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(71) Applicant(s):
Evangelos Pappas-Katsiafas
10 Strympole Way, Highfields, CALDECOTE, Cambs, CB23 7ZJ, United Kingdom

(72) Inventor(s):
Evangelos Pappas-Katsiafas

(74) Agent and/or Address for Service:
Evangelos Pappas-Katsiafas
10 Strympole Way, Highfields, CALDECOTE, Cambs, CB23 7ZJ, United Kingdom

(54) Title of the Invention: **Image display system**
Abstract Title: **Displaying images as a spiral of helix film strip**

(57) A computer system is configured to display a plurality of images on a display screen. The system is further configured to display the images such that the images are sequentially positioned along a path and the images move in sequence along the path in response to an input command to the system. The images define a sequence of images on the surface of a continuous film strip; the film strip defines at least one spiral or helix; the film strip is represented on said display screen as a perspective view in 3D space such that inner turns of said spiral or helix are visible; and the images are displayed such that a size of a said displayed image reduces towards a central end of the or each said spiral or helix in accordance with said perspective view.

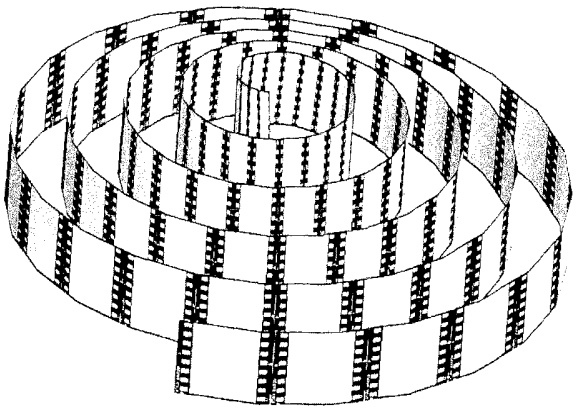

Figure 8

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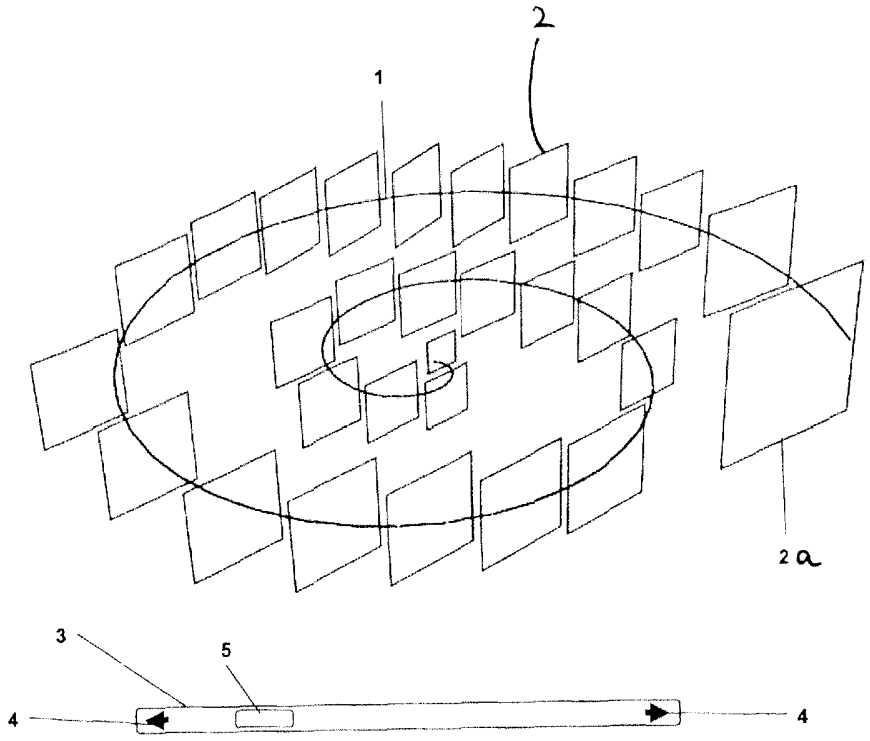

