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

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
15 October 2009 (15.10.2009)

PCT

(10) International Publication Number
WO 2009/124337 A1

(51) International Patent Classification:
G06F 3/048 (2006.01) *G06F 17/30* (2006.01)

(21) International Application Number:
PCT/AU2009/000419

(22) International Filing Date:
8 April 2009 (08.04.2009)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
2008901760 11 April 2008 (11.04.2008) AU
2008100718 4 August 2008 (04.08.2008) AU

(71) Applicant and
(72) Inventor: **STAFFORD, Kieran** [AU/AU]; 1 Place Patent Attorneys + Solicitors, Suite 404, 107 Walker St, North Sydney, New South Wales 2060 (AU).

(74) Agent: **BATES, Michael**; Suite 404, 107 Walker St, North Sydney, New South Wales 2060 (AU).

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

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

Published:

— *with international search report (Art. 21(3))*

(54) Title: MEANS FOR NAVIGATING DATA USING A GRAPHICAL INTERFACE

(57) Abstract: The present invention relates to a means for navigating data and in particular to a computer-implemented graphical means for navigating a collection of data such as a database. The invention provides a means for a user to: a) explore or drill down through a database without needing to enter a text-based keyword search; and b) navigate a database using a graphical interface that presents structured options to users rather than relying on user knowledge to direct the navigation process.

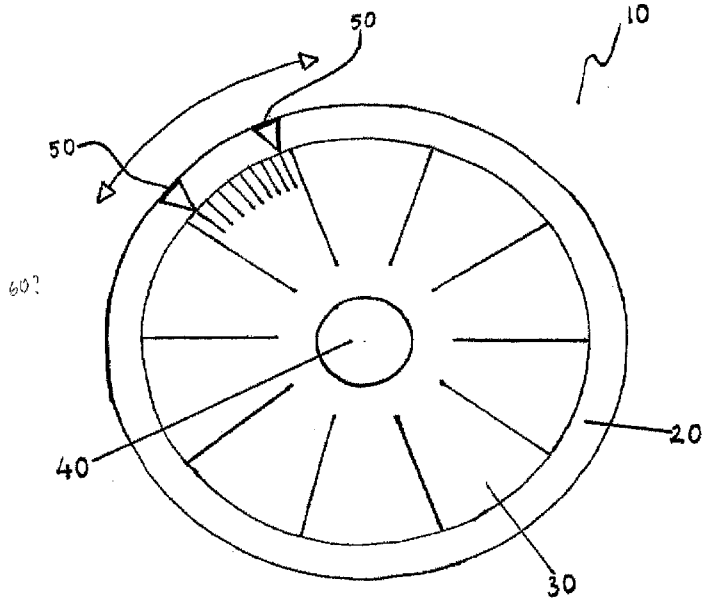

FIGURE 2

WO 2009/124337 A1

MEANS FOR NAVIGATING DATA USING A GRAPHICAL INTERFACE

INTRODUCTION

The present invention relates to a means for navigating data and in particular to a computer-implemented graphical means for navigating a collection of data such as a database. The invention provides a means for a user to:

a) explore or drill down through a database without needing to enter a text-based keyword search; and

b) navigate a database using a graphical interface that presents structured options to users rather than relying on user knowledge to direct the navigation process.

The invention has been developed primarily for use as a new or improved graphical means for exploring a comprehensive hierarchical music library, and has been designed for use by consumers and in business such as by hospitality, retail and other commercial providers where the playing of selected music is desirable. However, it will be appreciated that the invention is not restricted this particular field of use.

PROBLEMS OF THE PRIOR ART

Current means for navigating a collection of data, whether it be a database or any other repository of information, typically require a user to type key word search terms into a search engine. The main problem with this approach is that it relies on user knowledge and on user skill in conducting searches. Therefore, the results of these kinds of searches often suffer the following disadvantages:

(a) if the user has limited knowledge of the subject area, the search may bring up a large number of irrelevant results or fail to find relevant material;

(b) if the search is framed too broadly, the volume of material found may be overwhelmingly large to review;

(c) the effort involved in navigating or drilling down into the data can be significant, so the user's level of satisfaction from the search is often dependent on the amount of time the user is able to dedicate to the task of searching and trawling through the results or exploring new tangents raised by the search results.

Another traditional means for a user to navigate a data collection is to browse the collection. The disadvantages of this method include:

(a) browsing a large data collection can be very time consuming and therefore the ability for users to find what they are looking for can be limited;

(b) it can be difficult to locate relevant material by browsing and to relocate it.

Take, by way of example, a collection of digitised music. Many consumers have built a collection of digital music files. With digital music collections, many consumers do not catalogue or tag their files at all, resulting in potentially vast collections of digital files without the means to sort through them – other than to add files to a favourite playlist, which becomes as unmanageable as the remainder of the collection once it reaches a certain size. In a commercial setting, this is inadequate, particularly if music is an important component of the commercial environment (e.g. in a shop, restaurant or cocktail lounge).

Many consumers are frustrated by the inability to have a large selection of music available at their fingertips, to listen to on demand. Many businesses cannot dedicate the resources to build and catalogue a music collection or spend the time listening to music to determine its appropriateness for inclusion in their collection. Consequently, many business (and individuals) end up having a "safe" but limited collection, or rely on radio or a piped background music service.

OBJECT OF THE INVENTION

It is an object of the present invention to overcome or ameliorate at least one of the disadvantages of the prior art, or to provide a useful alternative. In particular, the present invention provides a new or alternative computer-implemented system, method and apparatus for consumers or business to navigate data without the need to rely solely on key word searching of the data.

According to the invention there is provided a computer-implemented method for navigating a data collection such as a collection of digitised music files including the steps of:

(a) analysing metadata regarding each of a plurality of data files in a data collection;

(b) calculating correlations between said metadata to sort data files such that said data files are sorted into one or more categories based on said correlations between respective metadata;

(c) calculating correlations between said categories to enable ranking of said categories by degree of relative correlation such that a relationship between said categories is defined;

(d) providing a graphical representation of said data collection and of said categories of data files within said data collection such that a viewer is enabled to view at least a part of said data collection;

(e) associating an action involving said graphical representation or a part thereof with a function such that performing said action on said graphical representation or a relevant part thereof results in performing said function on:

i. a corresponding said category;

ii. a corresponding said data file;

iii. any combination of the above,

wherein the method enables:

A. navigation of a data collection by relying on correlations between metadata for each data file in a data collection and correlations between categories of data file; and

B. performing one or more functions on a data collection by performing an action on a graphic representation of the corresponding respective part of the data collection.

