description, taken in conjunction with the accompanying drawings, in which like reference characters refer to like parts throughout, and in which:

FIG. 1 is a schematic view of the system and the network environment in which the present invention operates;

FIG. 2 is a flow chart of the methods employed by the information server of the present invention;

FIG. 3 is a schematic view of the transactional queuing mechanisms for retrieving Internet information;

FIG. 4 is a schematic view of an illustrative

information query;

FIG. 5 shows a logic equation to calculate the importance and priority of a weather report;

FIG. 6 is a schematic view of an illustrative fragment of a categorization tree for managing relationships between information items in the information database;

FIG. 7 is a schematic view of an illustrative ad hoc relationship between content nodes in a categorization tree;

FIG. 8 is a schematic view of an illustrative user profile;

FIG. 9 shows an equation to calculate the importance of a content or virtual content node in a categorization tree to an user;

FIG. 10 is a schematic view of an illustrative configured rendering definition for the lottery information category;

FIG. 11 is a flow chart for combining renderings of information categories in accordance with the principles of the present invention;

FIG. 12 is a flow chart for transforming text to facilitate presentation using a voice interface;

FIG. 13 is a schematic view of illustrative written text to voice transformations for improving the understandability of text for voice-based Internet appliance interfaces;

FIG. 14 shows an example text transcript of user access to an illustrative voice-based Internet appliance interface; and

FIGS. 15A and 15B are schematic views of illustrative visual-based interfaces for use with Internet appliances having a visual display.

Detailed Description Of The Invention

The present invention provides a system and methods for accessing concise, relevant, and important items of Internet information quickly and easily from Internet appliances according to an user's preferences. Internet appliances, as used herein, are electronic devices configured with Internet access systems. Internet appliances include, but are not limited to, microprocessor based devices such as personal and portable computers, personal digital assistants, electronic organizers and toys, as well as consumer media delivery devices such as land line and wireless mobile telephones, television, and radio.

Referring to FIG. 1, a schematic view of the system and the network environment in which the present invention operates is described. Internet appliances 20 (personal computer), 21 (portable computer), 22 (mobile telephone), 23 (land-line telephone), 24 (PDA), and 25 (television) communicate across the Internet with information server 26. Internet appliances 20-25 have an Internet appliance interface to access Internet information in a concise and easy to comprehend format optimized for the network bandwidth and display capabilities of each individual appliance.

The Internet appliance interface may be a *visual interface* or a *voice interface*, depending on the Internet appliance being used to access the information. A visual interface may be used in Internet appliances that have a visual display, such as personal computer 20 and portable computer 21, wireless mobile telephone 22, PDA 24, and television 25. A voice interface may be used in Internet appliances with speech recognition technologies, such as wireless mobile telephone 22 and land line telephone 23.

The Internet appliance interfaces access Internet information by connecting to information server 26, which executes the system software and is responsible for retrieving information from diverse Internet resources such as web servers, news feeds, and e-mail servers. Information server 26 parses the retrieved information to extract different representations at varying levels of detail and classify the extracted representations according to their category and priority.

Information server 26 also stores users' profiles that specify the information interests of each user in a variety of information categories, such as weather, news, stock quotes, among others, and extracts the information that is currently most important to the user from information database 27. Information server 26 combines the extracted information into a concise and easy to understand summary to be delivered to the user's Internet appliance.

Information database 27 enables Internet appliances 20-25 to access the most important information for a given user's interests. Information database 27 stores the information retrieved by information server 26 in categories and provides mechanisms to determine the relationships between information in different categories.

Users of Internet appliances 20-25 specify which information they consider to be important and relevant to them through user configuration interface 28. User configuration interface 28 enables users to explicitly specify not only the categories of information in which they are interested, but also their relative level of interest in each information category. User configuration interface 28 may be a

user configuration web site, where a questionnaire about the user's interests can be completed. Information collected in the questionnaire is transmitted to information server 26, which translates the collected information into a user profile. User configuration interface 28 also may be a call center where a user talks to a human operator who asks questions about the user to build up the user profile.

It will be apparent to one of ordinary skill in the art that Internet appliances 20-25 are illustrative, and that alternative Internet appliances may be used with the present invention. It will further be understood that the present invention also could be used in other network settings. For example, rather than connecting through the Internet, the system and methods of the present invention could be used on a local area network. In such a configuration, the Internet appliances and server would all be connected to the same local area network.

I. Overview of Information Flow from the Internet to an Internet Appliance

Referring to FIG. 2, a flow chart of the methods employed by the information server to deliver concise, relevant, and important information from the Internet to an Internet appliance is described. At step 30, the information retrieval module of the information server reliably retrieves information from diverse Internet resources such as web servers, news feeds, and e-mail servers. The information may contain news and weather reports, stock quotes, e-mails, among others. The retrieved information is parsed at step 31 by the information analysis module of the information server to extract different representations of

information at varying levels of detail. For example, a stock quote for a company may be extracted solely by the stock price at a low detail representation, or by the stock price, the low and high of the day's price, the volume traded, and the percent change in value at a higher detail representation.

At step 32, the extracted information is classified by the information classification module of the information server according to the category and priority of the information. The information category may include weather, traffic, financial news, movies, among others. The priority of the extracted information is based on the importance of the information independent of the level of interest any individual user has in that information and on the importance of the information independent of how old the information is. The priority is calculated based on the assumption that the information has just been reported.

At step 33, the information is stored in the information database. The information database is designed to enable an Internet appliance to access the most important information for a given user's interests as well as other important inter-related information. The database records the information in categories and provides mechanisms to determine the relationships between information in different categories. These relationships define sub-categories of information and clusters of information that group related categories and sub-categories together. The clusters of information may be defined by manually programmed relationships between information categories and sub-categories, as well as by relationships formed when natural language processing of the information database

can determine what information categories and sub-categories associated with the information accessed by a user would ideally be available.

Lastly, at step 34, the information rendering module extracts from the information database the information determined to be important to the user. The information extracted from the database is rendered at different levels of detail and summarization dependent on the user's interest in the information, the priority of the information, and the information rendering capabilities of the user's Internet appliance. The user's information preferences are extracted from the user's profile stored in the server. The user's profile specifies the information interests of each user in a variety of information categories, such as weather, news, stock quotes, among others. The renderings of individual items of information, which may be on a variety of categories and at different levels of detail and summarization, are combined into a concise and easy to understand summary delivered to the user at step 35 in a format and presentation optimized for the user's Internet appliance.

II. Information Retrieval

The information retrieval module of the information server reliably retrieves information from diverse Internet resources such as web servers, news feeds, and e-mail servers. To ultimately provide a robust and deterministic user interface for the user, availability of up to date Internet information must be guaranteed by the system. Standard Internet protocols do not guarantee end to end delivery of information since any number of computer or network failures can effect the delivery. Unless the user is protected from

this unreliability, speed and ease of use will be compromised. The information retrieval module uses transactional queuing mechanisms with retry queues to manage requests for Internet information and handle failures. This ensures that required information content is brought into the system with the appropriate or necessary frequency to satisfy user demand.

Referring to FIG. 3, a schematic view of the transactional queuing mechanisms for retrieving Internet information is described. The information to be retrieved from the Internet by the information server is specified in a configuration object called an *information query*.

An information query object specifies the location on the Internet from which the information may be fetched, for example, the URL of a web site, the frequency during which it should be collected, for example, every hour during the day, the category of the information being collected, how to calculate the priority of the information being collected, and how the retrieved information should be parsed by the information analysis module of the information server, that is, what specific information items should be extracted from the information collected.

An information query can specify an individual item of Internet information to be collected, or more often, it can specify a collection of Internet information such as a set of stock prices from a user's portfolio or even all the stock prices on the New York Stock Exchange.

Two queues are used to manage the information requests from the Internet, normal queue 36 and retry queue 37. Normal queue 36 handles the successful information retrievals, while retry queue 37 handles

the failed information retrieval attempts. Information queries are retrieved from the Internet starting at the head of normal queue 36 and finishing at the tail of normal queue 36. The same information query may be placed at different positions in normal queue 36 to retrieve the information at a particular time frequency.

A request for information query 38 at the head of normal queue 36 is sent to the Internet by the information server. There are two possible outcomes of this request. First, the information specified in information query 38 is retrieved from the Internet within a configured allowed time and so processing of the information by the information analysis and information classification modules of the information server and storage of the information in the information database can be completed.

Upon completion, information query 38 is placed at the tail of normal queue 36 as information query 39. Second, either a network failure occurs during retrieval of information query 38 or the information is not retrieved from the Internet within a configured time limit. In this case, information query 38 is placed at the tail of retry queue 37 as information query 40 to be retried at a later date.

Retry queue 37 is processed in a similar way to normal queue 36, with a request for information query 41 at the head of retry queue 37 being sent to the Internet. Information query 41 consists of a failed information request that was previously attempted by the information server in normal queue 36. Similarly to normal queue 36, there are two possible outcomes for requesting information query 41.

First, the information specified in information query 41 is retrieved from the Internet within a configured allowed time and so processing of the information by the information analysis and information classification modules of the information server and storage of the information in the information database can be completed. Upon completion, information query 41 is placed at the tail of normal queue 36 as information query 39. Second, either a network failure occurs during retrieval of information query 41 or the information is not retrieved from the Internet within a configured time limit. In this case, information query 41 is placed at the tail of retry queue 37 as information query 40 to be retried at a later date.

In such a way, normal queue 36 handles collection of information that can be handled "reliably," i.e., where information can be retrieved with a statistically acceptable frequency, and retry queue 37 handles "unreliable" Internet information. The information server uses this basic queuing mechanism to ensure transactional receipt of Internet content and efficient handling of network and Internet server failures. Advantageously, failure to retrieve information from the Internet is dealt with gracefully, that is, without data loss by the scheduling of a retry in retry queue 37.

In addition, careful configuration of time out periods on the processing of information queries allows efficient information retrievals. For example, a relatively short time out period on normal queue 36 means that slow and unreliable connections are aborted quickly, leaving normal queue 36 to continue to rapidly process other information queries. A long time out

period on retry queue 37 means that the information server will wait for slower connections without holding up the receipt of the main bulk of Internet information. Further efficiency gains may be made through parallelism, both in the use of different queue pairs for different types of information content, for example, one queue pair to handle e-mails, another queue pair to handle web sites, and so on, and also by having multiple multi-threaded processors of each queue.

III. Information Analysis

Once information has been received from the Internet, it is parsed by the information analysis module of the information server to extract different representations of information at varying levels of detail. The different representations of information to be extracted are specified in the information query issued by the information retrieval module of the information server.

Referring now to FIG. 4, a schematic view of an illustrative information query is described. Information query 42 consists of an XML function that is executed by the information server to extract stock quote information from the Internet. Information query 42 contains two fields, query field 43 and information field 44. Query field 43 specifies URL 45 from which the stock price information is to be extracted, broad category 46 of the information being collected, time 47 during which the information should be collected, and how the priority of the information should be calculated (48). Upon execution of information query 42, the information server receives the source data contained in URL 45.

Information field 44 specifies how to parse the collected information, that is, what data fields (49) should be extracted from retrieved URL 45 and how. Data extraction utilizes pattern-matching techniques to extract data fields 49, which in the case of information query 42 for a stock price, include: the name of the stock, the market in which the stock is traded, the stock symbol, the last trade date and price, the change and change percent in value of the stock, the previous closing price, the volume traded on the day, among others. The process for extracting data fields 49 involves searching for known terms and markers in URL 45. These terms and markers are used as beginning and end delimiters for the data field being sought. For example, data field 50 for the stock symbol specifies data type 51, beginning delimiter 52, and end delimiter 53.

The pattern matching specification can either be built manually by a system administrator operating a user interface to highlight data fields 49 in URL 45, or automatically by using natural language analysis and heuristic techniques to recognize expected data fields in a source information of a known context. In case the information is easily accessed from a database, the natural language analysis is not required since the data fields can be directly extracted from the database. The natural language analysis is preferred to the manual method since it does not involve human interaction, which would be very slow and inefficient in retrieving Internet information during short time intervals.

IV. Information Classification

The information classification module classifies the extracted information according to its category and priority. Classifying the information according to its category begins with knowledge of where the information collected originated. In some circumstances, this may be all that is required to position the information in the correct information category. For example, if the information came from a news feed that provides only surf reports for a specific beach, then the information can be automatically categorized.

More likely, knowledge of the source information provides only broad categorization, and the final classification can only be determined in combination with data fields extracted during the information analysis. For example, a news feed providing stock quotes specifies a broad classification of any information read from the news feed as a stock quote, but this broad categorization must be combined with the company name and perhaps the market on which the stock is traded to provide the final category classification. This additional information can be determined from the data fields extracted during the information analysis, with the rules for providing the final classification category being specified in the information query. For example, information query 42 is categorized based on a combination of a broad category field and the name of the stock (54).

The information classification module calculates the priority of each item of Internet information collected based on the importance of the information independent of the level of interest any individual user has in that information and on the

importance of the information independent of how old the information is. The priority is calculated based on the assumption that the information has just been reported. An individual user's interest in a category of information and the modification of priority based on how recently the information was reported are properties that are applied by the information classification module at the time at which the information is accessed by the user. The individual user's interest in a category of information is specified in the user's profile stored in the information server.

The priority of an information category is computed using arithmetic and logic equations. For example, illustrative priority equation 48 in FIG. 4 is an arithmetic equation to calculate the importance of a stock quote based on the percentage change of a stock price. Data used within the calculation is taken from the CHANGEPERCENT data field (49) extracted during information analysis.

Referring now to FIG. 5, an illustrative logic equation to compute the importance and priority of a weather report is described. Logic equation 55 determines the importance and priority of a weather report by looking for occurrences of unusual weather conditions within the weather report, such as thunderstorms, ice, sleet, wind conditions, among others. When an unusual weather pattern is present at the weather report, the priority of the weather report is increased.

The priority of an information category is represented by a numeric value such that the higher the value, the higher the priority. The priority can take values between 0 % and 100 %, and it is normalized to

provide consistent values across information categories. An assignment of a priority of 95 % implies that an item of information is more important than 95 % of the information previously collected in a specific information category. In this way, historical trends can be used to normalize the calculation of priority of an item of information within a category.

It should be understood by those skilled in the art that a wide variety of equations may be used to calculate the priority of any given information category. For example, in calculating the priority of e-mail received, header information within the e-mail can be used as the basis of a calculation of the priority of an individual message. Such information can be extracted from the subject of the e-mail by looking for reply or forward markers, or from the e-mail distribution list by looking for e-mail sent directly to the user.

V. Information Database

Once the retrieved information has been analyzed and classified according to its category and priority, it is stored in an information database designed to enable an Internet appliance to access the most important information for a given user's interests as well as other important inter-related information. The information database records the information in categories and provides mechanisms to determine the relationships between information in different categories.

Referring to FIG. 6, a schematic view of an illustrative fragment of a categorization tree for managing the relationships between information items in the information database is described. Categorization

tree 56 organizes the information in the information database by categories and associated relationships between information items in the categories. The categories and associated relationships are manually programmed in the information database.

Each information item in categorization tree 56 is a node in the tree, and a universally unique identifier is assigned to every node in the tree to uniquely identify a node. There are five types of nodes in categorization tree 56: (1) global root node; (2) category node; (3) cluster definition node; (4) content node; and (5) virtual content node. Each node in the tree may be of more than one type. Global root node 57 defines the head of the information space from which all of the information in the database may be traversed. Category nodes 59a and 59b represent a category of information within the information database, with category node 59a representing the entertainment category and category node 59b representing the geography category. Category node 59a is divided into category nodes 61a-c, which are sub-categories of the entertainment category, namely, movies (61a), producers (61b), and actors (61c).

Category node 61a refers to content node 63a and virtual content nodes 63b and 65. Content node 63a contains an instance of information content produced by the information analysis module of the information server, in this case, a video clip of a movie. Content nodes may be of different types, including text, graphics, imagery, video, sound, and combinations. Virtual content nodes 63b and 65 specify instances of information that vary depending on context parameters, for example, virtual content node 63b represent movie theater information that depends on location, and

virtual content node 65 represent movie schedules that depend on date and time. Other virtual content nodes in categorization tree 56 include node 61d representing maps of given locations, and node 61e, representing driving directions between two locations.

In addition, category nodes 61a (movies)and virtual content node 63b (theaters) are also cluster nodes, which define a cluster of information containing related information items. Cluster node 61a define cluster 66 and cluster node 63b define cluster 67. Cluster 66 is used to specify that when information on a movie is requested by a user, related information such as the movies' producers (61b) and actors (61c), a sample preview clip of the movie (63a), and the theaters where the movie is currently playing (63b) can also be displayed to the user. Information clusters allow the users to see all relevant information on a topic and can be cascaded to form large interrelated maps of content. When a new information item belonging to an information category is inserted in the information database, any existing information cluster for that information category is checked to determine whether the new information item can be inserted in the cluster.

The nodes in categorization tree 56 are connected to each other through several arcs that define relationships between the nodes. An arc links two nodes specified by their unique identifiers, and also has properties defining the weighted strength of a relationship, the age and any expiration date of the relationship, and any ownership or privacy rules. The weighted strength of a relationship is a value associated with the arc that determines how strongly the nodes connected by the arc are related. This value

is used by the information rendering module of the information server when extracting the most important information for a user from the information database. Ownership and privacy properties define which users have access to the information stored at the node destination of an arc. For example, e-mail messages are made private to a user by their ownership being associated to the user and properties being set on the arc that enforce the privacy of e-mail messages.

There are five types of arcs in a categorization tree: (1) "is a subcategory of" arc; (2) "is an instance of" arc; (3) "is equivalent to" arc; (4) "is related to"; and (5) "is a cluster definition of" arc. The "is a subcategory" arc is used to link the global root node to category nodes to form a categorization of the information space. Arcs 58a and 58b in categorization tree 56 are of this type.

The "is an instance of" arc is used to connect category nodes to content nodes or virtual content nodes to indicate that the content is in the specified category. Arcs 62a and 62b in categorization tree 56 are of this type.

The "is equivalent to" arc indicates when two or more content nodes contain equivalent content, for example, two content nodes containing news stories on the same topic and same date but from different news sources would be connected with an "is equivalent to" arc.

The "is related to" arc is used to specify relationships between instances of information in content nodes and virtual content nodes, such as arc 64 in categorization tree 56.

Lastly, the "is a cluster definition of" arc is used to connect a category node to a cluster node

and that cluster node to other nodes that may contain information that if available should be presented with the requested information in the cluster node since it is closely related. Arcs 68a-d in cluster 66 of categorization tree 56 and arcs 69a-c in cluster 67 of categorization tree 56 are of this type.

Information items in the information database also can be interrelated by defining "ad hoc relationships" between them. Ad hoc relationships are formed when natural language processing of content nodes in a categorization tree can determine what other associated information are available to an user and also what information a content node can supply that would be of interest to other content nodes. This enables ad hoc relationships to be built between content nodes from anywhere within the information database without having to follow manually programmed cluster or category definitions already in place in the information database.

Referring now to FIG. 7, a schematic view of an illustrative ad hoc relationship between content nodes in a categorization tree is described. Content node 70 contains an instance of a summary plot of the movie *Antz*, and is connected to content nodes 71, 72, 73, and 74, through "is related to" arcs. Natural language processing of the information in the categorization tree has determined that content node 75 representing a TV show containing a review of the movie *Antz* is related to content node 70. An ad hoc relationship is then formed between content nodes 70 and 75 though "is related to" arc 77.

VI. User Configuration Interface & User Profile

A user specifies which information he or she considers to be important and relevant through a user configuration interface. The interface enables users to explicitly specify not only the categories of information of interest, but also the relative level of interest in each information category. The user configuration interface may be a user configuration web site or a call center where a user talks to a human operator. In both cases, a questionnaire about the user's interests is completed and transmitted to the information server, which translates the collected information into a user profile.