Figure 1

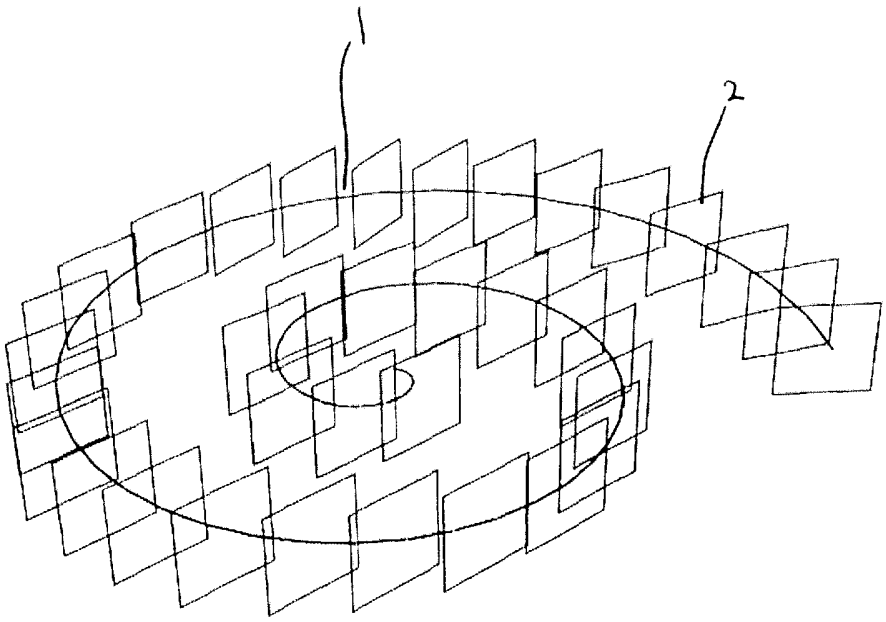

Figure 2

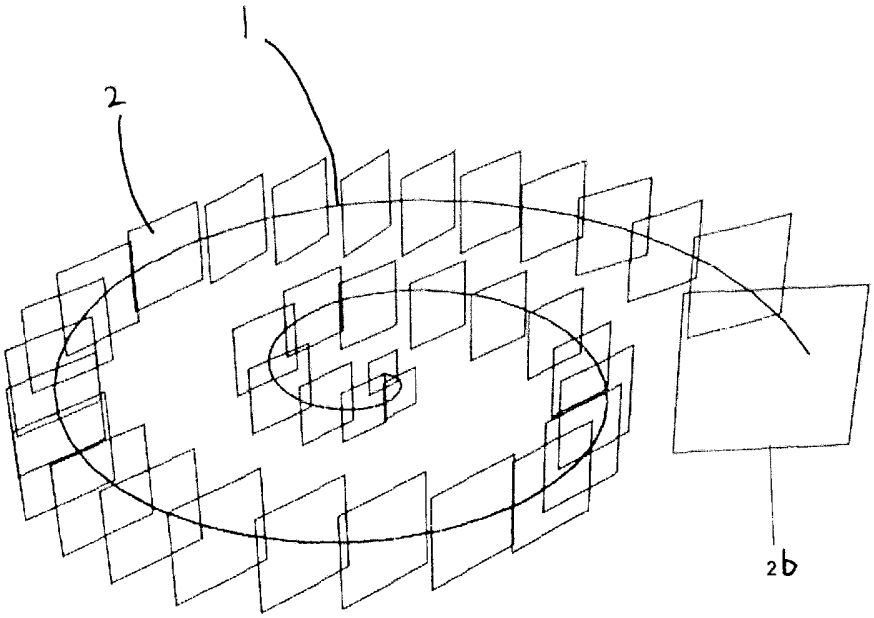

Figure 3