According to another aspect of the invention there is provided a computer-implemented appaaratus for navigating a data collection such as a collection of digitised music files including:

(a) means for analysing metadata regarding each of a plurality of data files in a data collection;

(b) means for calculating correlations between said metadata to sort data files such that said data files are sorted into one or more categories based on said correlations between respective metadata;

(c) means for calculating correlations between said categories to enable ranking of said categories by degree of relative correlation such that a relationship between said categories is defined;

(d) a graphical representation of said data collection and of said categories of data files within said data collection such that a viewer is enabled to view at least a part of said data collection;

(e) means for associating an action involving said graphical representation or a part thereof with a function such that performing said action on said

graphical representation or a relevant part thereof results in performing said function on:

i. a corresponding said category;

ii. a corresponding said data file;

iii. any combination of the above,

wherein the apparatus enables:

A. navigation of a data collection using correlations between metadata for each data file in a data collection and correlations between categories of data file; and

B. performing one or more functions on a data collection by performing an action on a graphic representation of the corresponding respective part of the data collection.

BRIEF DESCRIPTION OF THE DRAWINGS

A preferred embodiment of the invention will now be described, by way of example only, with reference to the accompanying drawings in which:

Figure 1 is a schematic representation of a navigation tool in the preferred embodiment, used to navigate a first tier of data in a hierarchical data collection.

Figure 2 is a schematic representation of the navigation tool in Figure 1 adapted to navigate a second tier of data.

Figure 3 is a schematic representation of the navigation tool in Figure 1, adapted to navigate a third tier of data.

Figure 4 is a schematic representation of a graphical navigation tool according to the preferred embodiment illustrated in the preceding Figures. Using this tool, a user is enabled to select options for drilling down into a fourth or subsequent tier of data. However, users are not required to drill down multiple tiers of data in order to use the navigational tool of the preferred embodiment.

DETAILED DESCRIPTION

The following detailed description in conjunction with the figures provides the skilled addressee with an understanding of the invention. It will be appreciated, however, that the invention is not limited to the applications described below.

Summary of the invention

The present invention provides a graphical computer-implemented means for navigating a data collection. The invention provides a navigation tool for exploring a data collection and revealing relationships between data, without relying on key word searching and user knowledge of the data subject area. In this way, the invention is also a new or useful alternative to a catalogue and to a search engine for selecting data from a comprehensive data collection.

In a preferred embodiment also provides a new or alternative system, method and apparatus for consumers or business to access music, including:

(a) a comprehensive music collection;

(b) apparatus for delivering music from the music collection to the user, on demand, including means for creating a music compilation to meet a user's music choices;

(c) a graphical user interface that enables a user to browse the collection and to perform deep searches of the data collection without the need to type in a search term.

Alternative embodiments provide a system, method and apparatus for navigating, say, a collection of wine, cheese, menus, film, sounds, still images, perfumes or any other grouping of objects that can be classified. The invention enables recall or selection of an object from within a collection without the use of keyword searching or prior knowledge of classification (ranking) criteria.

In this document, the term "object" includes:

(a) a sound, for example, a musical piece;

(b) an image, for example, a picture, still image or film clip;

(c) a texture, for example, a gritty surface or a silky finish;

(d) a smell, for example, a perfume or aroma;

(e) a taste, such as a bitter taste or a taste associated with a particular cheese or wine; and/or

(f) a combination of the above;

Advantages of the present invention

The invention is a new or useful alternative to a traditional catalogue and to a traditional search engine, both of which suffer the disadvantage of requiring at least minimal user knowledge of the subject area to get meaningful data out of a comprehensive data collection. Further the present invention presents relationships to a user, which enables the invention to be used as a teaching aid or educational tool.

This is because users do not need to have knowledge of the data subject area to make selections from a comprehensive collection of data – in the preferred embodiment, the invention is applied to a music collection. Alternative embodiments include collections of images (still and moving), collections of artwork, and collections of stories, or any other reference collection. The invention is particularly suited to data that can be categorised into major groups and then sorted according to time. Examples include:

(a) archives of material (including images) for individual events such as the Melbourne Cup, Commonwealth Games, World Cup, Olympics and so on; or

(b) library catalogues.

The invention enables a user's selection to be made by using a navigation tool (e.g. a graphic representation of tool such as a dial, wheel or slider) to:

(a) select a first broad category (tier) of data;

(b) refine the search according to time (a second tier of data);

(c) further narrow the selected data according to pre-determined sub-categories of the first tier of broad category (a third tier of data);

(d) drill more deeply into a data collection by selecting fourth and subsequent tiers of data, if desired.

This confines the number of steps required by a user to make a selection and simplifies the task of performing a search, while still relying on sophisticated querying of the underlying database. It also opens the opportunity for users to explore the database freely (by browsing genres or sub-genres) and to stumble across music that they do not know, without the need to have knowledge of the artist or of a specific track or title.

The invention has been developed primarily for use as a system, method and device for accessing a music collection; however, it should be appreciated by those skilled within the art that the invention is not restricted to this particular field of use. For example, the invention can be applied to any of the arts such as painting, photography, video, film, poetry, books, and other arts (or catalogues of such subject matter) that are able to be communicated over a networked computer or radio broadcast system.

The elements of the invention are now described under the following headings.

An exemplary preferred embodiment: a navigation tool

In a first exemplary preferred embodiment, the invention is a tool for navigating or exploring a digitised music content database. The navigation tool illustrated schematically

in Figure 1 enables a user to select (and browse) a first tier of data. This tier includes broad groups of data. In the music database example, this equates to broad genres of music such as “classical”, “jazz”, “rock”. The user only needs to have very basic knowledge of music styles to enter the database (that is to gain access to the database) and to navigate between these broad categories in a first tier.

Referring to Figure 1, the preferred embodiment provides a series of graphical representations displayed on a computer screen (or other digital display means such as a digital panel), which are enabled to be manipulated by a user. Using the navigation tool depicted in Figure 1, a user is enabled to browse broad groups of data within a data collection. In the preferred embodiment, the data collection is depicted on a computer screen or other display means as a wheel 20 that is segmented into groups of data (labelled 30). The data collection in the preferred embodiment could as easily be depicted using a slider, button, dial or other graphical representation.