Referring to FIG. 8, a schematic view of an illustrative user profile is described. User profile 78 consists of an XML function that is executed by the information server when the user requests information from an Internet appliance. The user profile is used to extract only the information determined to be important and relevant to that user from the information database.

User profile 78 specifies user's interests in categories 79a-f, namely, e-mail (79a), financial (79b), lottery (79c), traffic (79d), weather (79e), and horoscope (79f). Category 79b has two sub-categories, 80a and 80b, further specifying the user's interest in stock prices of technology companies as the relevant financial information. Categories 79a-f have information or content items 81a-h that specify exactly what information item belonging to a given category the user has an interest in. For example, in traffic category 79d, the user only has an interest in the traffic of the San Francisco Peninsula in California, USA (81f).

Information items 81a-h have associated interest levels 82a-h that specify the importance and priority of information items 81a-h to the user. Interest levels 82a-h can be adjusted dynamically based on the user's behavior while interacting with an Internet appliance interface. For example, if information is presented to a user on a particular category of information and the user routinely skips past that information in the Internet appliance interface, the system may determine that the user has a reduced interest in this category of information. As such, the interest level on that particular category recorded in the user profile may be reduced accordingly with appropriate notification to the user.

Conversely, if a user spends a significant amount of time accessing a particular category of information in the Internet appliance interface, it can be reasonably determined that the user has a higher interest level in that information category. As such, the interest level on that particular category recorded in the user's profile can be increased accordingly with appropriate notification to the user. The dynamic adjustments to a user's interest levels are limited within reasonable bounds to avoid such adjustments having a more significant effect on the user profile than more accurate specifications of a user's interests specified in questionnaires through user configuration interfaces.

VII. Information Rendering

The user's profile is combined with the information in the information database to provide the most important information to the user through an Internet appliance interface. The information rendering module of the information server traverses an

individual user's profile, taking each definition of a category of interest as a starting point within the information database, which corresponds to a category node in a categorization tree. From each of these starting points within the information database, a calculation is carried out to determine which pieces of information in the vicinity of the starting point are important enough to bring to the user's attention, that is, which content nodes and virtual content nodes can be reached from the starting point by traversing arcs in the categorization tree in the information database. The importance of a content node and virtual content node to the user and how strongly the nodes are related depend on the combined weighted strength of the arcs that are traversed.

Referring to FIG. 9, an illustrative equation to compute the importance of a content or virtual content node in a categorization tree to an user is described. Equation 83 involves three parameters, 83a-c, that are used to calculate the importance of a content or virtual content node. Equation parameter 83a consists of the multiple of all strength of relationship weights assigned to the arcs that are traversed from the starting point to get to the content or virtual node whose importance is being determined. The weights are recorded in the information database. Equation parameter 83b is extracted from the user's profile and consists of the interest level of the user in the information category represented by the category node at the starting point. Lastly, equation parameter 83c is an aging factor stored in the information database for each arc traversed from the starting point to the content or virtual node whose importance is being determined. The aging factor for a given arc is

determined as the difference in dates between the date when the arc was created and the date when the user is accessing the information at the starting point.

Equation 83 is calculated for each of the user's interests so that a prioritized list of the importance of the information in the information database to be transmitted to the user is constructed. The prioritized list is used to determine the order in which the information is to be transmitted to the user when accessing an Internet appliance interface. The process of constructing the prioritized list can be optimized by using importance thresholds for arcs that are traversed from a starting point to a content or virtual content node. Arcs whose importance fall below the importance threshold will link to information items that will not be important enough to bring to the attention of the user, so that equation 83 is only calculated for the subset of arcs which is most interesting to the user.

By adjusting the importance threshold, the quantity of information pulled from the information database can be adjusted for different Internet appliance bandwidths, different Internet appliance interfaces, and different user requests. Additionally, when this process is applied to only a subset of the user's profile, a similar prioritized list can be constructed for a subset of information categories in the user's profile. These subsets allow the user to have more control of the level of detail presented for each information category when accessing an Internet appliance interface. For example, when a user initially logs into an Internet appliance interface a high level summary can be obtained of all their information interests at a relatively high importance

threshold. The user then may go on to view more information, including that at a lower importance threshold in a specific information category, such as viewing the details on a stock portfolio when accessing the financial category.

The calculation of the importance of each individual item of information to a user allows a decision to be automatically made as to whether that information item should be presented to the user when accessing a particular Internet appliance. It also enables the information rendering module of the information server to decide how much detail should be provided when the information is presented (or "rendered") to the user such that an information item that is more important to the user at a moment in time is rendered with more detail than another information item that is less important. This approach helps the information rendering module of the information server present information concisely to the user.

The rendering of information is based on configured rendering definitions that are stored in the information server and specify what information is available at different levels of detail, or strata. A rendering of information at a higher strata is more summarized than a rendering of the same information at a lower strata.

Referring to FIG. 10, a schematic view of an illustrative configured rendering definition for the lottery information category is described. Rendering definition 84 consists of an XML function that is executed by the information server when information is to be rendered from the information database to an Internet appliance. Rendering definition 84 contains two rendering levels of detail, 85 and 86. Each

rendering level of detail defines an information category (85a and 86a), a stratum (85b and 86b), the Internet appliance interface for which the information is being rendered (85c and 86c), and the language in which it is being rendered (85d and 86d).

Each rendering level provides formatting within which data parameters such as data parameter 87 are substituted. Data parameters substituted in renderings are extracted by the information analysis module of the information server and stored in the information database. Rendering definitions may be conditional on the values of data parameters such that detail for a particular information category is only rendered if the values of certain data parameters indicate that the user may be interested in receiving the detailed information. For example, detail on the volume of a stock may be rendered to an user if a stock volume parameter indicates that the volume in the traded stock has reached an exceptional value at a particular date.

Stratum 85b at 100 % represents a minimum rendering consisting of only a summary of the latest information on information category 85a. Stratum 86b at 50 % provides some additional detail for the user, in this case, the latest two lottery results, that may be rendered if the user's interest level in information category 86a is high enough. Any number of renderings may be configured between the 100 % stratum and 0% stratum levels. A rendering for an item of information is selected by the information rendering module of the information server when the stratum value is appropriate for the level of importance of the information to the user. The higher the importance of an item of information, the lower the stratum and the

lower the summarization selected to render the information, that is, the information will be rendered with more detail.

The selection of a rendering definition depends on the Internet appliance interface (85c and 86d) for which information is being rendered. Only renderings appropriate for a user's Internet appliance are selected for rendering an item of information. The same information item may be rendered in different ways for different Internet appliances so as to optimize the effectiveness of the information on the target appliance. For example, a stock quote may be rendered in the form of a visual graph on an Internet appliance with a visual display, but on a voice-based Internet appliance the rendering may consist of only the percentage change in the stock price.

Referring to FIG. 11, a flow chart for combining renderings on a variety of information categories into a concise and easy to understand summary to be delivered to an Internet appliance is described. To make the combined rendering both easy to understand by the user and also most effective in quickly providing the most important information to an user, a two-stage sorting algorithm is carried out. First, at step 89, the list of renderings of all information categories that are important to the user are sorted so that the most important information categories are rendered to the user before the less important ones. Second, at step 90, a sort is performed within each information category to order the individual information items in each information category by their importance to a user. For example, ordering individual information items in the stock quotes category would render a stock price that has

risen substantially prior to one that is stable.

Providing a concise and easy to understand summary optimized for network bandwidth and display capabilities of each individual Internet appliance optionally involves a method for transforming text so that it can be presented using a voice-based interface.

Referring now to FIG. 12, a flow chart for transforming written text so that it may be presented by a voice interface as it is normally spoken in conversation is described. At step 93, an information context analysis is performed so that the broad context of the information is determined by the information rendering module. The broad context may determine, for example, that the information item is an e-mail message, or that the information item contains telephone numbers of a movie theater.

The context analysis searches for known keywords within the information rendering that indicate the context of the information, for example, a paragraph of information that contains the words "highway" and "interstate" is likely to be discussing roads, a sentence that starts with the word "phone" is likely to contain a phone number, a sentence that contains the word "dollar" or the character "$" is likely to contain financial figures, and so on. At step 94, a word token analysis is performed by the information rendering module to determine word tokens whose understandability when spoken in conversation can typically be improved. Examples of such word tokens include streams of numbers or dates, or header information in an e-mail message.

By combining steps 93 and 94, a high degree of reliability can be achieved in improving the understandability of text. Referring now to FIG. 13, a

schematic view of illustrative written text to voice transformations for voice-based Internet appliance interfaces is described. Information context analysis 96, token analysis 97, and improved renderings 98 contain examples of transformations of different information items in particular contexts, including information items in financial context 99 and information items in telephone context 100.

Information items in financial context 99 are rendered in such a way to clarify specific symbols used in a financial context, such as "$" signs and "½" fractions of stock quotes, which are rendered in speech as the word "dollar" and the word "half", respectively. Similarly, telephone numbers in telephone context 100 are rendered so that well-known phone prefixes, such as "1-800" and area codes, are easily understood in a voice-based interface.

VIII. Internet Appliance Interface

The rendered information can be accessed from an Internet appliance through an Internet appliance interface, that may be a voice interface or a visual interface, depending on the display capabilities of the Internet appliance being used. The Internet appliance interface is designed to that information can be accessed from any Internet appliance with little user interface interaction. The Internet appliance interface preferably provides the a high degree of desired Internet information to an user in a conveniently accessible manner from any Internet appliance.

Referring to FIG. 14, an example text transcript of user access to an illustrative voice-based Internet appliance interface is described. Text

transcript 101 contains the text translation of voice prompts issued by the user of a voice-based Internet appliance interface as well as the text translation of the voice information sent by the information server to the user during a user's phone call to the server. Upon dialing the phone number corresponding to the server, the user receives summary 102 of the information important to the user. After a brief pause following summary 102, the information server presents the user menu of options 103 to prompt the user for access to the user's pre-selected information categories.

When the user selects an information category option by saying the number corresponding to the selected information category, the server fetches the appropriate rendering configuration of the information, and translates the information to the user through information voice notification 104. The information transmitted to the user for each information item depends on the importance of the information item, with more detail information being provided for the information items that are considered more important.

A brief pause follows information voice notification 104, and the user then hears menu 103 again to select further information categories. The user selects the e-mail information category, and listens to e-mail notification 105 from the server. Selecting the e-mail information category again after listening to e-mail notification 105 triggers the server to render the important messages in e-mail notification 106 providing more detail to the user. At any point during the phone call the user may choose to hangup, or to return to menu of options 103 to access more detailed information on the relevant information

categories.

Referring to FIGS. 15A and 15B, schematic views of illustrative visual-based interfaces for use with an Internet appliance having a visual display is described. Visual-based interface 107 shown in FIG. 15A contains top-level summaries on various information categories of interest to an user named Dave, including e-mail messages, financial news, weather information, shopping requests, news headlines, and entertainment news. Each information category is easily accessed through icons displayed in visual-based interface 107. Accessing the information category icons enables the user to get more detail information on any one of the relevant information categories. Visual-based interface 108 shown in FIG. 15B consists of an instance of user interaction requesting information on the movie *Antz*. Visual-based interface 108 displays all the related information on the movie *Antz* that is available on the information database.

Although particular embodiments of the present invention have been described above in detail, it will be understood that this description is merely for purposes of illustration. Specific features of the invention are shown in some drawings and not in others, and this is for convenience only and any feature may be combined with another in accordance with the invention. Steps of the described processes may be reordered or combined, and other steps may be included. Further variations will be apparent to one skilled in the art in light of this disclosure and are intended to fall within the scope of the appended claims.

What Is Claimed Is:

1. A system for providing a user with access to items of Internet information according to a user's preferences using an Internet appliance, the system comprising:

an information server programmed to communicate with an Internet appliance;

an information database programmed to store and manage Internet information;

an user configuration interface to enable an user to generate a user profile to specify the user's preferences; and

an Internet appliance interface to enable an user to access Internet information using the Internet appliance.

2. The system of claim 1, wherein the Internet appliance comprises an electronic device configured to access the Internet.

3. The system of claim 1, wherein the information server comprises:

an information retrieval software module;

an information analysis software module;

an information classification software module; and

an information rendering software module.

4. The system of claim 2, wherein the information retrieval software module comprises information retrieval software routines for retrieving Internet information from a plurality of Internet resources.

5. The system of claim 4, wherein the Internet resources comprise web servers, news feeds, and e-mail servers.

6. The system of claim 4, wherein the information retrieval software routines further comprise transactional queues that manage requests for Internet information.

7. The system of claim 3, wherein the information analysis module comprises:

software routines for parsing retrieved Internet information and extracting information representations at various levels of detail; and

pattern matching software routines for searching and extracting known markers and data fields from retrieved Internet information.

8. The system of claim 7, wherein software routines for parsing retrieved Internet information and extracting information representations comprise information queries for specifying one or more of: information representations to be extracted from the retrieved Internet information; a location from which Internet information is to be extracted; a category of the information being extracted; a time during which the information is extracted; and how to determine the priority of the information being extracted.

9. The system of claim 3, wherein the information classification module comprises software routines for classifying retrieved Internet information according to information categories and information priority.

10. The system of claim 9, wherein the information categories comprise one or more of: a messages categories; a news category; a financial category; a weather category; an entertainment category; a traffic category; and a calendar category.

11. The system of claim 9, wherein the information priority is computed based on the importance of the information independent of a level of user interest and independent of an age of the information.

12. The system of claim 3, wherein the information rendering module comprises:

software routines for extracting the information from the information database determined to be desired by the user;

software routines for rendering items of information at one or more levels of detail; and

software routines for combining renderings of items of information into a summary format.

13. The system of claim 12, wherein software routines for extracting the information comprise software routines for computing the importance of an item of information in the information database based on related information items in the information database and on a level of user interest.

14. The system of claim 13, wherein the level of user interest comprises a priority value associated with the item of information item or information category stored in the user's profile.

15. The system of claim 13, wherein software routines for rendering individual information items at one or more levels of detail comprise software routines for extracting the items of information from the information database specified in a plurality of rendering definitions stored in the information server.

16. The system of claim 15, wherein the rendering definitions comprise formatting specifications for representing the items of information at a plurality of levels of detail.

17. The system of claim 12, wherein software routines for combining renderings of items of information items into a summary format comprise:

a routine for sorting the renderings of the items of information and information categories that are determined to be important to the user; and

a routine for transforming the items of information into a format for presentation by a voice interface.

18. The system of claim 17, wherein the items of information and information categories that are determined to be important to the user are specified in the user's profile with a high priority value.

19. The system of claim 17, wherein routines for transforming the items of information comprises information context analysis software routines and word token analysis software routines.

20. The system of claim 1, wherein the information database comprises software routines for recording items of information in categories and determining relationships between items of information in different categories.

21. The system of claim 20, wherein the software routines organize the items of information in a categorization tree.

22. The system of claim 21, wherein the categorization tree comprises nodes that identify an information item or category and arcs that define relationships between the nodes.

23. The system of claim 22, wherein the nodes comprise a universally unique identifier.

24. The system of claim 1, wherein the user configuration interface comprises a user configuration web site or a human-operated call center.

25. An information server programmed to communicate with an Internet appliance, the information server comprising:

an information retrieval software module;

an information analysis software module;

an information classification software module; and

an information rendering software module.

26. The server of claim 25, wherein the information retrieval software module comprises information retrieval software routines for retrieving

Internet information from a plurality of Internet resources.

27. The server of claim 25, wherein the information analysis software module comprises:

software routines for parsing retrieved Internet information and extracting information representations at a pre-determined level of detail; and

pattern matching software routines for searching and extracting known markers and data fields from retrieved Internet information.

28. The server of claim 25, wherein the information classification module comprises software routines for classifying retrieved Internet information according to information categories and information priority.

29. The server of claim 25, wherein the information rendering module comprises:

software routines for extracting information from an information database determined to be important to a user;

software routines for rendering items of information at one or more levels of detail; and

software routines for combining renderings of the items of information into a summary format.

30. The server of claim 29, wherein the information database comprises a database of Internet information and software routines for recording the information in categories and determining relationships between items of information in different categories.

31. A method for providing Internet information using an Internet appliance according to a user's preferences, the method comprising:

providing a user configuration interface to enable a user to specify his or her information preferences;

retrieving information from the Internet and organizing the information into an information database;

extracting information from the information database determined to be desired by the user;

summarizing the extracted information at a level of detail according to a network bandwidth and display capability of the Internet appliance; and

providing an Internet appliance interface for accessing the extracted information.

32. The method of claim 31, wherein providing a user configuration interface comprises providing a web site or a human-operated call center for the user to specify information preferences.

33. The method of claim 31, wherein retrieving information from the Internet and organizing the information into an information database comprises:

retrieving Internet information from a plurality of Internet resources;

parsing the retrieved Internet information and extracting information representations at various levels of detail;

classifying the information representations into information categories;

assigning a priority level to the information

categories; and

recording the information in the information in the information database according to categories and relationships between information items in different categories.

34. The method of claim 31, wherein extracting information from the information database comprises computing a level of importance of an item of information based on related items of information database and on a user's level of interest in the item of information or information category comprising the item of information.

35. The method of claim 31, wherein summarizing the extracted information comprises providing formatting specifications for representing items of information at a plurality of levels of detail and sorting the items of information.