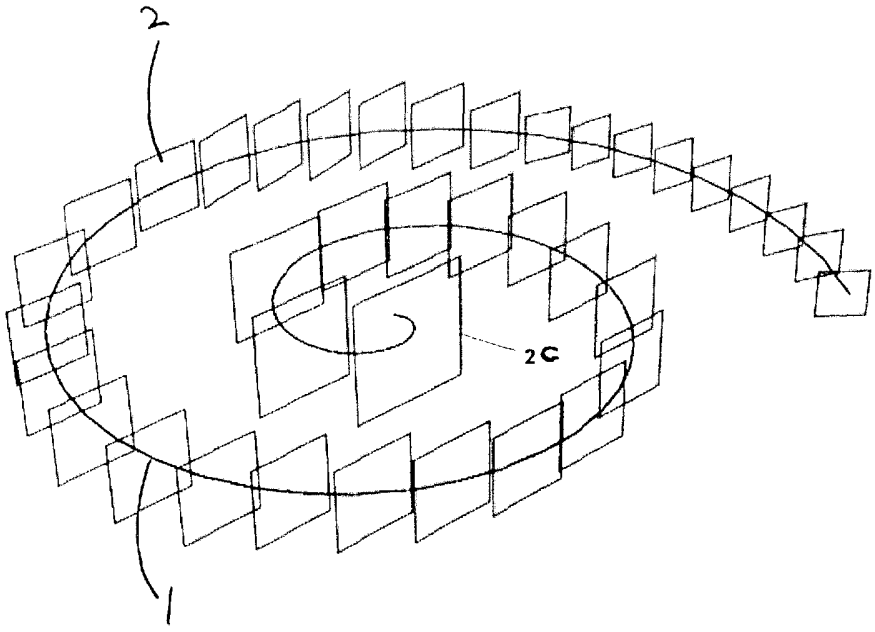

Figure 4

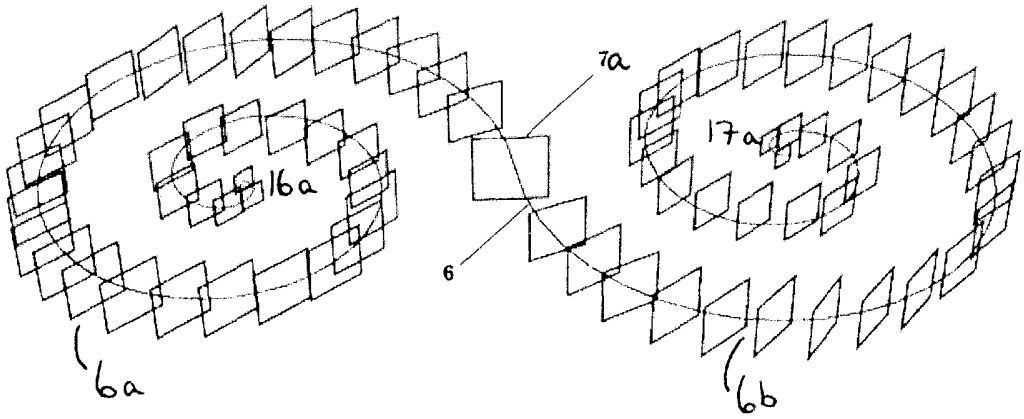

Figure 5

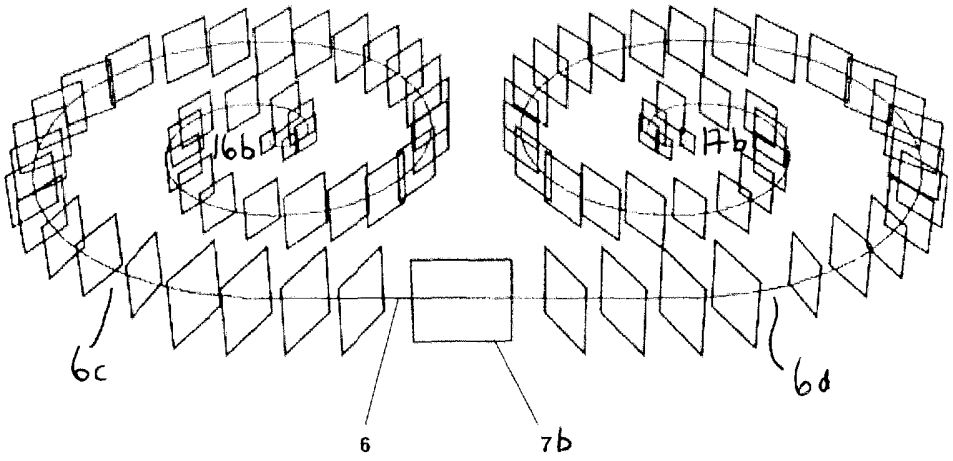