A user navigates from one data group 30 to another within the data collection (such as a database) by turning the navigation tool 10 around the wheel 20 in a clockwise or counter-clockwise direction. The user makes a selection by turning the navigational tool 10 until the desired data group 30 meets the selection indicator 50. In this example, each data group 30 is a different genre of music. The user’s choice is locked in by pressing a locking means, such as a button 40 in the centre of the wheel 20, when the desired data group 30 (say the genre “jazz”) is adjacent to the selection indicator 50.

Once the user selects the desired data group 30 (genre) in a first tier of data, the user is then enabled to navigate a second tier of data in the data collection. The graphical representations presented to the user change to reflect the shift from one tier of data to another.

Time selection tool

Referring now to Figure 2, the wheel 20 represents an epoch of time – say, the twentieth century. The user employs similar techniques for making a selection of data in a second tier

as for making a selection of data in a first tier; namely, the user rotates the navigation tool 10 around the wheel 20 until the desired data group is adjacent to a selection indicator 50. The difference now is that two selection indicators 50 are present, enabling a user to select a range of data within a data group 30.

In our music database example, each data group 30 in Figure 2 represents a different time period. The user selects a time period by moving a first selection indicator 50 to a starting point in time and a second selection indicator 50 to a finishing point in time. In the example shown in Figure 2, the years 1951 to 1959 are chosen. At this point, the user has navigated the music database to find "jazz" from the period "1951" to "1959".
The user locks in his or her selection of a time period by pressing the central button 40. This step then enables a user to be presented with a further tier of data.

Narrowing the search

The user is enabled to further narrow the search of the data collection without typing in key words – it is this and deeper levels of searching that are often not available to ordinary consumers with limited knowledge of the subject area.

Referring to Figure 3, the navigation tool 10 is similar to the navigation tool depicted in Figure 1. In Figure 3, however, the wheel 20 represents the genre of music earlier selected by the user. So while "jazz" represented a single segment of the wheel 20 in Figure 1, the entire wheel 20 in Figure 2 now represents the genre "jazz". Each segment 30 is a different microgenre such as "swing", "free", "cool", "dixieland" and so on. The data groups (microgenres) presented to the user are determined by the user's earlier selections. For example, if our user's earlier choices had been "jazz" between "1930 and 1940", the microgenre selection would not include "free" jazz because there was no free jazz in the 1940s.

Deep drilling of the data collection

A user is presented with further navigation tools to drill down more deeply into the data collection; examples of these tools are shown schematically in Figure 4. For example, at the

top of Figure 4 is an "instruments" selection scale 70. The user can use the scale 70 to select between, for example:

(a) solo;

(b) duo;

(c) trio;

(d) quartet +;

(e) big band

Other selection tools illustrated in Figure 4 enable the user to select:

(a) Vocal: "male / female / any" and then "solo", "duet", "group", "choir"

(b) Emotive tone of the music: cool to hot

(c) Speed or tempo of the music: ballad to fast dance.

Users can also make a selection according to the geographical source (location) of the music (not illustrated). The graphical representation of the selection tool in this case might be a map or other icon to represent location.

These further selection tools enable a user to drill deeply and build a detailed nagivation path through a data collection without needing to have specialist knowledge. The tools, as illustrated schematically in the Figures, are graphic elements (termed graphical represenations) that the user can use without needing to type in words or to make selections from long "contents" lists. It will be appreciated by those skilled in the art that the tools are not restricted to the graphical representations illustrated (that is, wheels and scales) but could be represented by any graphical representation that enables a user to browse from one category to another and to lock in multiple selection criteria.

Educational tool

One advantage of the preferred embodiment as described above is that it provides a user with a means for a user to explore a data collection within broad parameters, without overwhelming the user with long lists of choices or requiring the user to type in key words (which requires some knowledge of the subject area).

For example, a key word search for similar music as located by the navigation tool described in the steps above would require a user to type in queries along the following lines:

(a) "free jazz from 1950 to 1959";

(b) "free jazz from the 1950s";

(c) "free jazz and 1950s";

(d) "free jazz and fifties".

Musical novices or young learners are likely to be unaware of "free jazz" and of when it first appeared on the music scene; they are equally unlikely to stumble across this stype of music from this era or, if they did, would be unlikely to be able to date the music back to the correct time period or know where the music fits in the context of various genres of music. In this way, the preferred embodiment is a useful educational tool for exploring musical genres. The significance of the preferred embodiment as an educational tool is perhaps better appreciated with avant garde or alternative genres or narrow microgenres of music, which a user might never otherwise be exposed to if searching using key word searches.

The preferred embodiment provides a means for a user to browse from category to category in at least a first tier of data, and to progressively narrow the data category with each tier of data added to the exploration path. In the music collection example, the user need not have any knowledge of different music styles. In this way, the preferred

embodiment provides an educational tool for a user to explore relationships between data (different styles of music) without the need for any knowledge of the subject area.

Music content database

The present invention also provides consumer access to a comprehensive music collection, which is a collection of digital music files such as a music database. Each file is indexed (tagged, metatagged) in a manner that enables users to:

(a) browse the database or a section of it; and/or

(b) conduct sophisticated searches of the database, if desired (by drilling deep into the data collection using the tools provided).

In the preferred embodiment, the database includes around 25 main genres of music, which are subdivided into a further 700 micro-genres. Each music track is identified by approximately 16 metadata tags, including composer, artist and title. In the preferred embodiment, the navigational tool utilises metadata tags and combination of tags to categorise music tracks and to enable browsing, sorting and selection of music by users.

The data collection is collated from material obtained from the copyright owner or with the copyright owner's authority, eliminating contamination by incomplete or poor quality recordings or tracks. The database is continuously updated, resulting in access to an ever increasing collection of music.

The advantage of providing a music collection in the preferred embodiment is that currently, the majority of ordinary consumers choose music by their acquired musical taste and experience (what they have heard before, artists they know), word of mouth recommendation, music reviews, what they are exposed to through the media (popular music) and simply by asking when they hear music they like (e.g. in a club, at an event or in a music store). This is time consuming and limiting because consumers need to acquire

knowledge in order to broaden their collection of music. For business, it also represents a significant investment of time and other resources.