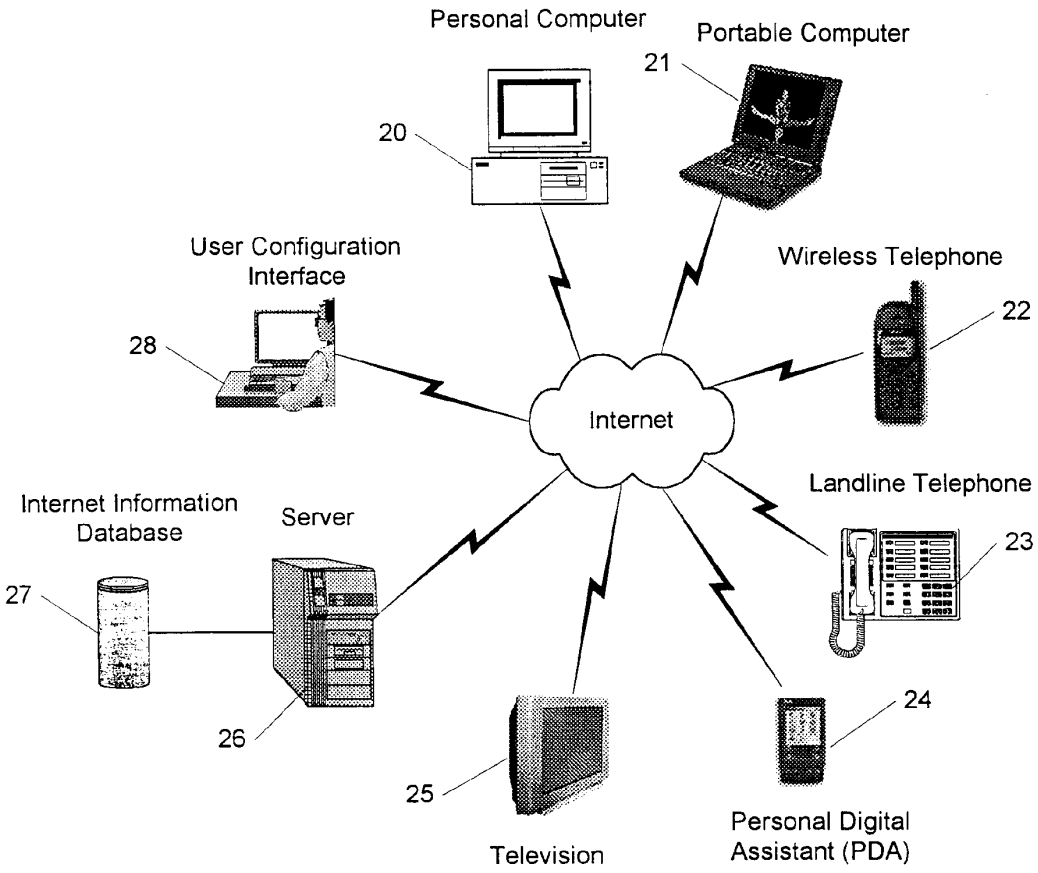

Personal Computer
Portable Computer
21
20
User Configuration Interface
Wireless Telephone
22
28
Internet
Landline Telephone
23
Internet Information Database
Server
27
24
26
25
Personal Digital Assistant (PDA)
Television

FIG. 1

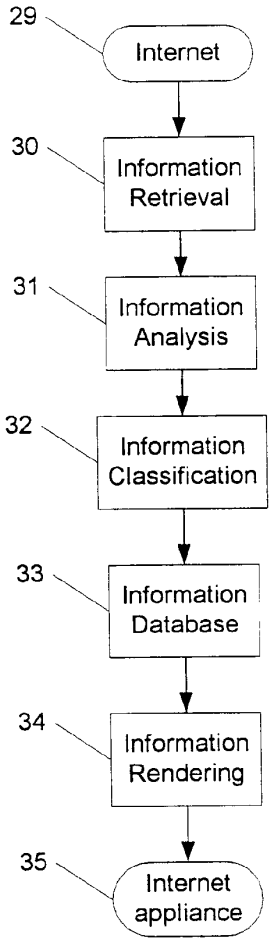

29
Internet
30
Information Retrieval
31
Information Analysis
32
Information Classification
33
Information Database
34
Information Rendering
35
Internet appliance

FIG. 2

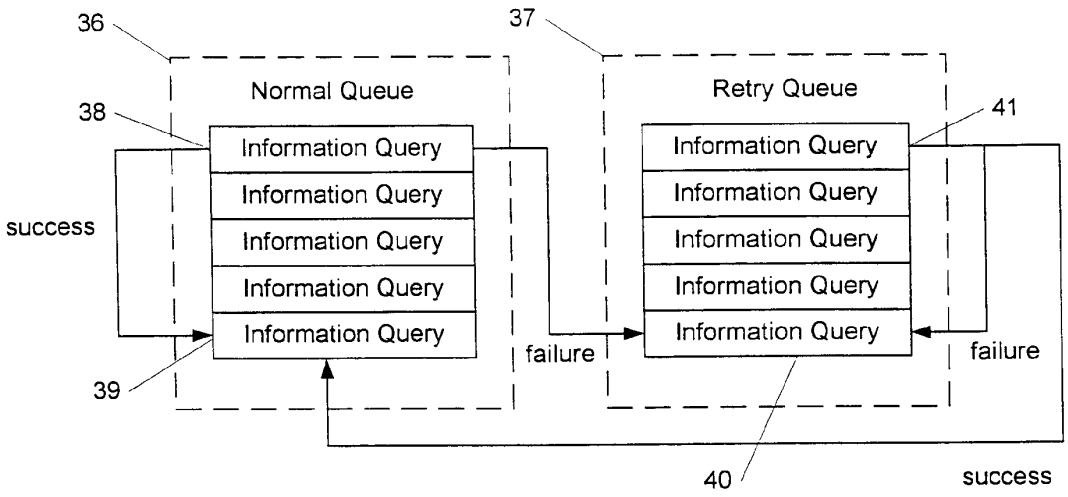

36
37
Normal Queue
Retry Queue
38
41
Information Query
Information Query
Information Query
Information Query
Information Query
Information Query
Information Query
Information Query
Information Query
Information Query
success
failure
failure
39
40
success

FIG. 3

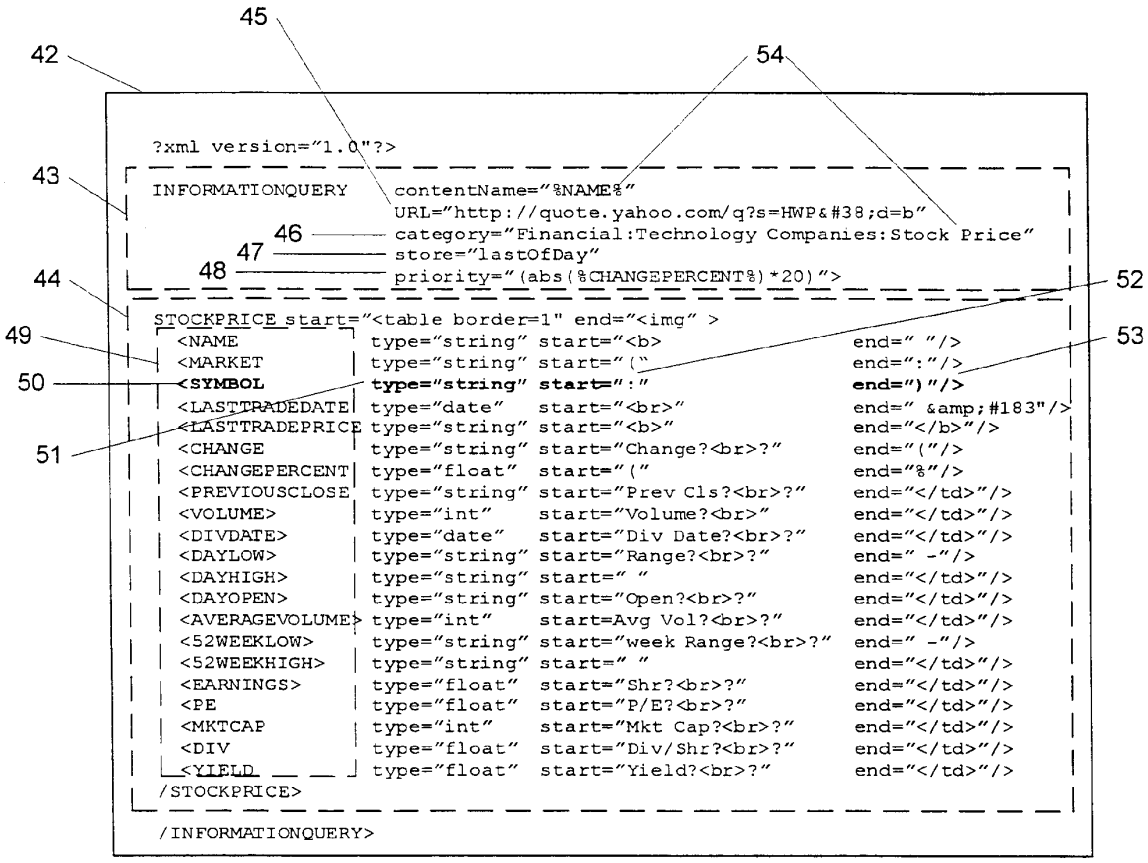

42
45
54
43
46
47
48
44
52
49
53
50
51
?xml version="1.0"?>
INFORMATIONQUERY contentName="%NAME%"
URL="http://quote.yahoo.com/q?s=HWP&d=b"
category="Financial:Technology Companies:Stock Price"
store="lastOfDay"
priority="(abs(%CHANGEPERCENT%)*20)">
STOCKPRICE start="<table border=1" end="<img" >
<NAME type="string" start="" end=" "/>
<MARKET type="string" start="(" end=":"/>
<SYMBOL type="string" start=":" end=")"/>
<LASTTRADEDATE type="date" start="
" end=" &#183"/>
<LASTTRADEPRICE type="string" start="" end=""/>
<CHANGE type="string" start="Change?
?" end="("/>
<CHANGEPERCENT type="float" start="(" end="%"/>
<PREVIOUSCLOSE type="string" start="Prev Cls?
?" end="</td>"/>
<VOLUME type="int" start="Volume?
" end="</td>"/>
<DIVDATE type="date" start="Div Date?
?" end="</td>"/>
<DAYLOW type="string" start="Range?
?" end=" -"/>
<DAYHIGH type="string" start=" " end="</td>"/>
<DAYOPEN type="string" start="Open?
?" end="</td>"/>
<AVERAGEVOLUME type="int" start=Avg Vol?
?" end="</td>"/>
<52WEEKLOW type="string" start="week Range?
?" end=" -"/>
<52WEEKHIGH type="string" start=" " end="</td>"/>
<EARNINGS type="float" start="Shr?
?" end="</td>"/>
<PE type="float" start="P/E?
?" end="</td>"/>
<MKTCAP type="int" start="Mkt Cap?
?" end="</td>"/>
<DIV type="float" start="Div/Shr?
?" end="</td>"/>
<YIELD type="float" start="Yield?
?" end="</td>"/>
/STOCKPRICE>
/INFORMATIONQUERY>

FIG. 4

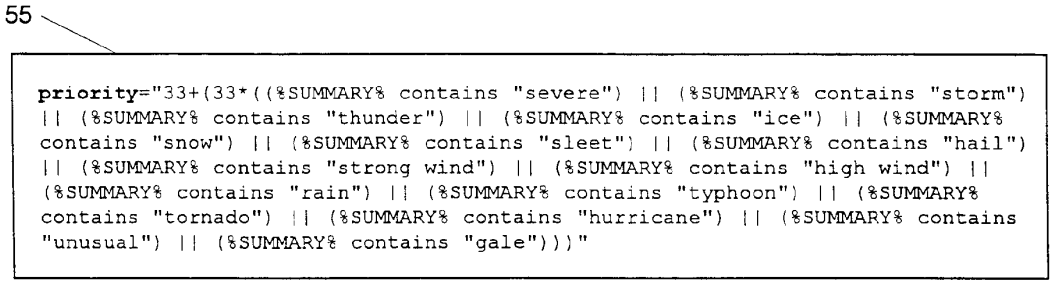

55
priority="33+(33*((%SUMMARY% contains "severe") || (%SUMMARY% contains "storm") || (%SUMMARY% contains "thunder") || (%SUMMARY% contains "ice") || (%SUMMARY% contains "snow") || (%SUMMARY% contains "sleet") || (%SUMMARY% contains "hail") || (%SUMMARY% contains "strong wind") || (%SUMMARY% contains "high wind") || (%SUMMARY% contains "rain") || (%SUMMARY% contains "typhoon") || (%SUMMARY% contains "tornado") || (%SUMMARY% contains "hurricane") || (%SUMMARY% contains "unusual") || (%SUMMARY% contains "gale")))"

FIG. 5

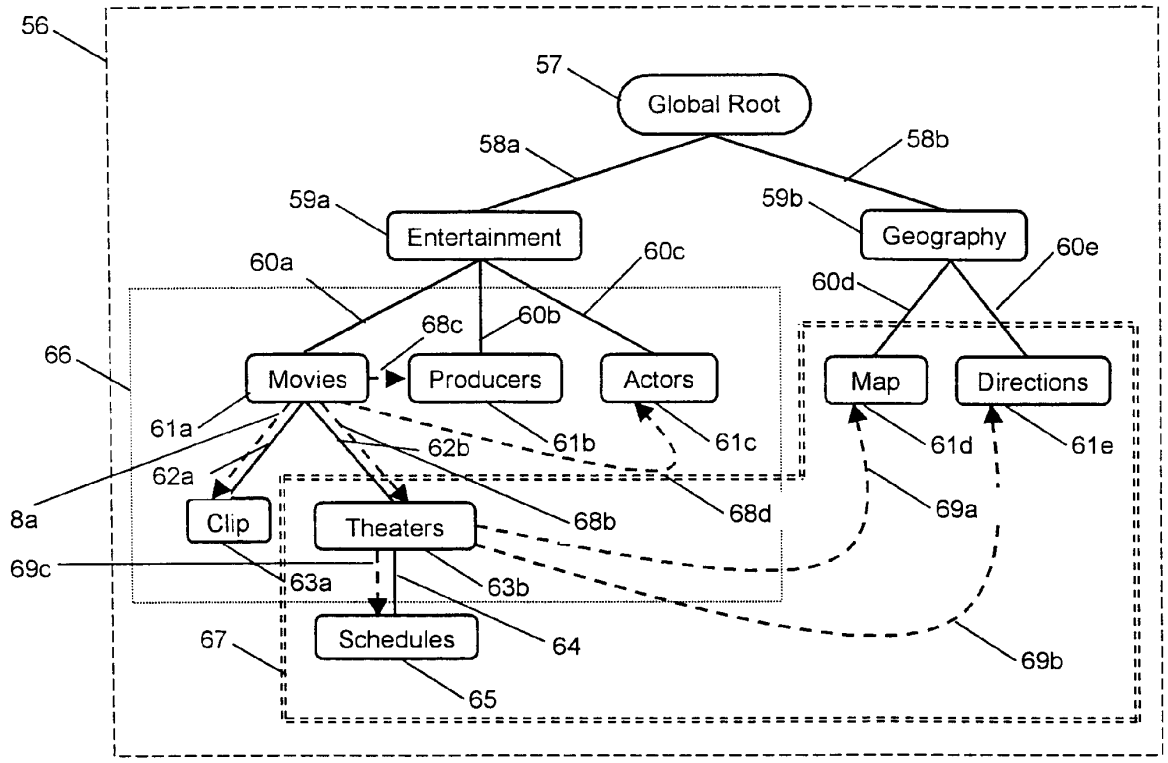

56
57
Global Root
58a
58b
59a
Entertainment
59b
Geography
60a
60c
60e
60d
68c
60b
66
Movies
Producers
Actors
Map
Directions
61a
61b
61c
61d
61e
62b
62a
8a
Clip
Theaters
68b
68d
69a
69c
63a
63b
64
67
Schedules
69b
65

FIG. 6

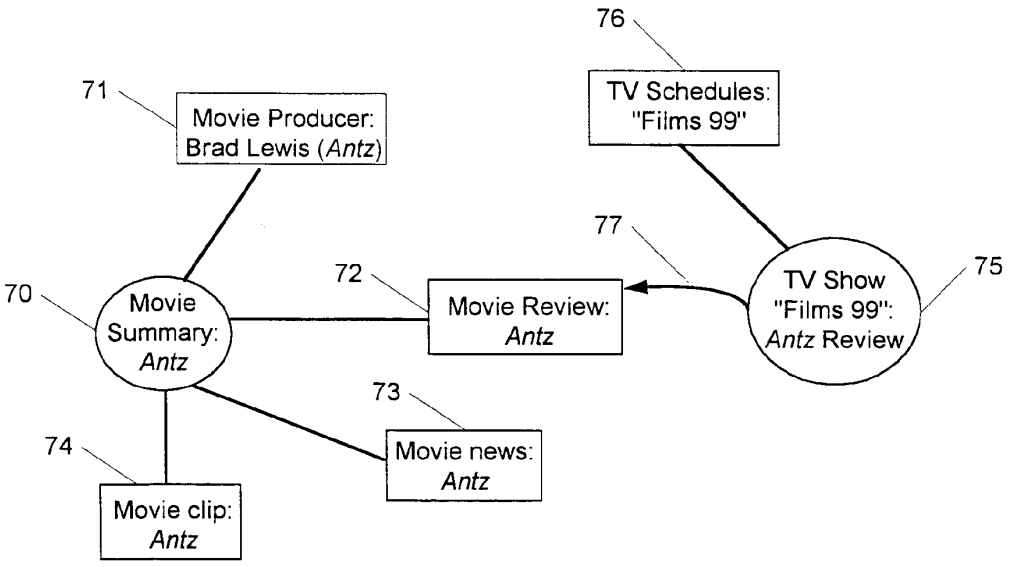

76
TV Schedules: "Films 99"
71
Movie Producer: Brad Lewis (*Antz*)
77
72
75
70
Movie Summary: *Antz*
Movie Review: *Antz*
TV Show "Films 99": *Antz* Review
73
74
Movie news: *Antz*
Movie clip: *Antz*

FIG. 7

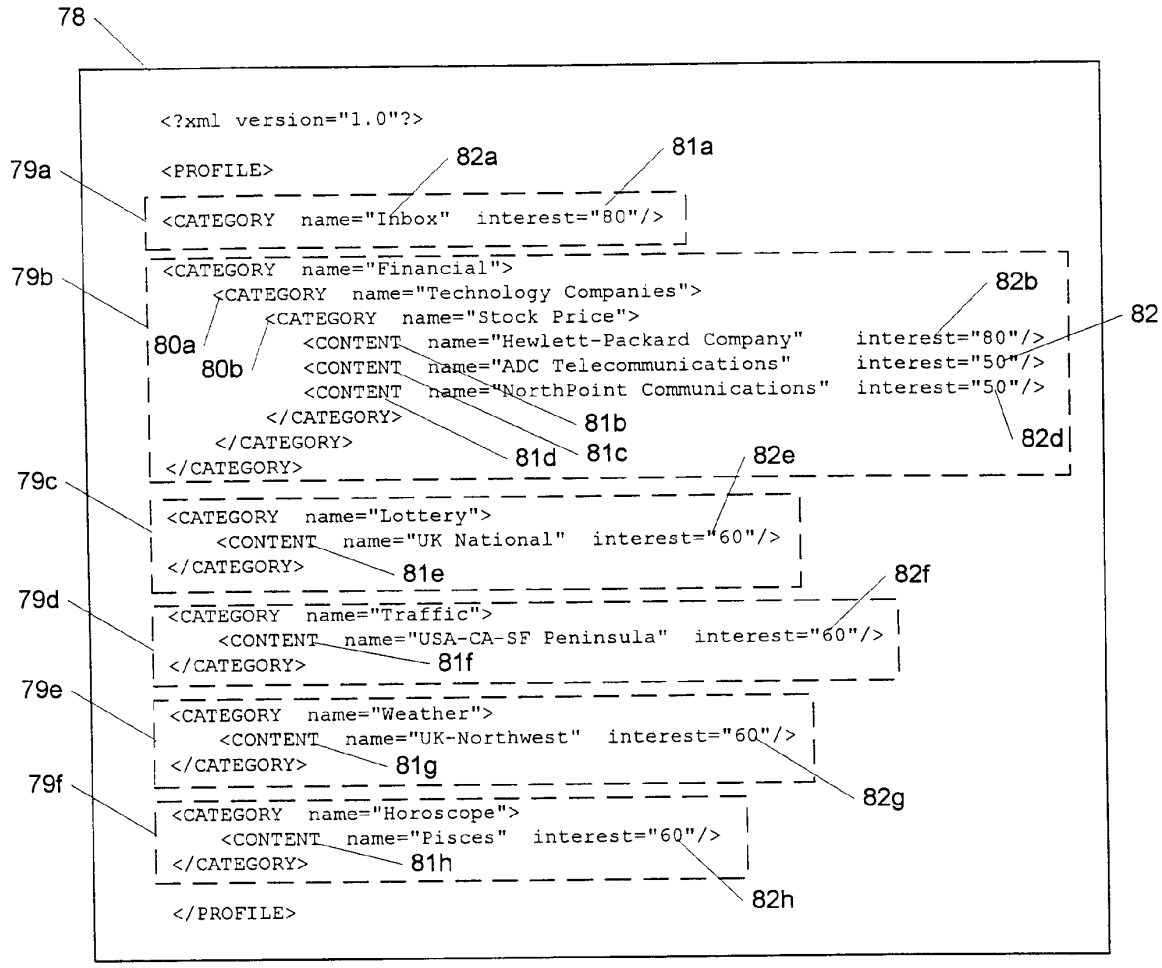

78
<?xml version="1.0"?>
<PROFILE>
<CATEGORY name="Inbox" interest="80"/>
<CATEGORY name="Financial">
<CATEGORY name="Technology Companies">
<CATEGORY name="Stock Price">
<CONTENT name="Hewlett-Packard Company" interest="80"/>
<CONTENT name="ADC Telecommunications" interest="50"/>
<CONTENT name="NorthPoint Communications" interest="50"/>
</CATEGORY>
</CATEGORY>
</CATEGORY>
<CATEGORY name="Lottery">
<CONTENT name="UK National" interest="60"/>
</CATEGORY>
<CATEGORY name="Traffic">
<CONTENT name="USA-CA-SF Peninsula" interest="60"/>
</CATEGORY>
<CATEGORY name="Weather">
<CONTENT name="UK-Northwest" interest="60"/>
</CATEGORY>
<CATEGORY name="Horoscope">
<CONTENT name="Pisces" interest="60"/>
</CATEGORY>
</PROFILE>
79a
79b
79c
79d
79e
79f
80a
80b
81a
81b
81c
81d
81e
81f
81g
81h
82
82a
82b
82d
82e
82f
82g
82h