Many consumers are frustrated by the inability to have a large selection of music available at their fingertips, to listen to on demand. Many businesses cannot dedicate the resources to build and catalogue a music collection or spend the time listening to music to determine its appropriateness for inclusion in their collection. Consequently, many business (and individuals) end up having a "safe" but limited collection, or rely on radio or a piped background music service.

With digital music collections, many consumers do not catalogue or tag their files at all, resulting in potentially vast collections of digital files without the means to sort through them - other than to add files to a favourite playlist, which becomes as unmanageable as the remainder of the collection once it reaches a certain size. In a commercial setting, this is inadequate, particularly if music is an important component of the commercial environment (e.g. in a shop or restaurant).

There is no known product available that simplifies this task for consumers by providing a music content player system that interacts with a digitised music content data collection, including:

(a) a comprehensive music collection;

(b) apparatus for delivering from the music collection to the user, such as through data streaming technology;

(c) a user interface that enables user selection of music according to tiers of data such as genre, timeline, microgenre, instrumental, vocal, emotive then speed or tempo.

Data content delivery means

The data content player means of the present invention delivers the desired data (as selected by the user) from a data collection to the user. In a preferred embodiment, the music content database of the present invention interacts with data streaming technology, to deliver the selected music to the user. The music is delivered to the user using streaming technology, which can be accessed using any protocol that can deliver streamed files over the internet. Music is streamed to overcome the problem of delay that occurs when music is downloaded and to minimise computing resources required to operate the invention.

The user interface of the present invention works across all Internet protocols such as TCP/IP, file transfer means such as FTP, radio transmissions and mobile phone applications, and is not limited to any specific protocol. This enables users to access the invention from a number of locations, and does not limit them to using the invention in one particular location, or to 'carting around' apparatus in order to access their music collection from different locations.

The inventive system and method includes tracking software that tracks a user's individual musical preferences. This enables the system to deliver to the user increased choices that match the user's individual musical taste. Therefore, if the user commonly searches for "cool jazz", the system will actively deliver more titles in this genre to the user than, say, to a user who only listens to "rock" and "1970s".

The present invention has unlimited scalability, enabling it to be used by individuals or by collections of individuals across the globe.

Method for navigating a data collection

The present invention enables a user to select music by genre (or to drill down to select by sub-genre, including by epochs). The user's selections are made through a user interface that enables querying of a comprehensive music database, without relying on sophisticated music knowledge. The inventive system and apparatus deliver music that fits the user's selection criteria. The music is delivered to the user using streaming technology. Therefore, the present invention is not confined to use in a single location.

The preferred embodiment provides a means for a user to select music from a music database, including the steps of:

(a) **selecting a genre**: the user uses the navigation tool of the preferred embodiment (depicted schematically in Figure 1) to select a genre, e.g. Blues, Jazz, Rock, Country, etc. The user selects the genre by rotating the wheel until it reaches the user's selection (in this example, the selected genre is "jazz"). The wheel spins in response to mouse movements or to key input. Once the relevant genre is selected, the view expands (becomes magnified) to enable the user to read the text before locking in the selection.

(b) **selecting a period in time**: the wheel shown in Figure 2 is the timeline selection tool. Once a genre is selected, the wheel represents the time range of tracks in that genre. Years in that range are shown when the wheel is moved. A user rotates the wheel to select an appropriate start date and finish date (e.g. from 1960 to 1969). When the user has selected the desired time range, he or she locks in the selection and a song corresponding to the point chosen in the chronology plays. Users have taken two steps to reach this point: selecting a genre and then selecting a time period (epoch).

(c) **selecting a micro-genre:** the preferred embodiment enables users to select a micro-genre (e.g. "cool jazz") to drill down to a narrower range or more specific style of music. Alternatively, users can select "all" at this point. If they select "all", the preferred embodiment will play a random selection of 1960s jazz. If they select "avant-garde" the preferred embodiment will only play that style of 1960s jazz (assuming that the 1960s is still the selected time period).

The player interacts with the database in a unique way due to the architecture of the database. Users are drawn into a "push-pull" streaming model where they make a limited number of choices in order to access a comprehensive range of self-selecting tracks from the database.

Method for selecting a second or subsequent tier of data

Referring to Figure 3, a genre of music, in this case "jazz", has already been selected using a the navigation tool depicted in Figure 1, as has a time period (say the 1960s). When this is done, a range of micro-genres is presented to the user - for example, as follows:

(a) Cool;
(b) Hard Bop;
(c) Free (default selection);
(d) Vocal;
(e) Soul Jazz
(f) All.

A user can use the dial (or a button, slider or other graphical representation – a dial is used for ease of description and may be substituted for any other graphical representation) to select the desired micro-genre. Again, when the user hones in to make a choice, the text is magnified or expands for ease of use.

The preferred embodiment also includes a graphic representation (e.g. a map) of selection tools for users to further refine the selection of music. Examples include instruments, vocals, emotive "flavour" or speed of the track, as well as geographic origin. For example, users may select music from "Memphis" or "Detroit". Selecting either of these locations for a micro-genre of "soul", for example, at a particular period of time can provide the listener with a very different and uniquely particular feel of, say, soul music.

Track selection display

The artist and title of the track selected (playing) is displayed on the screen. This track selection display can be used to reveal the previous tracks played, sorted by artist name, playing order or some other selection criteria. It can also be used to display tracks scheduled to be played.

In practice, the user may:

(a) have the genre and period of the music pre-selected so they just select the URL of the music content database provider or start the music content player application of the present invention; or

(b) make the selections using the method described above – dial a genre, select a time period, and choose a micro-genre. This results in, for example, the track playing by the artist "Chick Corea" with the track tilted "Song of the Wind", followed by other tracks that meet the user's selection criteria.

Track compilation means

The present invention provides a data compilation means (in this example, a means for automatically compiling a number of musical tracks), which utilises the track metadata to determine the order of tracks in each listening session. Each track has a significant amount of metadata associated with it, including:

(a) information readily available from the record company database, including the name of the artist, track title, composer, and record company; and

(b) additional information such as genre and micro-genre, period of release, location of release, and other details. For example, the same title may be included in the music content database of the preferred embodiment a number of times, each time indexed according to a different date of re-recording, such as 1961, 1962 and 1971, resulting in different music styles within a single sub-genre.

Additional pieces of information indexed against a track (i.e. included in the track metadata) include the style of music, band size (e.g. trio, quartet), where the band hails from (e.g. America, Boston; or Australia, Sydney) and various other pieces of information. This results in a fine grain classification of tracks instead of having, say, the three or so very broad genres of music like jazz, rock and blues. In the preferred embodiment, there are 700 sub-genres and mini genres (divisions of sub-genres) so the user can drill down to each track and find the closest relationship between the track playing and determination of the next track to be played.

In this way, the preferred embodiment provides a system, method and apparatus for like tracks to be linked, using detailed track metadata. The inventive music content player system is set up to play tracks that fall within the criteria chosen by the user. For example, once a user has made the relevant choices (e.g. “jazz” from “1963 to 1963” then “cool jazz”, from “USA”), the preferred embodiment will find all tracks within the music content database that meet these criteria. The track with the closest match of metadata to the current track playing will be played next; however, if there are two or more tracks with an equally close match then the next track chosen will be:

(a) a random selection process, keeping the music flow interesting and unexpected;

(b) automatically sequenced according to metadata and business rules relating to metadata; or

(c) a user's personal preference, guided by previous track play or further fine-tuning by the user of a preferred track order or compilation.

The preferred embodiment provides a means to automatically create a track compilation to meet a user's music choices. The user does not need to select the order of tracks or to arrange tracks in a particular order. The preferred embodiment enables the order of tracks to be randomly allocated, or to be determined according to the degree of match between metadata. This involves a comparison of the metadata for any number of tracks, and a "scoring" of tracks according to a common metadata set. For example, say there are 17 individual metadata associated with any given track that comes up within a user's selection of "jazz" from "1963" then "cool jazz", from "USA". The tracks with the largest number of matching metadata (say, 14 to 16 of the criteria such as genre, time, sub-genre, location and so on) will be given the highest "score". This results in these tracks being given a higher priority for play - in other words, these tracks will be played in close sequence to each other, in descending order of their score.

The scores can be underlined or superimposed with business rules, which determine the priority of identical tracks with the same "score" and also allow for play of, say, one instrumental track followed by two vocals or other similar rulings. When an overall style is selected such as "jazz" and "1960 to 1969" then the preferred embodimens plays everything that fits in such broad criteria except when underlying rules are chosen.
The preferred embodiment also enables a user to build his or her own music compilations, by the user setting the priority of play or determining business rules according to their own listening preferences (e.g. no more than three vocals in a row).

An alternative embodiment of the present invention enables database selections of other art forms such as paintings, photography, video, film, poetry, books, and other arts that are able to be communicated over a networked computer or radio broadcast system.

Means to promote new artists and art forms

The preferred embodiment provides a new or alternative means to promote new artists through the inclusion of new releases in the music content database, such as new jazz tracks that have been pressed in, say, Sydney in the last month. The system interacts with a website or other media to co-promote new tracks to users who want the "gig" live. Promotion of the venue or other advertising is also enabled as shown in Figures 1 and 2 in the caption "branding". Therefore, a micro-genre can be selected by "new release" instead of time.

An embodiment of the invention can deliver music video, including clippage of the artist(s) performing live, independent music video and so on. In this way, the artist is enabled to provide their own visual displays to coincide with the music tracks that they provide, so an artist is not restricted to providing an art form only within the one medium such as music, but may, alternatively provide a music video, for example, for the launch of an album or track.

A data distribution gateway

The preferred embodiment provides a data distribution gateway for data such as music, and is particularly useful for independent or "off-label" recordings. A party, such as an independent record company in Poland, say, can increase its distribution of records through a gateway into the music content database of the present invention. The gateway requires detailed metadata to be provided by the record company with every music track, prior to the music going "live" (that is, being accessible to users) on the database. This is to ensure the integrity of the database and of the system, since the ability to access tracks and to build compilations depends on the quality of the metadata.

In contrast to the retrospective selection of genre, the preferred embodiment also enables current releases of music to be compared with previous genres, to give an indication of

current and future music directions, by location or other criteria. For example, in the early 1970s the punk movement evolved with strong undercurrents to influence music and socionomic direction.

In this way, the preferred embodiment provides a "channel" or medium for any chosen music genre, including, if desired, a new release channel specifically, for example, for Australian jazz, blues or country music. This can be further broken down to locally-based jazz, so the user can select music available tonight in the various venues around Sydney. This promotes momentum to get people to attend and also allows the monitoring of sub-genre activity and momentum in the arena.

In the field of socionomics, music is considered a good indicator of collective social mood. Collective mood changes in the market affect indexes such as share market indexes. The preferred embodiment provides an indicator of market mood because it enables tracking of music trends over time and correlations to be drawn with other indicators, such as share market activity or real property prices. No known music library or other database can perform this function. This is particularly important where world economics is currently changing in the sense that Australia may no longer be linked to the USA and therefore there may be stronger and more divergent music trends evolving. Consequently, the preferred embodiment is a useful data collection, comparison and forecast means.

Although the invention has been described with reference to specific examples, it will be appreciated by those skilled in the art that the invention may be embodied in many different other forms.

1. A computer-implemented method for navigating a data collection such as a collection of digitised music files including the steps of:

   (a) analysing metadata regarding each of a plurality of data files in a data collection;

   (b) calculating correlations between said metadata to sort data files such that said data files are sorted into one or more categories based on said correlations between respective metadata;

   (c) calculating correlations between said categories to enable ranking of said categories by degree of relative correlation such that a relationship between said categories is defined;

   (d) providing a graphical representation of said data collection and of said categories of data files within said data collection such that a viewer is enabled to view at least a part of said data collection;

   (e) associating an action involving said graphical representation or a part thereof with a function such that performing said action on said graphical representation or a relevant part thereof results in performing said function on:

      i. a corresponding said category;

      ii. a corresponding said data file;

      iii. any combination of the above,

wherein the method enables:

A. navigation of a data collection by relying on correlations between metadata for each data file in a data collection and correlations between categories of data file; and

B. performing one or more functions on a data collection by performing an action on a graphic representation of the corresponding respective part of the data collection.