FIG. 8

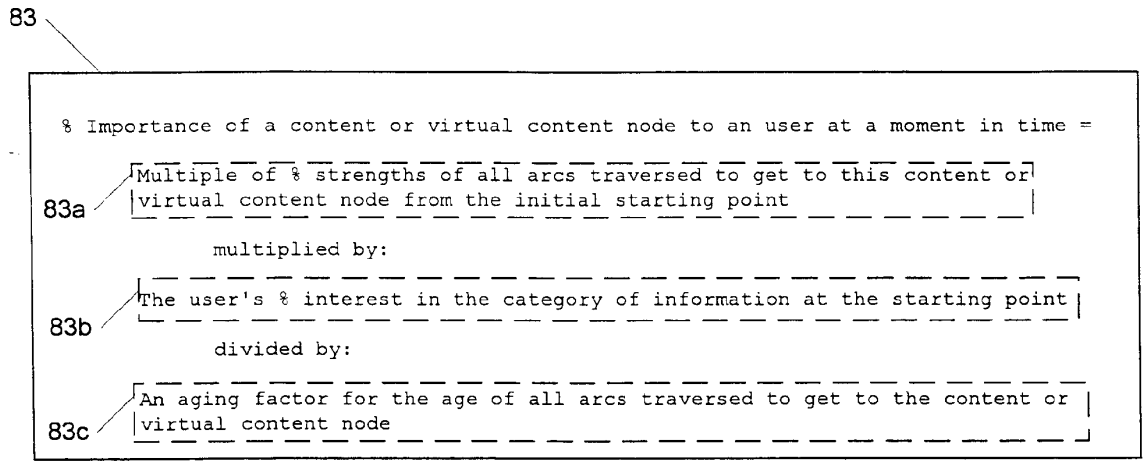

83
% Importance of a content or virtual content node to an user at a moment in time =
Multiple of % strengths of all arcs traversed to get to this content or virtual content node from the initial starting point
83a
multiplied by:
The user's % interest in the category of information at the starting point
83b
divided by:
An aging factor for the age of all arcs traversed to get to the content or virtual content node
83c

FIG. 9

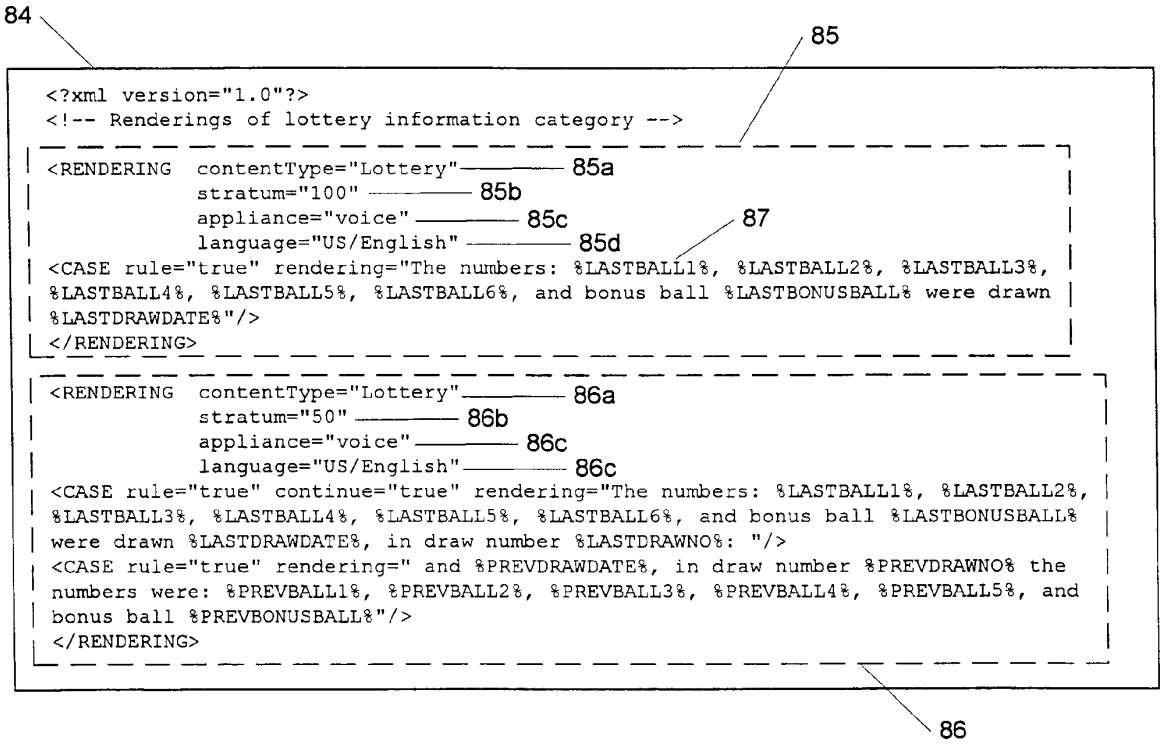

84
85
<?xml version="1.0"?>
<!-- Renderings of lottery information category -->
<RENDERING contentType="Lottery" 85a
stratum="100" 85b
appliance="voice" 85c
language="US/English" 85d
87
<CASE rule="true" rendering="The numbers: %LASTBALL1%, %LASTBALL2%, %LASTBALL3%, %LASTBALL4%, %LASTBALL5%, %LASTBALL6%, and bonus ball %LASTBONUSBALL% were drawn %LASTDRAWDATE%"/>
</RENDERING>
<RENDERING contentType="Lottery" 86a
stratum="50" 86b
appliance="voice" 86c
language="US/English" 86c
<CASE rule="true" continue="true" rendering="The numbers: %LASTBALL1%, %LASTBALL2%, %LASTBALL3%, %LASTBALL4%, %LASTBALL5%, %LASTBALL6%, and bonus ball %LASTBONUSBALL% were drawn %LASTDRAWDATE%, in draw number %LASTDRAWNO%: "/>
<CASE rule="true" rendering=" and %PREVDRAWDATE%, in draw number %PREVDRAWNO% the numbers were: %PREVBALL1%, %PREVBALL2%, %PREVBALL3%, %PREVBALL4%, %PREVBALL5%, and bonus ball %PREVBONUSBALL%"/>
</RENDERING>
86

FIG. 10

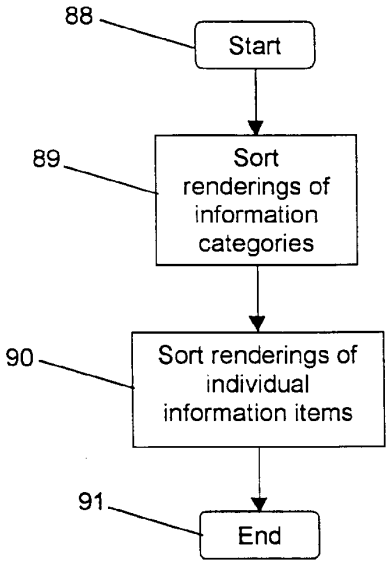

88
Start
89
Sort renderings of information categories
90
Sort renderings of individual information items
91
End

FIG. 11

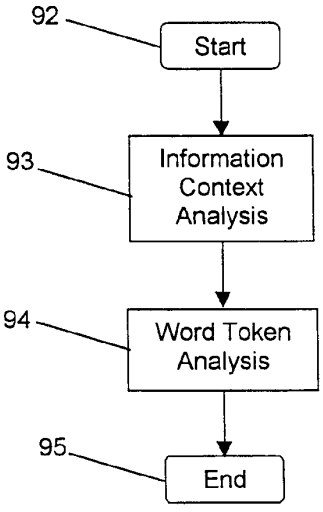

92
Start
93
Information Context Analysis
94
Word Token Analysis
95
End

FIG. 12

96 97 98

99

100

Context Analysis	Token Analysis	Improved Rendering
Financial Context	$1M	1 million dollars
Financial Context	$12 ½	12 and a half dollars
Date Context	2-3 February	2nd to 3rd of February
Date Context	10/13/2000	'yesterday' or 'next Saturday' or 'last Wednesday' as appropriate
Telephone Context	1-800-832-5843	1 eight hundred 8-3-2 5-8-4-3
Telephone Context	408-543-6500	4-o-8 5-4-3 6-5 hundred
Highway Context	I880	Interstate 8-eighty
Highway Context	101	1-o-1
e-mail Context	Attached message header	'An attached message sent by Joe Smith yesterday'
e-mail Context	☺	Smiley face
e-mail Context	nicks@sirenic.com	e-mail address: nicks at sirenic dot com
Any Context	http://www.sirenic.com	web address: www dot sirenic dot com

FIG. 13

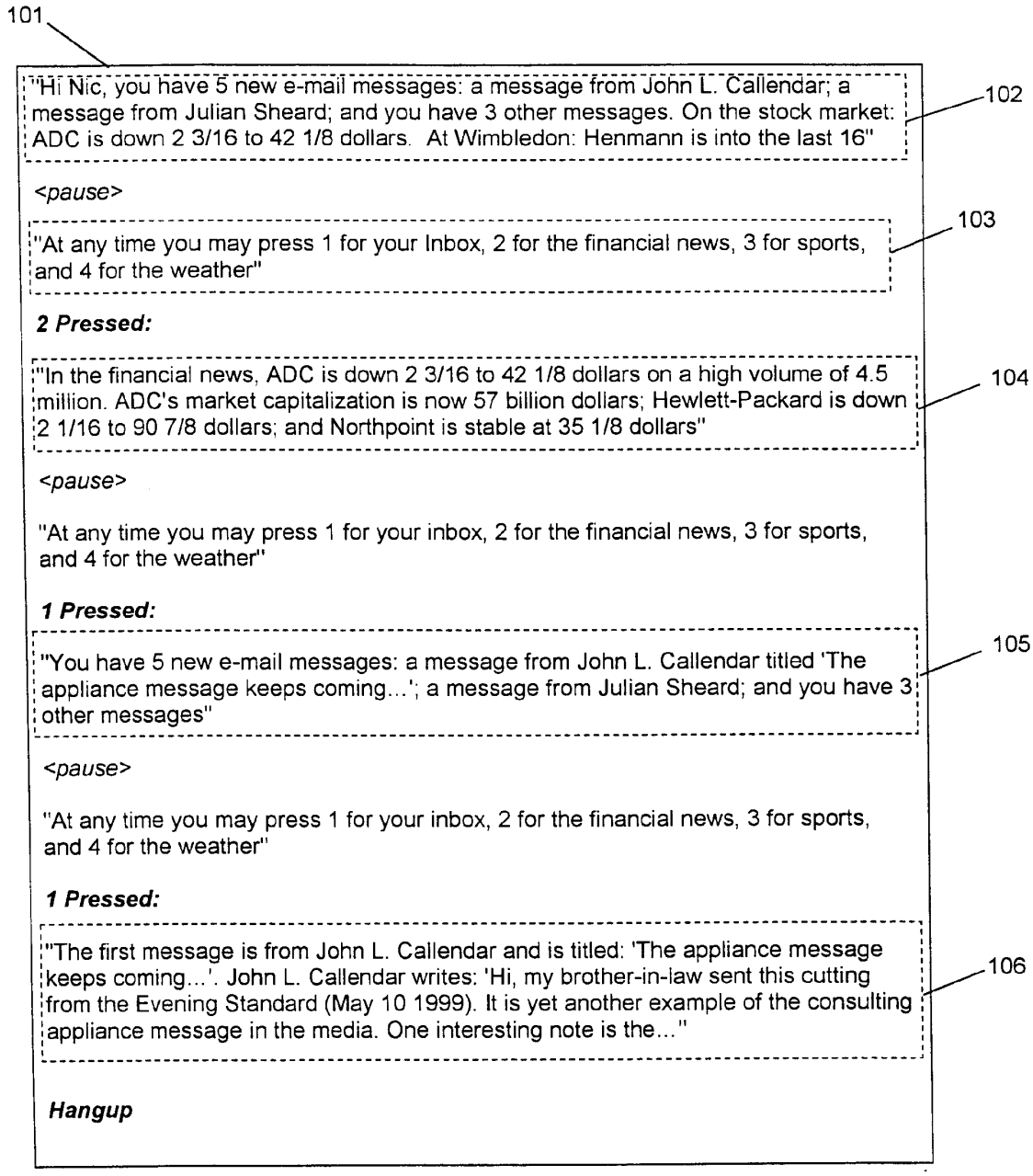

101
"Hi Nic, you have 5 new e-mail messages: a message from John L. Callendar; a message from Julian Sheard; and you have 3 other messages. On the stock market: ADC is down 2 3/16 to 42 1/8 dollars. At Wimbledon: Henmann is into the last 16"
102
<pause>
"At any time you may press 1 for your Inbox, 2 for the financial news, 3 for sports, and 4 for the weather"
103
2 Pressed:
"In the financial news, ADC is down 2 3/16 to 42 1/8 dollars on a high volume of 4.5 million. ADC's market capitalization is now 57 billion dollars; Hewlett-Packard is down 2 1/16 to 90 7/8 dollars; and Northpoint is stable at 35 1/8 dollars"
104
<pause>
"At any time you may press 1 for your inbox, 2 for the financial news, 3 for sports, and 4 for the weather"
1 Pressed:
"You have 5 new e-mail messages: a message from John L. Callendar titled 'The appliance message keeps coming...'; a message from Julian Sheard; and you have 3 other messages"
105
<pause>
"At any time you may press 1 for your inbox, 2 for the financial news, 3 for sports, and 4 for the weather"
1 Pressed:
"The first message is from John L. Callendar and is titled: 'The appliance message keeps coming...'. John L. Callendar writes: 'Hi, my brother-in-law sent this cutting from the Evening Standard (May 10 1999). It is yet another example of the consulting appliance message in the media. One interesting note is the..."
106
Hangup

FIG. 14

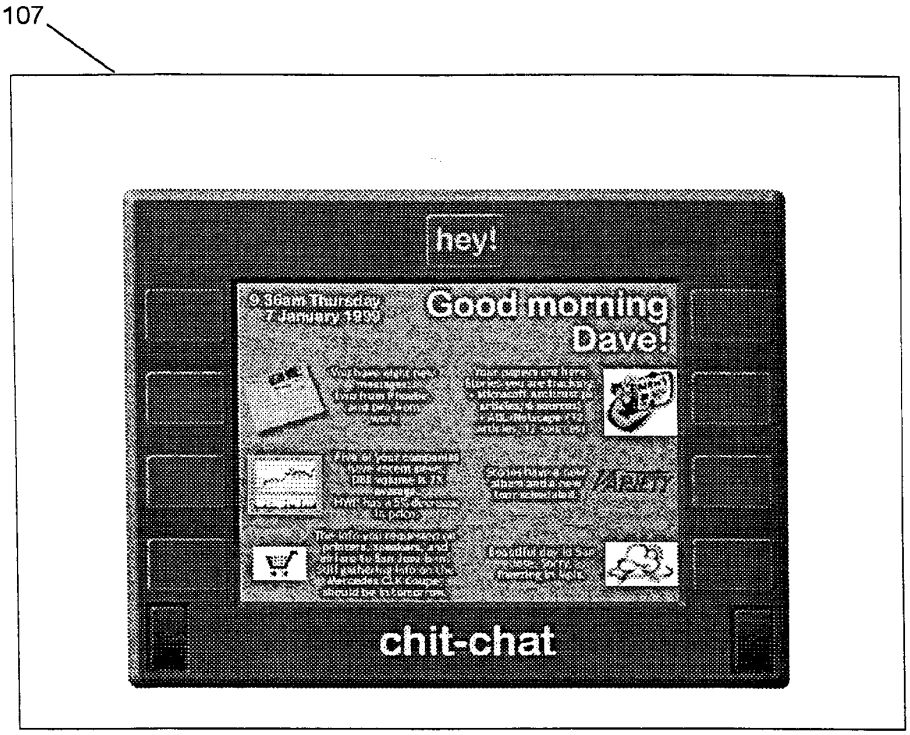


FIG. 15A

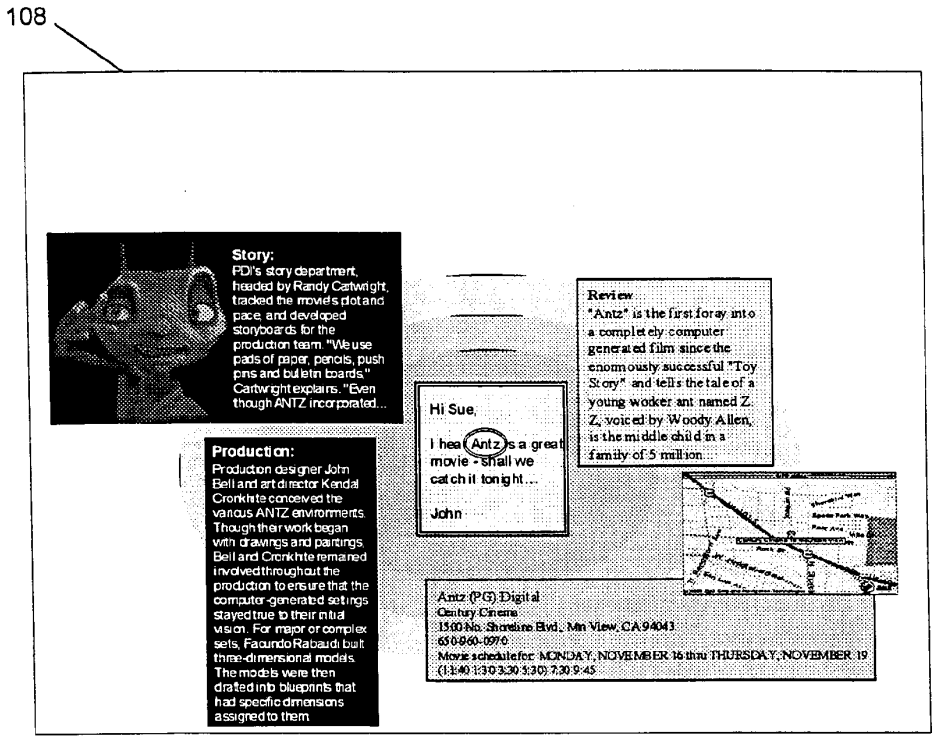

108
Story:
PDI's story department, headed by Randy Cartwright, tracked the movie's plot and pace, and developed storyboards for the production team. "We use pads of paper, pencils, push pins and bulletin boards," Cartwright explains. "Even though ANTZ incorporated...
Production:
Production designer John Bell and art director Kendal Cronkhite conceived the various ANTZ environments. Though their work began with drawings and paintings, Bell and Cronkhite remained involved throughout the production to ensure that the computer-generated settings stayed true to their initial vision. For major or complex sets, Facundo Rabaudi built three-dimensional models. The models were then drafted into blueprints that had specific dimensions assigned to them.
Hi Sue,
I hear Antz is a great movie - shall we catch it tonight...
John
Review
"Antz" is the first foray into a completely computer generated film since the enormously successful "Toy Story" and tells the tale of a young worker ant named Z. Z, voiced by Woody Allen, is the middle child in a family of 5 million.
Antz (PG) Digital
Century Cinema
1500 No. Shoreline Blvd., Mtn View, CA 94043
650 960-0970
Movie schedule for: MONDAY, NOVEMBER 16 thru THURSDAY, NOVEMBER 19
(1:1:40 1:30 3:30 5:30) 7:30 9:45