2. A computer-implemented method for navigating a data collection according to claim 1, including the further steps of:

(a) identifying a baseline from which navigation of said data collection commences, said baseline including a data file selected from said data collection

(b) calculating a correlation between said baseline and other data files within said data collection;

(c) calculating a correlation between said baseline and other categories within said data collection;

(d) providing a data file or category selection based on said respective correlations such that said selection has a relationship with said baseline;

(e) providing a graphical representation of said data collection;

(f) associating a portion of said graphical representation with said selection and associating an action involving said portion of the graphical representation with a function involving the corresponding selection such that said function can be performed by performing a respective action on a corresponding portion of said graphical representation

wherein the method enables a first and subsequent selection from a data collection, each selection having a relationship with a preceding selection and being made by performing an action on the relevant corresponding portion of a graphic representation of the data collection.

3. A computer-implemented method for navigating a data collection according to claim 1 or claim 2 including the further step of:

   (a) analysing metadata regarding a data file selected in a first selection;

   (b) calculating a correlation between said metadata and metadata regarding other data files in said data collection such that said other data files are sorted according to a degree of correlation between respective data files;

   (c) providing a subsequent selection of said other data files based on substantial concordance between said metadata regarding said other data files and said metadata regarding said data file in said first selection;

   wherein the method enables refinement of a subsequent selection based on a preceding selection.

4. A computer-implemented apparatus for navigating a data collection such as a collection of digitised music files including:

   (a) means for analysing metadata regarding each of a plurality of data files in a data collection;

   (b) means for calculating correlations between said metadata to sort data files such that said data files are sorted into one or more categories based on said correlations between respective metadata;

(c) means for calculating correlations between said categories to enable ranking of said categories by degree of relative correlation such that a relationship between said categories is defined;

(d) a graphical representation of said data collection and of said categories of data files within said data collection such that a viewer is enabled to view at least a part of said data collection;

(e) means for associating an action involving said graphical representation or a part thereof with a function such that performing said action on said graphical representation or a relevant part thereof results in performing said function on:

i. a corresponding said category;

ii. a corresponding said data file;

iii. any combination of the above,

wherein the apparatus enables:

A. navigation of a data collection using correlations between metadata for each data file in a data collection and correlations between categories of data file; and

B. performing one or more functions on a data collection by performing an action on a graphic representation of the corresponding respective part of the data collection.

5. A computer-implemented apparatus for navigating a data collection according to claim 4, further including:

(a) means for identifying a baseline from which navigation of said data collection commences, said baseline including a data file selected from said data collection

(b) means for calculating a correlation between said baseline and other data files within said data collection;

(c) means for calculating a correlation between said baseline and other categories within said data collection;

(d) means for providing a data file or category selection based on said respective correlations such that said selection has a relationship with said baseline;

(e) a graphical representation of said data collection;

(f) means for associating a portion of said graphical representation with said selection and associating an action involving said portion of the graphical representation with a function involving the corresponding selection such that said function can be performed by performing a respective action on a corresponding portion of said graphical representation

wherein the apparatus enables a first and subsequent selection from a data collection, each selection having a relationship with a preceding selection and being made by performing an action on the relevant corresponding portion of a graphic representation of the data collection.

6. A computer-implemented method for navigating a data collection substantially as herein described with reference to the accompanying drawings.

7. A computer-implemented apparatus for navigating a data collection substantially as herein described with reference to the accompanying drawings.

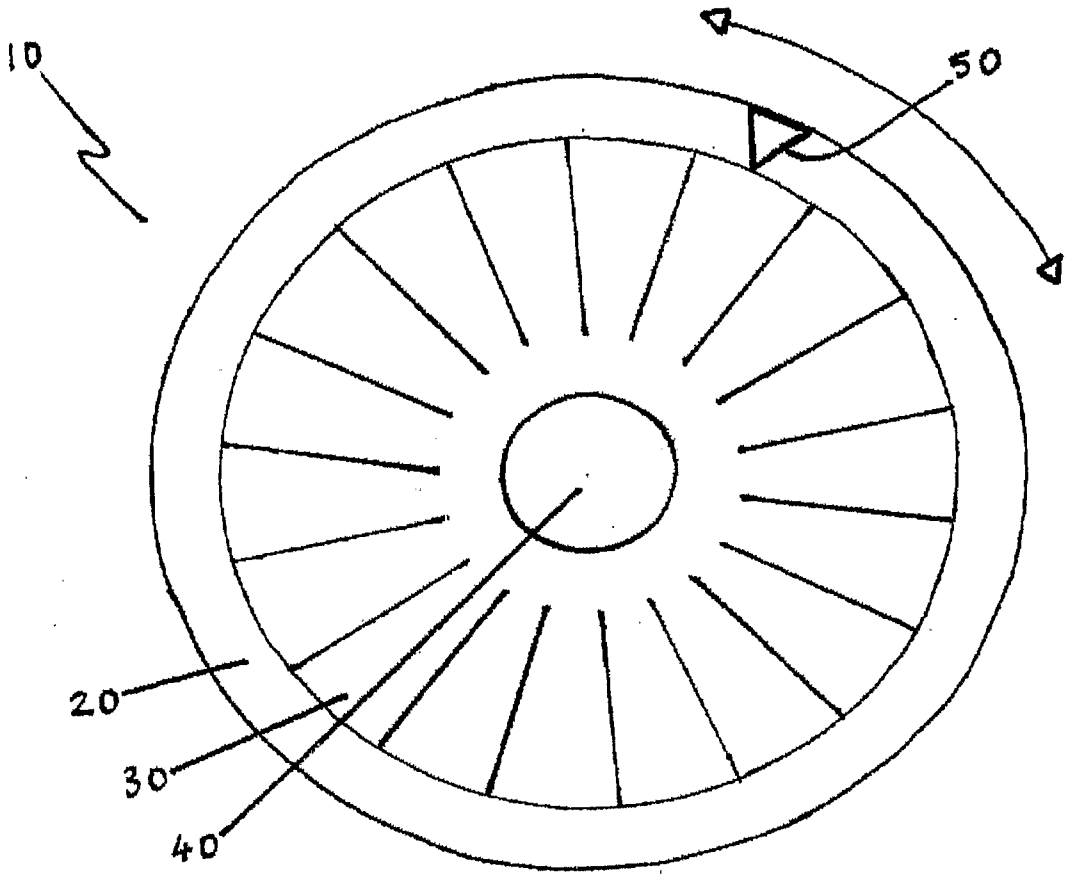

FIGURE 1

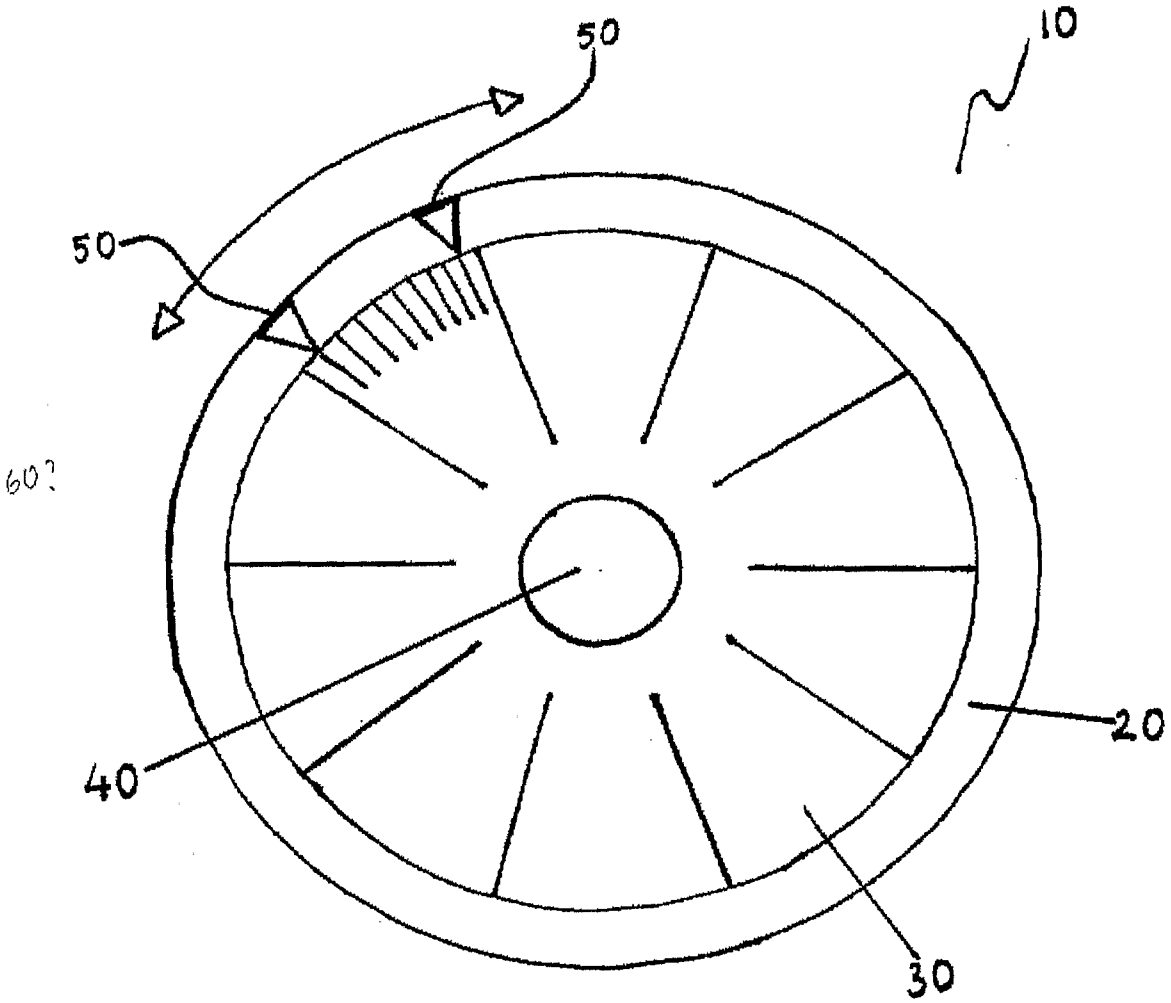

FIGURE 2

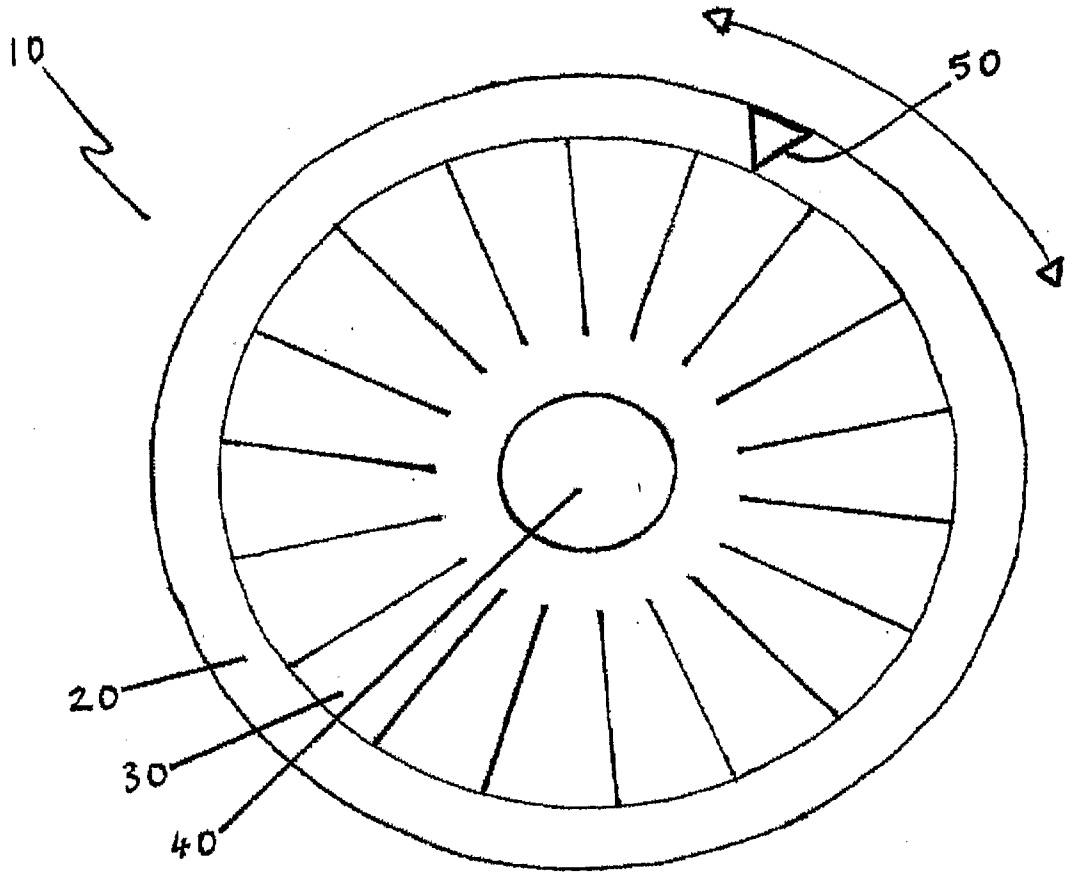

FIGURE 3

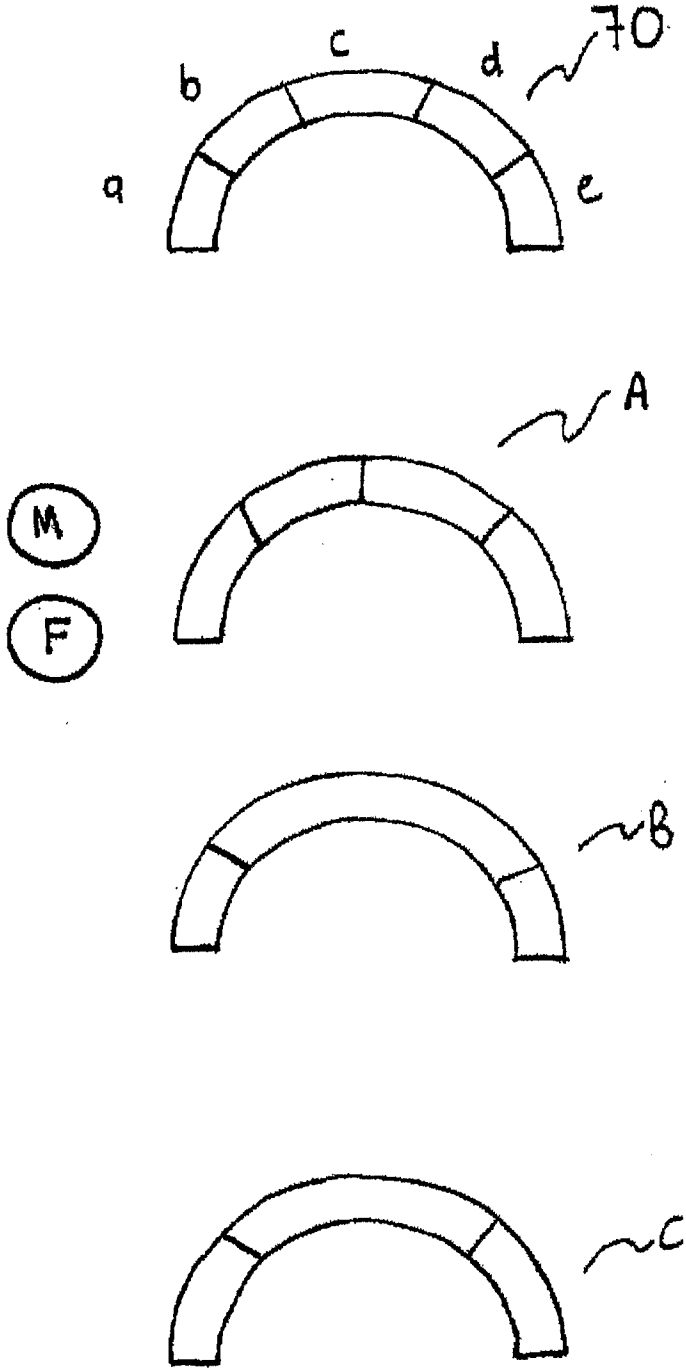

FIGURE 4

INTERNATIONAL SEARCH REPORT

International application No.
PCT/AU2009/000419

A. CLASSIFICATION OF SUBJECT MATTER

Int. Cl. ***G06F 3/048*** (2006.01)Int. Cl. ***G06F 17/30*** (2006.01)

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)

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)
EPODOC, WPI with G06F 17/30 and keywords including GUI, database, "graphical user interface", rank+, class+, select, search, music.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 6674452 B1 (KRAFT et al) 6 January 2004 Whole document	1 - 5
A	US 6933433 B1 (PORTEUS et al) 23 August 2005 Whole document	1 - 5
A	US 2002/0075330 A1 (ROSENZWEIG et al) 20 June 2002 Whole document	1 - 5
A	US 2007/0180389 A1 (HOLM et al) 2 August 2007 Whole document	1 - 5

[X] Further documents are listed in the continuation of Box C [X] See patent family annex

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
10 June 2009	18 JUN 2009
Name and mailing address of the ISA/AU AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaustralia.gov.au Facsimile No. +61 2 6283 7999	Authorized officer **J.W. THOMSON** AUSTRALIAN PATENT OFFICE (ISO 9001 Quality Certified Service) Telephone No : +61 2 6283 2214

INTERNATIONAL SEARCH REPORT

International application No.
PCT/AU2009/000419

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2007/0288453 A1 (PODILCHUK) 13 December 2007 Whole document	1 - 5
A	WO 2001/073598 A2 (KONINKLIJKE PHILIPS ELECTRONICS N.V.) 4 October 2001 Whole document	1 - 5