FIG. 15B

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US00/28514

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) :G06F 15/16, 173, 177

US CL : 709/217, 218, 219, 220, 221, 223, 224; 707/2, 104

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 709/217, 218, 219, 220, 221, 223, 224; 707/2, 104

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)

West Database, USPT, JPAB,EPAB,DWPI,TDBD

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y,P	US 6,009,442 A (CHEN et al) 28 December 1999, col. 6 line 46 et seq. and col. 7 line 4 et seq.	1-35
Y,P	US 5,995,943 A (BULL et al) 30 November 1999, col. 4 line 21 et seq.and col. 5 line 30 et seq.	1-35
Y	US 5,958,006 A (EGGLESTON et al) 28 September 1999, col. 3 line 20 et seq.	1-35
Y	US 5,901,287 A (BULL et al) 04 May 1999, col. 3 line 25 et seq.and col. 6 line 37 et seq.	1-35

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

*	Special categories of cited documents:	"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
"A"	document defining the general state of the art which is not considered to be of particular relevance	"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
"E"	earlier document published on or after the international filing date	"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
"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)	"&"	document member of the same patent family
"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		

Date of the actual completion of the international search 04 DECEMBER 2000	Date of mailing of the international search report 28 DEC 2000
Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703) 305-3230	Authorized officer MEHMET GECKIL James R. Matthews Telephone No. (703) 305-9676

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

Electronic Acknowledgement Receipt	
EFS ID:	47841112
Application Number:	90015063
International Application Number:	
Confirmation Number:	8395
Title of Invention:	DEVICE CAPABILITY BASED DISCOVERY PACKAGING AND PROVISIONING OF CONTENT FOR WIRELESS MOBILE DEVICES
First Named Inventor/Applicant Name:	7233790
Customer Number:	22913
Filer:	Levi S. Brown/Anne Frederickson
Filer Authorized By:	Levi S. Brown
Attorney Docket Number:	22104.12R
Receipt Date:	13-APR-2023
Filing Date:	23-JUN-2022
Time Stamp:	19:41:41
Application Type:	Reexam (Third Party)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Information Disclosure Statement (IDS) Form (SB08)	22104_12r_IDS.pdf	111854 f755197a05d4f595f2cc0d1af1f119a00756ab24	no	11

Warnings:

Information:					
This is not an USPTO supplied IDS fillable form					
2	Foreign Reference	FOR_1_JP03122712A_924267.pdf	331335 d31a64c7f13122635c8026e5da69462d809d45fd	no	6
Warnings:					
Information:					
3	Foreign Reference	FOR_2_JP2001175757A_924237.pdf	1149049 c032a226d85aee0395afbebb2ea2ef16e12c09ef	no	23
Warnings:					
Information:					
4	Foreign Reference	FOR_3_KR100741385B1_924305.pdf	1309510 2320a7a8ab2a02e0b786faba33d3123539274573	no	28
Warnings:					
Information:					
5	Foreign Reference	FOR_4_WO0127783A1_924277.pdf	2861131 bd05f485e3966e00fda32057e1249f53c61398ef	no	63
Warnings:					
Information:					
6	Non Patent Literature	NPL_1_920956_924296.pdf	338558 8c56cbb17de04b24ff2e651683ffc3eecde33507	no	1
Warnings:					
Information:					
7	Non Patent Literature	NPL_2_1005_924240.pdf	4568320 216bd3f3d40da4677b9ef87aad57fdc8073ca9f8	no	56
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Information:					
8	Non Patent Literature	NPL_3_1006_924298.pdf	1305803 f8e0d8a3711dbbcdb63ed61744cfbd525a6f35f1	no	24
Warnings:					
Information:					

9	Non Patent Literature	NPL_4_Infinitemass_924238.pdf	2712904 dffe77e27e768a618d57f891bcd5202d9a779fab	no	2
Warnings:					
Information:					
10	Non Patent Literature	NPL_5_1009_924270.pdf	471501 e99187693ca956513aa0c24cecad487e09209998	no	26
Warnings:					
Information:					
11	Non Patent Literature	NPL_6_Petition_for_In_924231.pdf	4943616 588981d8187f937f5856f536d4802011ae70dc05	no	86
Warnings:					
Information:					
12	Non Patent Literature	NPL_7_Rosenblum_1991__924286.pdf	470974 1a9ca221e639f0ad27a6579b288104785bee7bb2	no	15
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Information:					
13	Non Patent Literature	NPL_8_Satishkumar_199_924295.pdf	3764325 c0b8d3593c2bcd4457defbe26fc24b897161dd77	no	87
Warnings:					
Information:					
14	Non Patent Literature	NPL_9_1006_924389.pdf	14169167 02f4efce992642636ea8c279187976ae013312dc	no	24
Warnings:					
Information:					
15	Non Patent Literature	NPL_10_1008_002_924386.pdf	14798849 7f0de228e944ef8d697d6125fd7843ccefa09c6e	no	29
Warnings:					
Information:					

16	Non Patent Literature	NPL_11_1005_002_924388_Part0.pdf	23182404 10bbbf76b70a56d3843e38e0f6117a124c39a749	no	42
Warnings:					
Information:					
17	Non Patent Literature	NPL_12_1007_924385.pdf	13246986 e360a47c0acba536bd277d0659fb54a40890de0a	no	19
Warnings:					
Information:					
			Total Files Size (in bytes):	89736286	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 90/015,063	Filing Date 06/23/2022	☐ To be Mailed

ENTITY: ☑ LARGE ☐ SMALL ☐ MICRO

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA		RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A		N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A		N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*		x $100 =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*		x $480 =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).				
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))					
* If the difference in column 1 is less than zero, enter "0" in column 2.				TOTAL	

APPLICATION AS AMENDED - PART II

		(Column 1)		(Column 2)	(Column 3)			
AMENDMENT	05/16/2023	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 7	Minus	** 20	= 0		x $100 =	0
	Independent (37 CFR 1.16(h))	* 2	Minus	*** 3	= 0		x $480 =	0
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	0

		(Column 1)		(Column 2)	(Column 3)			
AMENDMENT		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=		x $0 =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=		x $0 =	
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.	LIE
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".	/PATRICIA F LEWIS/
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".	
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.	

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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LEVI S. BROWN
OFFICE DIRECT: 801-321-8823
EMAIL: lbrown@WNLAW.COM

FILED ELECTRONICALLY

PATENT APPLICATION
Docket No. 22104.12R

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:	US 7,233,790	)
		)
Serial No.:	90/015,063	) Art Unit
		) 3992
Filed:	June 23, 2022	)
		)
Conf. No.:	8395	)
		)
For:	DEVICE CAPABILITY BASED DISCOVERY PACKAGING AND PROVISIONING OF CONTENT FOR WIRELESS MOBILE DEVICES	)
		)
Examiner:	Matthew E. Heneghan	)
		)
Customer No.:	22913	)

AMENDMENT "B" AND RESPONSE
AFTER FINAL OFFICE ACTION IN EX PARTE REEXAMINATION
(AMENDMENT PLACES CLAIMS IN CONDITION FOR ALLOWANCE)

Mail Stop AF
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

The pending application is subject to an *ex parte* Reexamination. In response to a Final Office Action, which was mailed on April 10, 2023, please amend the above-identified application as follows:

Amendments to the Claims are reflected in the listing of claims which begins on page 2 of this paper.

Remarks/Arguments begin on page 10 of this paper.

AMENDMENTS TO THE CLAIMS

This listing of claims is to replace all prior versions, and listings, of claims in the pending application:

Listing of Claims:

1. (Twice Amended) A method of providing access to digital content for use on wireless communication devices, the method comprising:

receiving and storing in a server system a plurality of items of digital content to be made available for use in wireless communication devices used by a plurality of wireless services subscribers, including receiving and storing a plurality of different implementations of at least one of the items of digital content, where each implementation of any given item of digital content corresponds to a different set of device capabilities; [and]

operating the server system to maintain [maintaining] a product catalog containing a description of the items of digital content, wherein the product catalog includes[including], in association with each item of digital content, a reference to each implementation of said item of digital content[.];

receiving a request from one of the wireless communication devices;

in response to the request, selecting a portion of the product catalog to be presented on the one wireless communication device, based in part on device capabilities of the one wireless communication device; and

presenting the selected portion of the product catalog to the one wireless communication device, such that the selected portion, as presented, provides a single description of each item of digital content in said portion, regardless of a number of implementations that are available for each said item.

2. (Original) A method of providing access to digital content for use on wireless communication devices, the method comprising:

receiving and storing in a server system a plurality of items of digital content to be made available for use in wireless communication devices used by a plurality of wireless services subscribers, including receiving and storing a plurality of different implementations of at least one of the items of digital content, where each implementation of any given item of digital content corresponds to a different set of device capabilities;

operating the server system to maintain a product catalog containing a description of the items of digital content, wherein the product catalog includes, in association with each item of digital content, a reference to each implementation of said item of digital content;

receiving a request from a wireless device used by one of the subscribers;

in response to the request, selecting a portion of the product catalog to be presented to the subscriber, based on device capabilities of the wireless device used by the subscriber; and

presenting the selected portion of the product catalog to the subscriber via a wireless network, such that the selected portion, as presented to the subscriber, provides only a single description of each item of digital content in said portion, regardless of the number of implementations of each said item.

3. (Original) A method as recited in claim 2, wherein said selecting a portion of the product catalog comprises:

in response to the request, determining the identity of the wireless device used by the subscriber, wherein each implementation of the plurality of items of digital content has been previously associated in the server system with at least one device identity, according to corresponding device capabilities supported by the implementation; and

selecting the portion of the product catalog to be presented to the subscriber based on the identity of the wireless device used by the subscriber.

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

receiving from the subscriber a request for one of the items of digital content in said portion of the product catalog;

selecting an implementation of the requested item of digital content, based on device capabilities of the wireless device used by the subscriber; and

downloading the selected implementation of the item of digital content to the wireless device used by the subscriber.

5. (Original) A method as recited in claim 4, further comprising associating each of the items of digital content in the server system with a plurality of different provisioning models, each of the provisioning models corresponding to a different set of device capabilities, each provisioning model including a provisioning protocol and a corresponding set of provisioning attributes and descriptors for provisioning digital content in wireless devices.

6. (Original) A method as recited in claim 5, further comprising:

receiving from the subscriber a request for one of the items of digital content in said portion of the product catalog;

identifying device capabilities of the wireless device used by the subscriber;

selecting one of a plurality of provisioning models associated with the requested item in the server system, based on the device capabilities of the wireless device used by the subscriber;

packaging the requested item according to the selected provisioning model; and

provisioning the requested item in the wireless device used by the subscriber according to the selected provisioning model.

7. (Original) A method as recited in claim 6, wherein:

said packaging the requested item comprises creating a provisioning descriptor for the requested item according to the selected provisioning model, and associating the provisioning descriptor with the requested item; and

said provisioning the requested item in the wireless device comprises sending the packaged requested item to the wireless device used by the subscriber according to a provisioning protocol associated with the selected provisioning model.

8. (Twice Amended) A system that provides access to digital content for use on wireless communication devices, said system comprising:

a network interface through which to communicate over a communication network; and

a download manager to:

receive and store a plurality of items of digital content to be made available for use in wireless communication devices used by a plurality of wireless telecommunications subscribers, including receiving and storing a plurality of different implementations of at least one of the items of digital content, where each implementation of any given item of digital content corresponds to a different set of device capabilities; [and]

maintain a product catalog containing a description of the items of digital content, wherein the product catalog includes[including], in association with each item of digital content, a reference to each implementation of said item of digital content[.];

receive a request from one of the wireless communication devices;

in response to the request, select a portion of the product catalog to be presented on the one wireless communication device, based in part on device capabilities of the one wireless communication device; and

present the selected portion of the product catalog to the one wireless communication device, such that the selected portion, as presented, provides a single description of each item of digital content in said portion, regardless of a number of implementations that are available for each said item.

9. (Original) A system comprising:

a processor; and

a storage facility accessible to the processor and containing code which, when executed by the processor, causes the processing system to receive and store a plurality of items of digital content to be made available for use in wireless communication devices used by a plurality of wireless telecommunications subscribers, including receiving and storing a plurality of different implementations of at least one of the items of digital content, where each implementation of any given item of digital content corresponds to a different set of device capabilities;

maintain a product catalog containing a description of the items of digital content, wherein the product catalog includes, in association with each item of digital content, a reference to each implementation of said item of digital content;

receive a request from a wireless device used by one of the subscribers;

in response to the request, select a portion of the product catalog to be presented to the subscriber, based on device capabilities of the wireless device used by the subscriber; and

cause the selected portion of the product catalog to be presented to the subscriber via a wireless telecommunications network, such that the selected portion, as presented to the subscriber, provides only a single description of each item of digital content in said portion, regardless of the number of implementations of each said item.

10. (Original) A system as recited in claim 9, wherein selection of said portion of the product catalog comprises:

in response to the request, determining the identity of the wireless device used by the subscriber, wherein each implementation of the plurality of items of digital content has been previously associated in the server system with at least one device identity, according to corresponding device capabilities supported by the implementation; and

selecting the portion of the product catalog to be presented to the subscriber based on the identity of the wireless device used by the subscriber.

11. (Original) A system as recited in claim 10, wherein said storage facility further contains code which, when executed by the processor, causes the processing system to:

receive from the subscriber a request for one of the items of digital content in said portion of the product catalog;

select an implementation of the requested item of digital content, based on device capabilities of the wireless device used by the subscriber; and

download the selected implementation of the item of digital content to the wireless device used by the subscriber.

12. (Original) A system as recited in claim 11, wherein said storage facility further contains code which, when executed by the processor, causes the processing system to:

associate each of the items of digital content in the server system with a plurality of different provisioning models, each of the provisioning models corresponding to a different set of device capabilities, each of the provisioning models including a provisioning protocol and a corresponding set of provisioning attributes and descriptors for provisioning digital content in wireless devices.

13. (Original) A system as recited in claim 12, wherein said storage facility further contains code which, when executed by the processor, causes the processing system to:

receive from the subscriber a request for one of the items of digital content in said portion of the product catalog;

identify device capabilities of the wireless device used by the subscriber;

select one of a plurality of provisioning models associated with the requested item in the server system, based on the device capabilities of the wireless device used by the subscriber;

package the requested item according to the selected provisioning model; and

provision the requested item in the wireless device used by the subscriber according to the selected provisioning model.

14. (Original) A system as recited in claim 13, wherein packaging the requested item comprises creating a provisioning descriptor for the requested item according to the selected provisioning model, and associating the provisioning descriptor with the requested item; and

wherein provisioning the requested item in the wireless device comprises sending the packaged requested item to the wireless device used by the subscriber according to a provisioning protocol associated with the selected provisioning model.

REMARKS

The Final Office Action for the pending *ex parte* Reexamination was mailed on April 10, 2023. The Office Action considered claims 1, 2, 4, 8, and 9. Claims 3, 5, 6, 7, 10, 11, 12, 13, and 14 were not considered. Claims 2, 4, and 9 were confirmed. Claims 1 and 8 were rejected.

By this paper, claims 1 and 8 are amended. No claims have been added or canceled.

Status Regarding Claim Amendments

As indicated above, the present application includes pending claims 1-14, with claims 1, 2, 8, and 9 being independent claims. With this amendment, Applicant has amended independent claims 1 and 8, as described below. Support for the amendments can be found throughout US 7,233,790. Specific passages of support from the '790 patent publication are referenced below. These amendments are designed to place the application in a condition for allowance.

Claim 1

Claim 1 was amended in lines 1, 3, 6, 9, 10, 11, and 18 to include the term "digital" as it relates to the "content" that is being used by the devices. Support for "digital content" can be found, for example, in col. 3 ln. 45-50.

Previously, claim 1 was amended to substitute the phrase "content consuming devices" for "wireless communication devices" and to remove the limitations related to the "wireless services subscribers." By this paper, the claims have been reverted back to using the phrases "wireless communication devices" and "wireless services subscribers."

Claim 1 was amended to recite a "server system" in lines 3 and 8. Support for this amendment can be found, for example, in col. 3 ln. 65-67.

Claim 1 was amended to recite receiving "and storing" the different implementations in ln 5. Support for this amendment can be found, for example, in col. 11 ln. 56-58.

In claim 1, the term "maintaining" was changed to "maintain" in line 8 to ensure proper grammar.

In claim 1, the term "including" was changed to "includes" in line 9 to also ensure proper grammar.

Claim 1 was amended to include the following limitation in ln. 13: "receiving a request from one of the wireless communication devices." Support for this amendment can be found, for example, in col. 12 ln. 9-13.

Claim 1 was amended to include the following limitation in ln. 14-16: "in response to the request, selecting a portion of the product catalog to be presented on the one wireless communication device, based in part on device capabilities of the one wireless communication device." Support for these amendments can be found, for example, in col. 9 ln. 13-18 as well as col 9 ln. 37-62.

Claim 1 was amended to include the following limitation in ln. 17-20: "presenting the selected portion of the product catalog to the one wireless communication device, such that the selected portion, as presented, provides a single description of each item of digital content in said portion, regardless of a number of implementations that are available for each said item." Support for this amendment can be found, for example, in col. 9 ln. 49-56.

Claim 8

Claim 8 was amended to include the following limitation in ln. 1-2: "that provides access to digital content for use on wireless communication devices, said system…" Support for the amendment can be found, for example, in col. 3 ln 45-57 as well as col. 4 ln. 23-25.

Previously, claim 8 was amended to replace the phrase "download manager" with "application server" in ln 4. By this paper, the claim language has been reverted back to using the phrase "download manager."

Claim 8 was amended in lines 5, 8, 9, 10, 11, 12, and 19 to include the term "digital" as it relates to the "content" that is being used by the devices. Support for "digital content" can be found, for example, in col. 3 ln. 45-50.

Previously, claim 8 was amended to substitute the phrase "content consuming devices" for "wireless communication devices" and to remove the phrase "wireless telecommunications

subscribers." By this paper, the claim language has been reverted back to using the phrase "wireless communication devices" and "wireless telecommunications subscribers."

Claim 8 was amended to recite receiving "and storing" the different implementations in ln 7. Support for this amendment can be found, for example, in col. 11 ln. 56-58.

In claim 8, the term "including" was changed to "includes" in line 11 to also ensure proper grammar.

Claim 8 was amended to include the following limitation in ln. 13: "receive a request from one of the wireless communication devices." Support for this amendment can be found, for example, in col. 12 ln. 9-13.

Claim 8 was amended to include the following limitation in ln. 14-16: "in response to the request, select a portion of the product catalog to be presented on the one wireless communication device, based in part on device capabilities of the one wireless communication device." Support for these amendments can be found, for example, in col. 9 ln. 13-18 as well as col. 9 ln. 37-62.

Claim 8 was further amended to include the following limitation in ln. 17-20: "present the selected portion of the product catalog to the one wireless communication device, such that the selected portion, as presented, provides a single description of each item of digital content in said portion, regardless of a number of implementations that are available for each said item." Support for this amendment can be found, for example, in col. 9 ln. 49-56.

Introductory Discussion Of The Claims

Independent claims 1 and 8 are directed to embodiments that provide access to digital content for use on wireless communication devices. Claim 1, for example, is focused on a method that includes receiving and storing (e.g., in a server system) multiple items of digital content that are accessible by the wireless communication devices, which are used by wireless services subscribers. This action includes receiving and storing multiple different implementations of at least one of the items of digital content, where each implementation corresponds to a different set of device capabilities.

The method includes operating the server system to maintain a product catalog. This catalog includes a description of the items of digital content. The product catalog includes, in association with each item of digital content, a reference to each implementation.

The method also includes an action of receiving a request from one of the wireless communication devices. In response, a portion of the product catalog is selected to be presented on the one wireless communication device. This selection is based in part on the device capabilities of the one wireless communication device.

The method then involves presenting the selected portion of the product catalog to the one wireless communication device. As a result, the selected portion, as presented, provides a single description of each item of digital content in the portion, regardless of the number of implementations that are available for each item.

35 U.S.C. §305 Rejections

Claims 1 and 8 were rejected under 35 U.S.C. §305 as enlarging the scope of the claims of the patent being reexamined. Pages 4-5 of the Office state the following: "Claims 1 and 8 no longer encompass a method (in the case of claim 1) or a system (in the case of claim 8) in which 'a plurality of items of … content to be made available in wireless communication … devices used by a plurality of wireless subscribers,' as recited in the claims of the '790 patent." "They are therefore impermissibly enlarging in scope."

By this paper, claims 1 and 8 have been amended to reincorporate the limitations related to the "wireless communication devices" and the "wireless services subscribers," as originally presented in the '790 patent. In view of these amendments, Applicant respectfully submits that the claims are now in accordance with 35 U.S.C. 305. Consequently, Applicant submits that these rejections are now moot and should be withdrawn.

Allowable Subject Matter

Claims 2, 4, and 9 were confirmed. The Office indicated that claims 1 and 8 would be patentable if rewritten or amended to overcome the rejections under 35 U.S.C. 305. As discussed

above and in view of the current amendments, Applicant submits that claims 1 and 8 are now in a state for immediate allowance.

In the event that the Examiner finds remaining impediment to a prompt allowance of this application that may be clarified through a telephone interview, the Examiner is requested to contact the undersigned attorney at 801-533-9800.

The Commissioner is hereby authorized to charge payment of any of the following fees that may be applicable to this communication, or credit any overpayment, to Deposit Account No. 23-3178: (1) any filing fees required under 37 CFR § 1.16; (2) any patent application and reexamination processing fees under 37 CFR § 1.17; and/or (3) any post issuance fees under 37 CFR § 1.20. In addition, if any additional extension of time is required, which has not otherwise been requested, please consider this a petition therefore and charge any additional fees that may be required to Deposit Account No. 23-3178.

Dated this 16th day of May 2023.

Respectfully submitted,

/Levi S. Brown/

LEVI S. BROWN
Registration No. 72,533
WORKMAN NYDEGGER
Attorney for Applicant
Customer No. 22913

LSB:jme

Electronic Acknowledgement Receipt	
EFS ID:	48013285
Application Number:	90015063
International Application Number:	
Confirmation Number:	8395
Title of Invention:	DEVICE CAPABILITY BASED DISCOVERY PACKAGING AND PROVISIONING OF CONTENT FOR WIRELESS MOBILE DEVICES
First Named Inventor/Applicant Name:	7233790
Customer Number:	22913
Filer:	Levi S. Brown/JENNIFER ESCAMILLA
Filer Authorized By:	Levi S. Brown
Attorney Docket Number:	22104.12R
Receipt Date:	16-MAY-2023
Filing Date:	23-JUN-2022
Time Stamp:	19:11:29
Application Type:	Reexam (Third Party)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		22104-12R-2023-05-16-Amendment-B.pdf	166854 acfdef0f3c1a1db488a846400821c58e70df7513	yes	14

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Response After Final Action	1	1
	Claims	2	9
	Applicant Arguments/Remarks Made in an Amendment	10	14
Warnings:			
Information:			
	Total Files Size (in bytes):	166854	

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New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.
National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.
New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
90/015,063	06/23/2022	7233790	22104.12R	8395

22913 7590 05/31/2023

Workman Nydegger
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EXAMINER	
HENEGHAN, MATTHEW E	

ART UNIT	PAPER NUMBER
3992	

MAIL DATE	DELIVERY MODE
05/31/2023	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

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EX PARTE REEXAMINATION COMMUNICATION TRANSMITTAL FORM

REEXAMINATION CONTROL NO. *90/015,063* .

PATENT UNDER REEXAMINATION *7233790* .

ART UNIT *3992* .

Enclosed is a copy of the latest communication from the United States Patent and Trademark Office in the above identified *ex parte* reexamination proceeding (37 CFR 1.550(f)).

Where this copy is supplied after the reply by requester, 37 CFR 1.535, or the time for filing a reply has passed, no submission on behalf of the *ex parte* reexamination requester will be acknowledged or considered (37 CFR 1.550(g)).

PTOL-465 (Rev.07-04)

Notice Of Defective Paper In Ex Parte Reexamination – Third Party Requested	Control Number	Patent Under Reexamination	
	90/015,063	7233790	
	Examiner	Art Unit	AIA (FITF) Status
	MATTHEW E HENEGHAN	3992	No

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

1. ☑ Since no proof of service was included with the paper filed on 16 May 2023, it fails to comply with 37 CFR 1.248 and 1.540. Proof of service is required within ONE (1) MONTH or THIRTY (30) DAYS from the mailing date of this letter, whichever is longer . Failure to provide proof of service may result in a refusal to consider the paper. If the failure to comply with this requirement results in a patent owner failure to file a timely and appropriate response to any Office action or any written statement of an interview required under 37 CFR 1.560(b), the prosecution of the reexamination proceeding will be terminated under 37 CFR 1.550(d).

2. ☐ The paper filed on _____ is unsigned. A duplicate paper or ratification, properly signed, is required within ONE (1) MONTH or THIRTY (30) DAYS from the mailing date of this letter, whichever is longer. Failure to comply with this requirement will result in the paper not being considered. If the failure to comply results in a patent owner failure to file a timely and appropriate response to any Office action or any written statement of an interview required under 37 CFR 1.560(b), the prosecution of the reexamination proceeding will be terminated under 37 CFR 1.550(d).

3. ☐ The paper filed on _____ is signed by _____ , who is not of record. A duplicate paper or ratification signed by a person of record , a person made of record by way of a new power of attorney, is required within ONE (1) MONTH or THIRTY (30) DAYS from the mailing date of this letter, whichever is longer. Failure to comply with this requirement will result in the paper not being considered. If the failure to comply results in a patent owner failure to file a timely and appropriate response to any Office action or any written statement of an interview required under § 1.560(b), the prosecution of the reexamination proceeding will be terminated under 37 CFR 1.550(d).

4. ☐ The Amendment filed on _____ does not comply with 37 CFR 1.530(d)-(j). Patent owner is given ONE (1) MONTH or THIRTY (30) DAYS from the mailing date of this letter, whichever is longer to correct this informality; otherwise, the prosecution of the reexamination proceeding will be terminated under (37 CFR 1.550(d)).

5. ☐ The Amendment filed by patent owner on _____, does not comply with 37 CFR ☐ 1.20(c)(3) and/or ☐ 1.20(c)(4), as to excess claim fees. Patent owner is given a time period of ONE (1) MONTH or THIRTY (30)DAYS from the mailing date of this letter, whichever is longer, to correct this fee deficiency, or the prosecution of the reexamination proceeding will be terminated under 37 CFR 1.550(d), to effect the "abandonment" set forth in 37 CFR 1.20(c)(5).

6. ☐ Other:

_____

NOTE: EXTENSIONS OF TIME ARE GOVERNED BY 37 CFR 1.550(c). See 37 CFR 1.550(c)(1) and (c)(2). If the period for response specified above is less than thirty (30) days, a response within the statutory minimum of thirty (30) days will be considered timely.

	/MICHAEL FUELLING/ Supervisory Patent Examiner, Art Unit 3992	/MATTHEW E HENEGHAN/ Primary Examiner, Art Unit 3992

cc: Requester (if third party requester)

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FILED ELECTRONICALLY

PATENT APPLICATION
Docket No. 22104.12R

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:	US 7,233,790	)
		)
Serial No.:	90/015,063	) Art Unit
		) 3992
Filed:	June 23, 2022	)
		)
Conf. No.:	8395	)
		)
For:	DEVICE CAPABILITY BASED DISCOVERY PACKAGING AND PROVISIONING OF CONTENT FOR WIRELESS MOBILE DEVICES	)
		)
Examiner:	Matthew E. Heneghan	)
		)
Customer No.:	22913	)

AMENDMENT "B" AND RESPONSE
AFTER FINAL OFFICE ACTION IN EX PARTE REEXAMINATION
(AMENDMENT PLACES CLAIMS IN CONDITION FOR ALLOWANCE)

Mail Stop AF
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

The pending application is subject to an *ex parte* Reexamination. In response to a Final Office Action, which was mailed on April 10, 2023, and in response to a Notice of Defective Paper, which was mailed on May 31, 2023, please amend the above-identified application as follows:

Amendments to the Claims are reflected in the listing of claims which begins on page 2 of this paper.

Remarks/Arguments begin on page 10 of this paper.

Certificate of Service is provided on page 15 of this paper.

AMENDMENTS TO THE CLAIMS

This listing of claims is to replace all prior versions, and listings, of claims in the pending application:

Listing of Claims:

1. (Twice Amended) A method of providing access to digital content for use on wireless communication devices, the method comprising:

receiving and storing in a server system a plurality of items of digital content to be made available for use in wireless communication devices used by a plurality of wireless services subscribers, including receiving and storing a plurality of different implementations of at least one of the items of digital content, where each implementation of any given item of digital content corresponds to a different set of device capabilities; [and]

operating the server system to maintain [maintaining] a product catalog containing a description of the items of digital content, wherein the product catalog includes[including], in association with each item of digital content, a reference to each implementation of said item of digital content[.];

receiving a request from one of the wireless communication devices;

in response to the request, selecting a portion of the product catalog to be presented on the one wireless communication device, based in part on device capabilities of the one wireless communication device; and

presenting the selected portion of the product catalog to the one wireless communication device, such that the selected portion, as presented, provides a single description of each item of digital content in said portion, regardless of a number of implementations that are available for each said item.

2. (Original) A method of providing access to digital content for use on wireless communication devices, the method comprising:

receiving and storing in a server system a plurality of items of digital content to be made available for use in wireless communication devices used by a plurality of wireless services subscribers, including receiving and storing a plurality of different implementations of at least one of the items of digital content, where each implementation of any given item of digital content corresponds to a different set of device capabilities;

operating the server system to maintain a product catalog containing a description of the items of digital content, wherein the product catalog includes, in association with each item of digital content, a reference to each implementation of said item of digital content;

receiving a request from a wireless device used by one of the subscribers;

in response to the request, selecting a portion of the product catalog to be presented to the subscriber, based on device capabilities of the wireless device used by the subscriber; and

presenting the selected portion of the product catalog to the subscriber via a wireless network, such that the selected portion, as presented to the subscriber, provides only a single description of each item of digital content in said portion, regardless of the number of implementations of each said item.

3. (Original) A method as recited in claim 2, wherein said selecting a portion of the product catalog comprises:

in response to the request, determining the identity of the wireless device used by the subscriber, wherein each implementation of the plurality of items of digital content has been previously associated in the server system with at least one device identity, according to corresponding device capabilities supported by the implementation; and

selecting the portion of the product catalog to be presented to the subscriber based on the identity of the wireless device used by the subscriber.

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

receiving from the subscriber a request for one of the items of digital content in said portion of the product catalog;

selecting an implementation of the requested item of digital content, based on device capabilities of the wireless device used by the subscriber; and

downloading the selected implementation of the item of digital content to the wireless device used by the subscriber.

5. (Original) A method as recited in claim 4, further comprising associating each of the items of digital content in the server system with a plurality of different provisioning models, each of the provisioning models corresponding to a different set of device capabilities, each provisioning model including a provisioning protocol and a corresponding set of provisioning attributes and descriptors for provisioning digital content in wireless devices.

6. (Original) A method as recited in claim 5, further comprising:

receiving from the subscriber a request for one of the items of digital content in said portion of the product catalog;

identifying device capabilities of the wireless device used by the subscriber;

selecting one of a plurality of provisioning models associated with the requested item in the server system, based on the device capabilities of the wireless device used by the subscriber;

packaging the requested item according to the selected provisioning model; and

provisioning the requested item in the wireless device used by the subscriber according to the selected provisioning model.

7. (Original) A method as recited in claim 6, wherein:

said packaging the requested item comprises creating a provisioning descriptor for the requested item according to the selected provisioning model, and associating the provisioning descriptor with the requested item; and

said provisioning the requested item in the wireless device comprises sending the packaged requested item to the wireless device used by the subscriber according to a provisioning protocol associated with the selected provisioning model.

8. (Twice Amended) A system that provides access to digital content for use on wireless communication devices, said system comprising:

a network interface through which to communicate over a communication network; and

a download manager to:

receive and store a plurality of items of digital content to be made available for use in wireless communication devices used by a plurality of wireless telecommunications subscribers, including receiving and storing a plurality of different implementations of at least one of the items of digital content, where each implementation of any given item of digital content corresponds to a different set of device capabilities; [and]

maintain a product catalog containing a description of the items of digital content, wherein the product catalog includes[including], in association with each item of digital content, a reference to each implementation of said item of digital content[.];

receive a request from one of the wireless communication devices;

in response to the request, select a portion of the product catalog to be presented on the one wireless communication device, based in part on device capabilities of the one wireless communication device; and

present the selected portion of the product catalog to the one wireless communication device, such that the selected portion, as presented, provides a single description of each item of digital content in said portion, regardless of a number of implementations that are available for each said item.

9. (Original) A system comprising:

a processor; and

a storage facility accessible to the processor and containing code which, when executed by the processor, causes the processing system to receive and store a plurality of items of digital content to be made available for use in wireless communication devices used by a plurality of wireless telecommunications subscribers, including receiving and storing a plurality of different implementations of at least one of the items of digital content, where each implementation of any given item of digital content corresponds to a different set of device capabilities;

maintain a product catalog containing a description of the items of digital content, wherein the product catalog includes, in association with each item of digital content, a reference to each implementation of said item of digital content;

receive a request from a wireless device used by one of the subscribers;

in response to the request, select a portion of the product catalog to be presented to the subscriber, based on device capabilities of the wireless device used by the subscriber; and

cause the selected portion of the product catalog to be presented to the subscriber via a wireless telecommunications network, such that the selected portion, as presented to the subscriber, provides only a single description of each item of digital content in said portion, regardless of the number of implementations of each said item.

10. (Original) A system as recited in claim 9, wherein selection of said portion of the product catalog comprises:

in response to the request, determining the identity of the wireless device used by the subscriber, wherein each implementation of the plurality of items of digital content has been previously associated in the server system with at least one device identity, according to corresponding device capabilities supported by the implementation; and

selecting the portion of the product catalog to be presented to the subscriber based on the identity of the wireless device used by the subscriber.

11. (Original) A system as recited in claim 10, wherein said storage facility further contains code which, when executed by the processor, causes the processing system to:

receive from the subscriber a request for one of the items of digital content in said portion of the product catalog;

select an implementation of the requested item of digital content, based on device capabilities of the wireless device used by the subscriber; and

download the selected implementation of the item of digital content to the wireless device used by the subscriber.

12. (Original) A system as recited in claim 11, wherein said storage facility further contains code which, when executed by the processor, causes the processing system to:

associate each of the items of digital content in the server system with a plurality of different provisioning models, each of the provisioning models corresponding to a different set of device capabilities, each of the provisioning models including a provisioning protocol and a corresponding set of provisioning attributes and descriptors for provisioning digital content in wireless devices.

13. (Original) A system as recited in claim 12, wherein said storage facility further contains code which, when executed by the processor, causes the processing system to:

receive from the subscriber a request for one of the items of digital content in said portion of the product catalog;

identify device capabilities of the wireless device used by the subscriber;

select one of a plurality of provisioning models associated with the requested item in the server system, based on the device capabilities of the wireless device used by the subscriber;

package the requested item according to the selected provisioning model; and

provision the requested item in the wireless device used by the subscriber according to the selected provisioning model.

14. (Original) A system as recited in claim 13, wherein packaging the requested item comprises creating a provisioning descriptor for the requested item according to the selected provisioning model, and associating the provisioning descriptor with the requested item; and

wherein provisioning the requested item in the wireless device comprises sending the packaged requested item to the wireless device used by the subscriber according to a provisioning protocol associated with the selected provisioning model.

REMARKS

The Final Office Action for the pending *ex parte* Reexamination was mailed on April 10, 2023. A Notice of Defective Paper was mailed on May 31, 2023. The Final Office Action considered claims 1, 2, 4, 8, and 9. Claims 3, 5, 6, 7, 10, 11, 12, 13, and 14 were not considered. Claims 2, 4, and 9 were confirmed. Claims 1 and 8 were rejected.

By this paper, claims 1 and 8 are amended. No claims have been added or canceled.

Status Regarding Claim Amendments

As indicated above, the present application includes pending claims 1-14, with claims 1, 2, 8, and 9 being independent claims. With this amendment, Applicant has amended independent claims 1 and 8, as described below. Support for the amendments can be found throughout US 7,233,790. Specific passages of support from the '790 patent publication are referenced below. These amendments are designed to place the application in a condition for allowance.

Claim 1

Claim 1 was amended in lines 1, 3, 6, 9, 10, 11, and 18 to include the term "digital" as it relates to the "content" that is being used by the devices. Support for "digital content" can be found, for example, in col. 3 ln. 45-50.

Previously, claim 1 was amended to substitute the phrase "content consuming devices" for "wireless communication devices" and to remove the limitations related to the "wireless services subscribers." By this paper, the claims have been reverted back to using the phrases "wireless communication devices" and "wireless services subscribers."

Claim 1 was amended to recite a "server system" in lines 3 and 8. Support for this amendment can be found, for example, in col. 3 ln. 65-67.

Claim 1 was amended to recite receiving "and storing" the different implementations in ln 5. Support for this amendment can be found, for example, in col. 11 ln. 56-58.

In claim 1, the term "maintaining" was changed to "maintain" in line 8 to ensure proper grammar.

In claim 1, the term "including" was changed to "includes" in line 9 to also ensure proper grammar.

Claim 1 was amended to include the following limitation in ln. 13: "receiving a request from one of the wireless communication devices." Support for this amendment can be found, for example, in col. 12 ln. 9-13.

Claim 1 was amended to include the following limitation in ln. 14-16: "in response to the request, selecting a portion of the product catalog to be presented on the one wireless communication device, based in part on device capabilities of the one wireless communication device." Support for these amendments can be found, for example, in col. 9 ln. 13-18 as well as col 9 ln. 37-62.

Claim 1 was amended to include the following limitation in ln. 17-20: "presenting the selected portion of the product catalog to the one wireless communication device, such that the selected portion, as presented, provides a single description of each item of digital content in said portion, regardless of a number of implementations that are available for each said item." Support for this amendment can be found, for example, in col. 9 ln. 49-56.

Claim 8

Claim 8 was amended to include the following limitation in ln. 1-2: "that provides access to digital content for use on wireless communication devices, said system…" Support for the amendment can be found, for example, in col. 3 ln 45-57 as well as col. 4 ln. 23-25.

Previously, claim 8 was amended to replace the phrase "download manager" with "application server" in ln 4. By this paper, the claim language has been reverted back to using the phrase "download manager."

Claim 8 was amended in lines 5, 8, 9, 10, 11, 12, and 19 to include the term "digital" as it relates to the "content" that is being used by the devices. Support for "digital content" can be found, for example, in col. 3 ln. 45-50.

Previously, claim 8 was amended to substitute the phrase "content consuming devices" for "wireless communication devices" and to remove the phrase "wireless telecommunications

subscribers." By this paper, the claim language has been reverted back to using the phrase "wireless communication devices" and "wireless telecommunications subscribers."

Claim 8 was amended to recite receiving "and storing" the different implementations in ln 7. Support for this amendment can be found, for example, in col. 11 ln. 56-58.

In claim 8, the term "including" was changed to "includes" in line 11 to also ensure proper grammar.

Claim 8 was amended to include the following limitation in ln. 13: "receive a request from one of the wireless communication devices." Support for this amendment can be found, for example, in col. 12 ln. 9-13.