A	WO 2002/095611 A2 (KONINKLIJKE PHILIPS ELECTRONICS N.V.) 28 November 2002 Whole document	1 - 5
A	WO 2008/034187 A1 (WALKER) 27 March 2008 Whole document	1 - 5

INTERNATIONAL SEARCH REPORT

International application No.
PCT/AU2009/000419

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

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

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☒ Claims Nos.: **6 and 7**
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
The claims 6 and 7 do not comply with Rule 6.2(a) because they rely on references to the description and/or drawings.

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a)

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

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

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

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.

☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.

☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.
PCT/AU2009/000419

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report		Patent Family Member					
US	6674452	NONE					
US	6933433	NONE					
US	2002075330	US	7020848				
US	2007180389	EP	1979863	WO	2007088419		
US	2007288453	CN	101181898	DE	102007029163	US	2007286458
		US	2007286497	US	2007286528	US	2007288432
		US	2007288452	US	2007296567	US	2008025596
		US	2008123901	US	2008126345	US	2008133521
		US	2008273801	WO	2008097327		
WO	0173598	CN	1489734	EP	1384170	US	6505194
WO	02095611	CN	1511292	EP	1405216	US	2005102186
WO	2008034187	AU	2007299588				

Due to data integration issues this family listing may not include 10 digit Australian applications filed since May 2001.

END OF ANNEX