Claim 8 was amended to include the following limitation in ln. 14-16: "in response to the request, select a portion of the product catalog to be presented on the one wireless communication device, based in part on device capabilities of the one wireless communication device." Support for these amendments can be found, for example, in col. 9 ln. 13-18 as well as col. 9 ln. 37-62.

Claim 8 was further amended to include the following limitation in ln. 17-20: "present the selected portion of the product catalog to the one wireless communication device, such that the selected portion, as presented, provides a single description of each item of digital content in said portion, regardless of a number of implementations that are available for each said item." Support for this amendment can be found, for example, in col. 9 ln. 49-56.

Introductory Discussion Of The Claims

Independent claims 1 and 8 are directed to embodiments that provide access to digital content for use on wireless communication devices. Claim 1, for example, is focused on a method that includes receiving and storing (e.g., in a server system) multiple items of digital content that are accessible by the wireless communication devices, which are used by wireless services subscribers. This action includes receiving and storing multiple different implementations of at least one of the items of digital content, where each implementation corresponds to a different set of device capabilities.

The method includes operating the server system to maintain a product catalog. This catalog includes a description of the items of digital content. The product catalog includes, in association with each item of digital content, a reference to each implementation.

The method also includes an action of receiving a request from one of the wireless communication devices. In response, a portion of the product catalog is selected to be presented on the one wireless communication device. This selection is based in part on the device capabilities of the one wireless communication device.

The method then involves presenting the selected portion of the product catalog to the one wireless communication device. As a result, the selected portion, as presented, provides a single description of each item of digital content in the portion, regardless of the number of implementations that are available for each item.

35 U.S.C. §305 Rejections

Claims 1 and 8 were rejected under 35 U.S.C. §305 as enlarging the scope of the claims of the patent being reexamined. Pages 4-5 of the Office state the following: "Claims 1 and 8 no longer encompass a method (in the case of claim 1) or a system (in the case of claim 8) in which 'a plurality of items of … content to be made available in wireless communication … devices used by a plurality of wireless subscribers,' as recited in the claims of the '790 patent." "They are therefore impermissibly enlarging in scope."

By this paper, claims 1 and 8 have been amended to reincorporate the limitations related to the "wireless communication devices" and the "wireless services subscribers," as originally presented in the '790 patent. In view of these amendments, Applicant respectfully submits that the claims are now in accordance with 35 U.S.C. 305. Consequently, Applicant submits that these rejections are now moot and should be withdrawn.

Allowable Subject Matter

Claims 2, 4, and 9 were confirmed. The Office indicated that claims 1 and 8 would be patentable if rewritten or amended to overcome the rejections under 35 U.S.C. 305. As discussed

above and in view of the current amendments, Applicant submits that claims 1 and 8 are now in a state for immediate allowance.

In the event that the Examiner finds remaining impediment to a prompt allowance of this application that may be clarified through a telephone interview, the Examiner is requested to contact the undersigned attorney at 801-533-9800.

The Commissioner is hereby authorized to charge payment of any of the following fees that may be applicable to this communication, or credit any overpayment, to Deposit Account No. 23-3178: (1) any filing fees required under 37 CFR § 1.16; (2) any patent application and reexamination processing fees under 37 CFR § 1.17; and/or (3) any post issuance fees under 37 CFR § 1.20. In addition, if any additional extension of time is required, which has not otherwise been requested, please consider this a petition therefore and charge any additional fees that may be required to Deposit Account No. 23-3178.

Dated this 5th day of June 2023.

Respectfully submitted,

/Levi S. Brown/

LEVI S. BROWN
Registration No. 72,533
WORKMAN NYDEGGER
Attorney for Applicant
Customer No. 22913

LSB:jme

CERTIFICATE OF SERVICE

I certify that a copy of the foregoing RESPONSE TO FINAL ACTION IN EX PARTE REEXAMINATION has been served by First Class U.S. Mailed on the Third-Party Requester as provided in 37 CFR 1.33(c). The name and address of the party's representative and the date of mailing are:

Andrew R. Sommer
Counsel for Requester
Greenberg Traurig, LLP
1750 Tysons Boulevard
McLean, VA 22102
Tel: 703-749-1370

Dated this 5th day of June 2023.

Respectfully submitted,

/Levi S. Brown/

Levi S. Brown
Registration No. 72,533

Electronic Acknowledgement Receipt	
EFS ID:	48101369
Application Number:	90015063
International Application Number:	
Confirmation Number:	8395
Title of Invention:	DEVICE CAPABILITY BASED DISCOVERY PACKAGING AND PROVISIONING OF CONTENT FOR WIRELESS MOBILE DEVICES
First Named Inventor/Applicant Name:	7233790
Customer Number:	22913
Filer:	Levi S. Brown/JENNIFER ESCAMILLA
Filer Authorized By:	Levi S. Brown
Attorney Docket Number:	22104.12R
Receipt Date:	05-JUN-2023
Filing Date:	23-JUN-2022
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Application Type:	Reexam (Third Party)

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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		22104-12R-2023-06-05-Amendment-B-with-Proof-of-Service.pdf	169223 5982ceb652e4bafe7d2509a98c3fe46f7ca60ed0	yes	15

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Response After Final Action	1	1
	Claims	2	9
	Applicant Arguments/Remarks Made in an Amendment	10	14
	Reexam Certificate of Service	15	15
Warnings:			
Information:			
	Total Files Size (in bytes):	169223	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.
National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.
New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

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BIB DATA SHEET

CONFIRMATION NO. 8395

SERIAL NUMBER	FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
90/015,063	06/23/2022 RULE	455	3992	22104.12R

APPLICANTS
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INVENTORS
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VIDEOLABS INC. (PATENT OWNER), SAN CARLOS, CA;
UNIFIED PATENTS, LLC (3RD PTY. REQ), CHEVY CHASE, MD;

**** CONTINUING DATA ***************************
This application is a REX of 10/600,746 06/19/2003 PAT 7233790
*which claims benefit of 60/393,024 06/28/2002
and claims benefit of 60/392,383 06/28/2002
and claims benefit of 60/393,041 06/28/2002
and claims benefit of 60/392,999 06/28/2002

**** FOREIGN APPLICATIONS ***************************

**** IF REQUIRED, FOREIGN FILING LICENSE GRANTED ****

Foreign Priority claimed ☐ Yes ☑ No		STATE OR COUNTRY	SHEETS DRAWINGS	TOTAL CLAIMS	INDEPENDENT CLAIMS
35 USC 119(a-d) conditions met ☐ Yes ☑ No	☐ Met after Allowance			14	4
Verified and Acknowledged /MATTHEW E HENEGHAN/ Examiner's Signature	Initials				

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Salt Lake City, UT 84111
UNITED STATES

TITLE
DEVICE CAPABILITY BASED DISCOVERY PACKAGING AND PROVISIONING OF CONTENT FOR WIRELESS MOBILE DEVICES

FILING FEE RECEIVED	FEES: Authority has been given in Paper	
0.00	No._____ to charge/credit DEPOSIT ACCOUNT No._____ for following:	☐ All Fees ☐ 1.16 Fees (Filing) ☐ 1.17 Fees (Processing Ext. of time) ☐ 1.18 Fees (Issue) ☐ Other _____ ☐ Credit

BIB (Rev. 05/07).

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
90/015,063	06/23/2022	7233790	22104.12R	8395

22913 7590 06/20/2023

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EXAMINER	
HENEGHAN, MATTHEW E	

ART UNIT	PAPER NUMBER
3992	

MAIL DATE	DELIVERY MODE
06/20/2023	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

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EX PARTE REEXAMINATION COMMUNICATION TRANSMITTAL FORM

REEXAMINATION CONTROL NO. *90/015,063* .

PATENT UNDER REEXAMINATION *7233790* .

ART UNIT *3992* .

Enclosed is a copy of the latest communication from the United States Patent and Trademark Office in the above identified *ex parte* reexamination proceeding (37 CFR 1.550(f)).

Where this copy is supplied after the reply by requester, 37 CFR 1.535, or the time for filing a reply has passed, no submission on behalf of the *ex parte* reexamination requester will be acknowledged or considered (37 CFR 1.550(g)).

PTOL-465 (Rev.07-04)

Notice of Intent to Issue Ex Parte Reexamination Certificate	**Control No.** 90/015,063	**Patent Under Reexamination** 7233790	
	Examiner MATTHEW E HENEGHAN	**Art Unit** 3992	**AIA Status** No

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

1. ☑ Prosecution on the merits is (or remains) closed in this *ex parte* reexamination proceeding. This proceeding is subject to reopening at the initiative of the Office or upon petition. *Cf.* 37 CFR 1.313(a). A Certificate will be issued in view of
   (a) ☑ Patent owner's communication(s) filed: 05 June 2023.
   (b) ☐ Patent owner's failure to file an appropriate timely response to the Office action mailed: _____.
   (c) ☐ Patent owner's failure to timely file an Appeal Brief (37 CFR 41.31).
   (d) ☐ The decision on appeal by the ☐ Board of Patent Appeals and Interferences ☐ Court dated _____
   (e) ☐ Other: _____.
2. The Reexamination Certificate will indicate the following:
   (a) Change in the Specification: ☐ Yes ☑ No
   (b) Change in the Drawing(s): ☐ Yes ☑ No
   (c) Status of the Claim(s):
      (1) Patent claim(s) confirmed: 2,4 and 9.
      (2) Patent claim(s) amended (including dependent on amended claim(s)): 1 and 8
      (3) Patent claim(s) canceled: _____.
      (4) Newly presented claim(s) patentable: _____.
      (5) Newly presented canceled claims: _____.
      (6) Patent claim(s) ☐ previously ☐ currently disclaimed: _____
      (7) Patent claim(s) not subject to reexamination: 3,5-7 and 10-14.
3. ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.
4. ☑ Note the attached statement of reasons for patentability and/or confirmation. Any comments considered necessary by patent owner regarding reasons for patentability and/or confirmation must be submitted promptly to avoid processing delays. Such submission(s) should be labeled: "Comments On Statement of Reasons for Patentability and/or Confirmation."
5. ☐ Note attached NOTICE OF REFERENCES CITED (PTO-892).
6. ☑ Note attached LIST OF REFERENCES CITED (PTO/SB/08 or PTO/SB/08 substitute).
7. ☐ The drawing correction request filed on _____ is: ☐approved ☐disapproved.
8. ☐ Acknowledgment is made of the priority claim under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☐ All b) ☐ Some* c) ☐None of the certified copies have
   ☐been received.
   ☐not been received.
   ☐been filed in Application No. _____.
   ☐been filed in reexamination Control No. _____.
   ☐been received by the International Bureau in PCT Application No. _____.
   * Certified copies not received: _____.
9. ☐ Note attached Examiner's Amendment.
10. ☐ Note attached Interview Summary (PTO-474).
11. ☐ Other: _____.

All correspondence relating to this reexamination proceeding should be directed to the **Central Reexamination Unit** at the mail, FAX, or hand-carry addresses given at the end of this Office action.

	/MATTHEW E HENEGHAN/ Primary Examiner, Art Unit 3992

cc: Requester (if third party requester)

NOTICE OF INTENT TO REISSUE A REEXAMINATION CERTIFICATE

Notice of Pre-AIA or AIA Status

The present application is being examined under the pre-AIA first to invent provisions.

Ex Parte Reexamination

A third party, Unified Patents, LLC, has requested *ex parte* reexamination of claims 1, 2, 4, 8, and 9 of U.S. Patent No. 7,233,790.

A substantial new question of patentability affecting claims 1, 2, 4, 8, and 9 of United States Patent Number 7,233,790 is raised by the request for *ex parte* reexamination. See Order Granting *Ex Parte* Reexamination, mailed 17 August 2022.

The patent owner is reminded of the continuing responsibility under 37 CFR 1.565(a) to apprise the Office of any litigation activity, or other prior or concurrent proceeding, involving Patent No. 7,233,790 (hereinafter the '790 patent) throughout the course of this reexamination proceeding. The third party requester is also reminded of the ability to similarly apprise the Office of any such activity or proceeding throughout the course of this reexamination proceeding. See MPEP §§ 2207, 2282 and 2286.

Extensions of time under 37 CFR 1.136(a) will not be permitted in these proceedings because the provisions of 37 CFR 1.136 apply only to "an applicant" and not to parties in a reexamination proceeding. Additionally, 35 U.S.C. 305 requires that *ex parte* reexamination proceedings "will be conducted with special dispatch" (37 CFR 1.550(a)). Extensions of time in *ex parte* reexamination proceedings are provided for in 37 CFR 1.550(c).

In response to the previous office action, claims 1 and 8 have been amended. Claims 1, 2, 4, 8, and 9 have been examined.

References

The following references have been supplied by the third party requester for proposed grounds of rejection:

U.S. Patent Application Publication No. 2002/0078178 to Senoh (hereinafter (Senoh)

U.S. Patent No. 6,035339 to Agraharam et al. (hereinafter Agraharam)

U.S. Patent No. 6,421,726 to Kenner et al. (hereinafter Kenner)

U.S. Patent No. 6,345,279 to Li et al. (hereinafter Li)

Information Disclosure Statement

The information disclosure statement (IDS) submitted on 13 April 2023 was filed after the mailing date of the final rejection on 10 April 2023. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner to the extent that the pertinence of the references therein has been explained by the Patent Owner.

Allowable Subject Matter

Claims 2, 4, and 9 are confirmed.

Claims 1 and 8 are patentable as amended.

The following is a statement of reasons for the indication of confirmed subject matter:

Regarding claims 1, 2, 8, and 9, the only primary reference considered, Senoh, explicitly teaches away from "selecting a portion of the product catalog to be presented to the subscriber, based on device capabilities of the wireless device used by the subscriber; and presenting the selected portion of the product catalog to the subscriber via a wireless network, such that the selected portion, as presented to the subscriber, provides only a single description of each item of digital content in said portion, regardless of the number of implementations of each said item," as recited in claims 2

and 9. Senoh specifically states that it is an objective to enable a viewer terminal to enjoy content in the format of a display device that is different from the specifications of the user terminal (see paragraphs 8 and 15). Neither Kenner nor Li have been presented in such a way that one skilled in the art would be motivated to modify Senoh in a manner that would completely teach to the claimed inventions, as they would remove this critical functionality from Senoh's invention.

Claim 4 is confirmed based upon its dependence upon base claim 2.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MATTHEW E HENEGHAN whose telephone number is (571)272-3834. The examiner can normally be reached M-F 8-5.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at http://www.uspto.gov/interviewpractice.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Fuelling can be reached on (571)270-1367. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of published or unpublished applications may be obtained from Patent Center. Unpublished application information in Patent Center is

available to registered users. To file and manage patent submissions in Patent Center, visit: https://patentcenter.uspto.gov. Visit https://www.uspto.gov/patents/apply/patent-center for more information about Patent Center and https://www.uspto.gov/patents/docx for information about filing in DOCX format. For additional questions, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/MATTHEW E HENEGHAN/
Primary Examiner, Art Unit 3992

Conferees:

/DEANDRA M HUGHES/
Reexamination Specialist, Art Unit 3992

/MICHAEL FUELLING/
Supervisory Patent Examiner, Art Unit 3992

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	90/015,063	7233790
	Examiner	Art Unit
	MATTHEW E HENEGHAN	3992

CPC						
Symbol					Type	Version
G06Q	/	20	/	123	F	2013-01-01
H04L	/	9	/	40	I	2022-05-01
G06Q	/	20	/	322	I	2013-01-01
G06Q	/	20	/	1235	I	2013-01-01
H04L	/	67	/	564	I	2022-05-01
H04L	/	67	/	04	I	2013-01-01
G06F	/	16	/	9577	I	2019-01-01
H04L	/	63	/	104	I	2013-01-01
H04M	/	3	/	42178	I	2013-01-01
H04L	/	67	/	568	I	2022-05-01
H04W	/	28	/	06	I	2013-01-01
G06Q	/	20	/	12	I	2013-01-01
H04L	/	67	/	303	I	2013-01-01
H04W	/	8	/	245	A	2013-01-01
H04L	/	69	/	329	A	2013-01-01
H04L	/	2463	/	102	A	2013-01-01

CPC Combination Sets							
Symbol					Type	Set	Ranking	Version
	/		/					

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	14	
/MATTHEW E HENEGHAN/ Primary Examiner, Art Unit 3992	06 June 2023	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	1

U.S. Patent and Trademark Office — Part of Paper No.: 20230524

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	90/015,063	7233790
	Examiner	Art Unit
	MATTHEW E HENEGHAN	3992

INTERNATIONAL CLASSIFICATION				
CLAIMED				
H04M	/	3	/	00
G06Q20/12	/	20	/	12
H04L9/40	/	9	/	40
H04L67/564	/	67	/	564
H04L67/04	/	67	/	04
H04W28/06	/	28	/	06
H04L67/303	/	67	/	303

NON-CLAIMED				
H04L69/329	/	69	/	329

US ORIGINAL CLASSIFICATION	
CLASS	SUBCLASS
455	419

CROSS REFERENCES(S)						
CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)					
455	414.1	418				
707	E17.121					

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	14	
/MATTHEW E HENEGHAN/ Primary Examiner, Art Unit 3992	06 June 2023	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	1

U.S. Patent and Trademark Office — Part of Paper No.: 20230524

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	90/015,063	7233790
	Examiner	Art Unit
	MATTHEW E HENEGHAN	3992

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

CLAIMS

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	14	
/MATTHEW E HENEGHAN/ Primary Examiner, Art Unit 3992	06 June 2023	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	1

U.S. Patent and Trademark Office Part of Paper No.: 20230524

Reexamination	Application/Control No.	Applicant(s)/Patent Under Reexamination
	90/015,063	7233790
	Certificate Date	Certificate Number
		C1

Requester Correspondence Address: ☐ **Patent Owner** ☑ **Third Party**

GREENBERG TRAURIG
500 CAMPUS DRIVE
SUITE 400
FLORHAM PARK, NJ 07932

LITIGATION REVIEW ☑	/MH/ (examiner initials)	06 June 2023 (date)
Case Name		Director Initials
1:21cv1448, 1:22cv229 (OPEN)		
3:12cv505, 3:13cv4134, 4:13cv4134 (CLOSED)		
15-1795, 15-1725 (CAFC, CLOSED)		
Starz Ent., LLC v. VideoLabs, 21-1448-JLH (OPEN)		
VideoLabs, Inc. v. Netflix Inc., 22-229-JHS (OPEN)		

COPENDING OFFICE PROCEEDINGS	
TYPE OF PROCEEDING	**NUMBER**
Inter Partes Review	IPR2023-00628

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	90/015,063	7233790
	Examiner	Art Unit
	MATTHEW E HENEGHAN	3992

CPC - Searched*		
Symbol	Date	Examiner

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

Search Notes		
Search Notes	Date	Examiner
Review of Prosecution History	08/10/2022	/MH/
P-TACTS review of AIA proceedings	01/27/2023	/MH/
PDP (patent Data Portal) for continuity data	01/27/2023	/MH/
P-TACTS update review	05/24/2023	/MH/
Global Dossier Search	05/24/2023	/MH/
Review for NIRC	06/06/2023	/MH/

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner

Bibliographic Data

Application No: 90/015,063

Foreign Priority claimed: ○ Yes ◉ No

35 USC 119 (a-d) conditions met: ☐ Yes ☑ No ☐ Met After Allowance

Verified and Acknowledged: /MATTHEW E HENEGHAN/ (Examiner's Signature) | (Initials)

Title: DEVICE CAPABILITY BASED DISCOVERY PACKAGING AND PROVISIONING OF CONTENT FOR WIRELESS MOBILE DEVICES

FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
06/23/2022	455	3992	22104.12R
RULE			

APPLICANTS

VIDEOLABS, INC., SAN CARLOS,, CA, UNITED STATES

INVENTORS

7233790,

VIDEOLABS INC. (PATENT OWNER), SAN CARLOS, CA, UNITED STATES

UNIFIED PATENTS, LLC (3RD PTY. REQ), CHEVY CHASE, MD, UNITED STATES

CONTINUING DATA

This application is a REX of 10600746 06/19/2003 PAT 7233790

10600746 has PRO of 60393041 06/28/2002

10600746 has PRO of 60392383 06/28/2002

10600746 has PRO of 60393024 06/28/2002

10600746 has PRO of 60392999 06/28/2002 *

(*) Data provided by applicant is not consistent with PTO record

FOREIGN APPLICATIONS

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Workman Nydegger
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UNITED STATES

FILING FEE RECEIVED

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$12600

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (01-22)
Approved for use through 05/31/2024. OMB 0651-0031
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT
(Not for submission under 37 CFR 1.99)

Application Number	90015063
Filing Date	2022-06-23
First Named Inventor	7233790
Art Unit	3992
Examiner Name	HENEGHAN, MATTHEW E
Attorney Docket Number	22104.12R

U.S.PATENTS						
Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	5694546	A	1997-12-02	REISMAN RICHARD R.	
	2	6052367	A	2000-04-18	BOWATER et al.	
	3	6076059	A	2000-06-13	GLICKMAN et al.	
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	7	6223291	B1	2001-04-24	PUHL et al.	
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ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /M.E.H/

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	Attorney Docket Number	22104.12R

	9	6324578	B1	2001-11-27	COX et al.	
	10	6430174	B1	2002-08-06	JENNINGS et al.	
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	12	6496979	B1	2002-12-17	CHEN et al.	
	13	6591288	B1	2003-07-08	EDWARDS et al.	
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ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /M.E.H/

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	20	7072861	B1	2006-07-04	YAMANAKA et al.	
	21	7103906	B1	2006-09-05	KATZ et al.	
	22	7200777	B1	2007-04-03	Bouchee Dick G.	
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ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /M.E.H/

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	31	7774799	B1	2010-08-10	SELLERS et al.	
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ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /M.E.H/

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	First Named Inventor	7233790
	Art Unit	3992
	Examiner Name	HENEGHAN, MATTHEW E
	Attorney Docket Number	22104.12R

	42	9832304	B2	2017-11-28	MIKKELSEN et al.	
	43	10007727	B2	2018-06-26	SMITH et al.	
	44	10372811	B2	2019-08-06	RASHID et al.	
	45	11037108	B2	2021-06-15	MAMDANI et al.	
	46	6345279	B1	2022-02-05	LI et al.	

If you wish to add additional U.S. Patent citation information please click the Add button.

U.S.PATENT APPLICATION PUBLICATIONS

Examiner Initial*	Cite No	Publication Number	Kind Code1	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20010047349	A1	2001-11-29	EASTY et al.	
	2	20020091568	A1	2002-07-11	KRAFT et al.	
	3	20020131404	A1	2002-09-19	MEHTA et al.	
	4	20030014436	A1	2003-01-16	SPENCER et al.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /M.E.H/

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	Attorney Docket Number	22104.12R

	5	20030014496	A1	2003-01-16	SPENCER et al.	
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	14	20050188400	A1	2005-08-25	Topel Drew	
	15	20080301231	A1	2008-12-04	MEHTA et al.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /M.E.H/

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	Examiner Name	HENEGHAN, MATTHEW E
	Attorney Docket Number	22104.12R

	16	20100022270	A1	2010-01-28	MIKKELSEN et al.	
	17	20210219021	A1	2021-07-15	O'Neil Joseph Thomas	

If you wish to add additional U.S. Published Application citation information please click the Add button.

FOREIGN PATENT DOCUMENTS

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2]	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1	03-122712	JP	A	1991-05-24	NEC CORP	English Abstract Submitted	☐
	2	2001-175757	JP	A	2001-06-29	MITSUBISHI ELECTRIC CORP	Corresponds to US 7072861 B1	☐
	3	10-0741385	KR	B1	2007-07-20	NOKIA CORPORATION	Corresponds to US 20040248561 A1	☐
	4	01/27783	WO	A1	2001-04-19	SIRENIC INC		☐

If you wish to add additional Foreign Patent Document citation information please click the Add button

NON-PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1	"Enabling business over the mobile Internet," Ellipus Systems, Retrieved from https://web.archive.org/web/20010418183114/http://www.ellipsus.com:80/, Retrieved on Apr 07, 2023, Page 1.	☐

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /M.E.H/

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	First Named Inventor	7233790
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	Examiner Name	HENEGHAN, MATTHEW E
	Attorney Docket Number	22104.12R

	2	"infiniteMAP Feature Specification Content Analysis Manager," Ellipsus Systems, Version 1.0, 2002, Pages 56.	☐
	3	"infiniteMAP Feature Specification Device Capability Manager," Ellipsus Systems, Version 1.1, 2001, Pages 24.	☐
	4	"infiniteMass Ellipsus mobile application server suite 1.1," ellipsus systems, Jan 21, 2002, Pages 2.	☐
	5	"Mobile Applications with J2ME™ A White Paper," ERICSSON, July 2001, Pages 26.	☐
	6	Netflix Inc Vs. Videolabs Inc, Petition for Inter Partes Review, IPR2023-00628, US Patent No. 7,233,790, Feb 22, 2023, pages 86.	☐
	7	ROSENBLUM. M. et al., "The Design and Implementation of a Log-Structured File System," Proceedings of the 13th ACM Symposium on Operating Systems Principle, July 24, 1991, Pages 15.	☐
	8	SATISHKUMAR. R., "A STUDY OF SYNCHRONIZATION MECHANISMS IN UNIX, WINDOWS NT, AND MAC OS," Oklahoma State University, Dec 1997, Pages 87.	☐
	9	U.S. Provisional Patent Application No. 60/392,383 filed June 28, 2002	☐
	10	U.S. Provisional Patent Application No. 60/392,999 filed June 28, 2002	☐
	11	U.S. Provisional Patent Application No. 60/393,024 filed June 28, 2002	☐
	12	U.S. Provisional Patent Application No. 60/393,041 filed June 28, 2002	☐

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /M.E.H/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
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	First Named Inventor	7233790
	Art Unit	3992
	Examiner Name	HENEGHAN, MATTHEW E
	Attorney Docket Number	22104.12R

If you wish to add additional non-patent literature document citation information please click the Add button

EXAMINER SIGNATURE

Examiner Signature	/MATTHEW E HENEGHAN/	Date Considered	05/19/2023

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

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
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	First Named Inventor	7233790
	Art Unit	3992
	Examiner Name	HENEGHAN, MATTHEW E
	Attorney Docket Number	22104.12R

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Levi S. Brown/	Date (YYYY-MM-DD)	2023-04-13
Name/Print	Levi S. Brown	Registration Number	72533

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

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OK TO ENTER: /M.E.H/

06/06/2023

LEVI S. BROWN
OFFICE DIRECT: 801-321-8823
EMAIL: lbrown@WNLAW.COM

FILED ELECTRONICALLY

PATENT APPLICATION
Docket No. 22104.12R

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:	US 7,233,790	)
		)
Serial No.:	90/015,063	) Art Unit
		) 3992
Filed:	June 23, 2022	)
		)
Conf. No.:	8395	)
		)
For:	DEVICE CAPABILITY BASED DISCOVERY PACKAGING AND PROVISIONING OF CONTENT FOR WIRELESS MOBILE DEVICES	)
		)
Examiner:	Matthew E. Heneghan	)
		)
Customer No.:	22913	)

AMENDMENT "B" AND RESPONSE
AFTER FINAL OFFICE ACTION IN EX PARTE REEXAMINATION
(AMENDMENT PLACES CLAIMS IN CONDITION FOR ALLOWANCE)

Mail Stop AF
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

The pending application is subject to an *ex parte* Reexamination. In response to a Final Office Action, which was mailed on April 10, 2023, and in response to a Notice of Defective Paper, which was mailed on May 31, 2023, please amend the above-identified application as follows:

Amendments to the Claims are reflected in the listing of claims which begins on page 2 of this paper.

Remarks/Arguments begin on page 10 of this paper.

Certificate of Service is provided on page 15 of this paper.

FILED ELECTRONICALLY

PATENT APPLICATION
Docket No: 22104.12R

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:	7233790	)	
		)	
Serial No:	90/015,063	)	
		)	
Confirmation No.:	8395	)	Art Unit
		)	3992
Filed:	June 23, 2022	)	
		)	
For:	DEVICE CAPABILITY BASED DISCOVERY PACKAGING AND PROVISIONING OF CONTENT FOR WIRELESS MOBILE DEVICES	)	
		)	
Examiner:	Matthew E. Heneghan	)	

Comments on Statement of Reasons for Allowance

Applicant respectfully submits that the claimed invention as set forth in each of the independent claims and the dependent claims must be read as a whole, and not as a single feature or subcombination of features which represent less than the entirety of the claimed invention as a whole. While a particular feature or subcombination of features referred to by the Examiner in the Statement of Reasons for Allowance may represent a basis for distinguishing the claimed invention over the prior art, Applicant further submits that this may not necessarily be the *sole* ground for distinguishing the claimed invention over the prior art of record. Accordingly, the Examiner's statement should, in Applicant's view, not be read as constituting or meaning that the invention can or should be reduced to a single "feature" of the invention or to a subcombination of features that is less than the entire invention claimed as a whole, nor that the single feature referenced by the Examiner or subcombination of features referenced by the Examiner in the Statement of Reasons for Allowance is the only or sole grounds for distinguishing the invention over the prior art of record, or that applicants necessarily agree with any characterization of the prior art set forth in the Statement of Reasons for Allowance.

Applicant also submits that the phrase "content consuming devices" can be properly viewed as being a replacement for the phrase "wireless communication devices." Applicant's patent specification states that "the techniques described herein need not be limited to wireless services subscribers or mobile client devices." Applicant submits that the prior art of record is not solely distinguishable on the lone basis of wireless communication devices.

Dated this 30th day of June 2023

Respectfully submitted,

/Levi S. Brown/

Levi S. Brown
Attorney for Applicant
Registration No. 72,533
Customer No. 22913

LSB:jme

Electronic Acknowledgement Receipt

EFS ID:	48232724
Application Number:	90015063
International Application Number:	
Confirmation Number:	8395
Title of Invention:	DEVICE CAPABILITY BASED DISCOVERY PACKAGING AND PROVISIONING OF CONTENT FOR WIRELESS MOBILE DEVICES
First Named Inventor/Applicant Name:	7233790
Customer Number:	22913
Filer:	Levi S. Brown/JENNIFER ESCAMILLA
Filer Authorized By:	Levi S. Brown
Attorney Docket Number:	22104.12R
Receipt Date:	30-JUN-2023
Filing Date:	23-JUN-2022
Time Stamp:	10:42:54
Application Type:	Reexam (Third Party)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Miscellaneous Incoming Letter	22104-12R-2023-06-30-Comments-on-Reason-For-Allowance.pdf	86059 cf727c4a010ad41b6c33c7fd7ba79c5053039367	no	2

Warnings:

Information:	
Total Files Size (in bytes):	86059

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.
National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.
New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

US007233790C1

(12) EX PARTE REEXAMINATION CERTIFICATE (12347th)
United States Patent
Kjellberg et al.

(10) Number: US 7,233,790 C1
(45) Certificate Issued: Aug. 11, 2023

(54) **DEVICE CAPABILITY BASED DISCOVERY PACKAGING AND PROVISIONING OF CONTENT FOR WIRELESS MOBILE DEVICES**

(75) Inventors: **Rikard M. Kjellberg**, Santa Cruz, CA (US); **Sheng Liang**, Cupertino, CA (US); **Tomas G. Lund**, Menlo Park, CA (US); **William Chan**, San Mateo, CA (US); **Ramakrishna Chinta**, Sunnyvale, CA (US); **Xinbi Chen**, Palo Alto, CA (US)

(73) Assignee: **VIDEOLABS, INC.**, San Carlos, CA (US)

Reexamination Request:
No. 90/015,063, Jun. 23, 2022

Reexamination Certificate for:

Patent No.:	**7,233,790**
Issued:	**Jun. 19, 2007**
Appl. No.:	**10/600,746**
Filed:	**Jun. 19, 2003**

Related U.S. Application Data

(60) Provisional application No. 60/393,041, filed on Jun. 28, 2002, provisional application No. 60/392,383, (Continued)

(51) **Int. Cl.**

H04M 3/00	(2006.01)
G06Q 20/12	(2012.01)
H04L 9/40	(2022.01)
H04L 67/564	(2022.01)
H04L 67/04	(2022.01)
H04W 28/06	(2009.01)
H04L 67/303	(2022.01)
G06Q 20/32	(2012.01)
G06F 16/957	(2019.01)
H04M 3/42	(2006.01)
H04L 67/568	(2022.01)
H04L 69/329	(2022.01)
H04W 8/24	(2009.01)

(52) **U.S. Cl.**
CPC ***G06Q 20/123*** (2013.01); ***G06F 16/9577*** (2019.01); ***G06Q 20/12*** (2013.01); ***G06Q 20/1235*** (2013.01); ***G06Q 20/322*** (2013.01); ***H04L 9/40*** (2022.05); ***H04L 63/104*** (2013.01); ***H04L 67/04*** (2013.01); ***H04L 67/303*** (2013.01); ***H04L 67/564*** (2022.05); ***H04L 67/568*** (2022.05); ***H04M 3/42178*** (2013.01); ***H04W 28/06*** (2013.01); *H04L 69/329* (2013.01); *H04L 2463/102* (2013.01); *H04W 8/245* (2013.01)

(58) **Field of Classification Search**
None
See application file for complete search history.

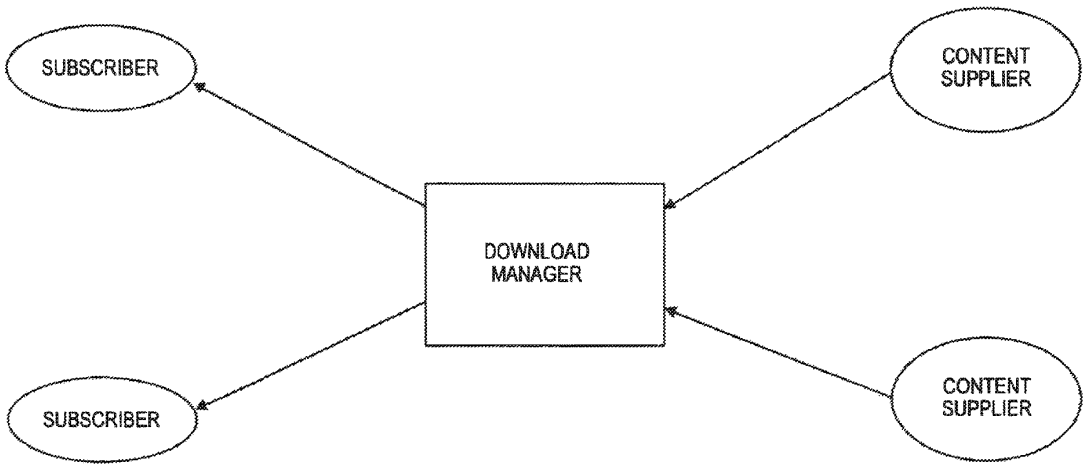
(56) **References Cited**

To view the complete listing of prior art documents cited during the proceeding for Reexamination Control Number 90/015,063, please refer to the USPTO's Patent Electronic System.

Primary Examiner — Matthew E Heneghan

(57) **ABSTRACT**

A network server system includes a download manager that manages the publication, purchase and delivery of digital products from multiple suppliers to wireless services subscribers in multiple domains. Product suppliers can publish and manage their products on the server system via a computer network and make their products available to the subscribers for purchase or licensing. The subscribers in each domain can access the server remotely to purchase rights to download and use the products on associated wireless communication devices. Multiple different implementations of any product can be maintained, where each implementation corresponds to a different set of device capabilities. Each product can also be associated with multiple different provisioning models, each corresponding to a different set of device capabilities.



Related U.S. Application Data

filed on Jun. 28, 2002, provisional application No. 60/393,024, filed on Jun. 28, 2002, provisional application No. 60/392,999, filed on Jun. 28, 2002.

EX PARTE REEXAMINATION CERTIFICATE

THE PATENT IS HEREBY AMENDED AS INDICATED BELOW.

Matter enclosed in heavy brackets [ ] appeared in the patent, but has been deleted and is no longer a part of the patent; matter printed in italics indicates additions made to the patent.

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **2**, **4** and **9** is confirmed.

Claims **1** and **8** are determined to be patentable as amended.

Claims **3**, **5-7** and **10-14** were not reexamined.

1. A method of providing access to *digital* content for use on wireless communication devices, the method comprising:

receiving and storing *in a server system* a plurality of items of *digital* content to be made available for use in wireless communication devices used by a plurality of wireless services subscribers, including receiving *and storing* a plurality of different implementations of at least one of the items of *digital* content, where each implementation of any given item of *digital* content corresponds to a different set of device capabilities; **[**and**]**

[maintaining**]** *operating the server system to maintain* a product catalog containing a description of the items of *digital* content, *wherein* the product catalog **[**including**]** *includes*, in association with each item of *digital* content, a reference to each implementation of said item of *digital* content**[**.**]**;

receiving a request from one of the wireless communication devices;

in response to the request, selecting a portion of the product catalog to be presented on the one wireless communication device, based in part on device capabilities of the one wireless communication device; and

presenting the selected portion of the product catalog to the one wireless communication device, such that the selected portion, as presented, provides a single description of each item of digital content in said portion, regardless of a number of implementations that are available for each said item.

8. A system *that provides access to digital content for use on wireless communication devices, said system* comprising:

a network interface through which to communicate over a communication network; and

a download manager to*:*

receive and store a plurality of items of *digital* content to be made available for use in wireless communication devices used by a plurality of wireless telecommunications subscribers, including receiving *and storing* a plurality of different implementations of at least one of the items of *digital* content, where each implementation of any given item of *digital* content corresponds to a different set of device capabilities; **[**and**]**

maintain a product catalog containing a description of the items of *digital* content, *wherein* the product catalog **[**including**]** *includes*, in association with each item of *digital* content, a reference to each implementation of said item of *digital* content**[**.**]***;*

receive a request from one of the wireless communication devices;

in response to the request, select a portion of the product catalog to be presented on the one wireless communication device, based in part on device capabilities of the one wireless communication device; and

present the selected portion of the product catalog to the one wireless communication device, such that the selected portion, as presented, provides a single description of each item of digital content in said portion, regardless of a number of implementations that are available for each said item.

* * * * *

UNITED STATES
PATENT AND TRADEMARK OFFICE

P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

ACKNOWLEDGEMENT OF CHANGE TO SMALL ENTITY STATUS

APPLICATION #	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET #	REQUEST ID
90/015,063	06/23/2022	7233790	22104.12R	112076

The entity status change request below filed through Patent Center on 09/26/2023 has been accepted.

Certifications

APPLICANT ASSERTING SMALL ENTITY STATUS. See 37CFR 1.27.

Signature

I certify, in accordance with 37 CFR 1.4(d)(4), that I am one of the signatories making the entity status change.

Signature	Name	Registration #
/Levi Brown/	Levi Brown	72533

UNITED STATES
PATENT AND TRADEMARK OFFICE

P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

ACKNOWLEDGEMENT OF LOSS OF ENTITLEMENT TO ENTITY STATUS DISCOUNT

APPLICATION #	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET #	REQUEST ID
90/015,063	06/23/2022	7233790	22104.12R	125134

The entity status change request below filed through Patent Center on 11/09/2023 has been accepted.

Certifications

APPLICANT CHANGING TO REGULAR UNDISCOUNTED FEE STATUS

Signature

I certify, in accordance with 37 CFR 1.4(d)(4), that I am one of the signatories making the entity status change.

Signature	Name	Registration #
/Levi Brown/	Levi Brown	72533