Figure 6

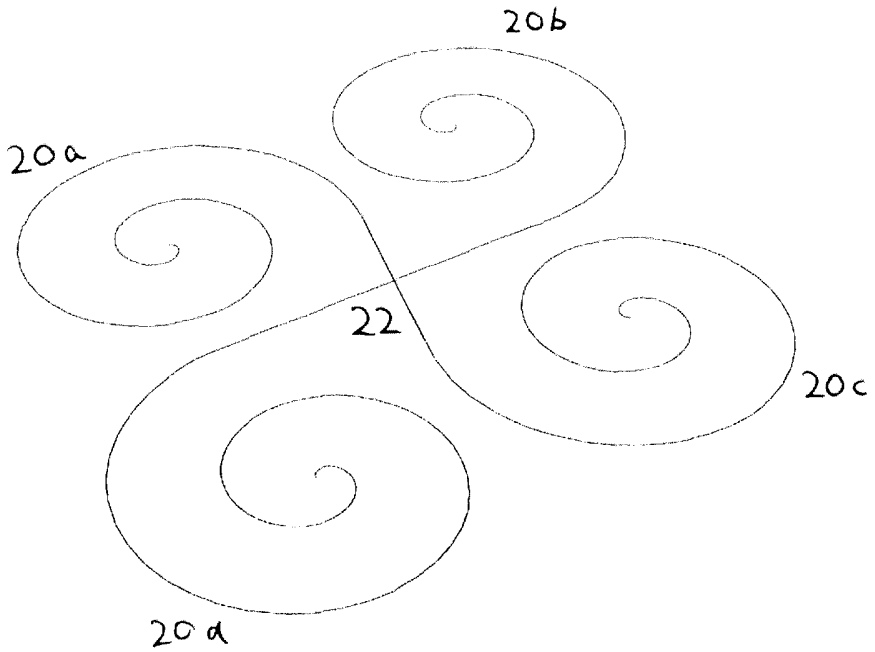

Figure 7

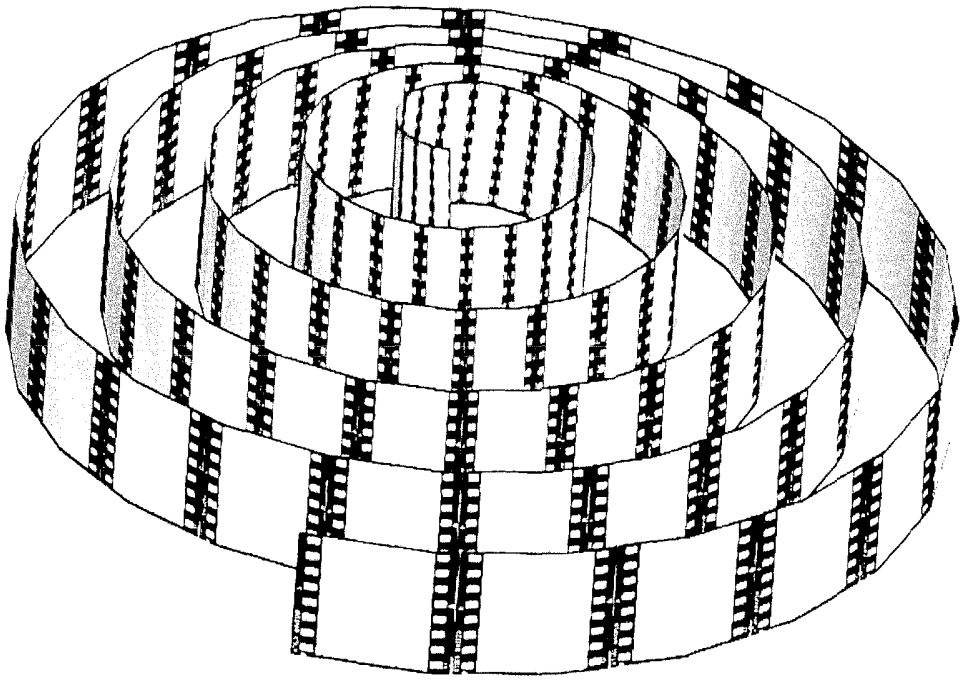

Figure 8

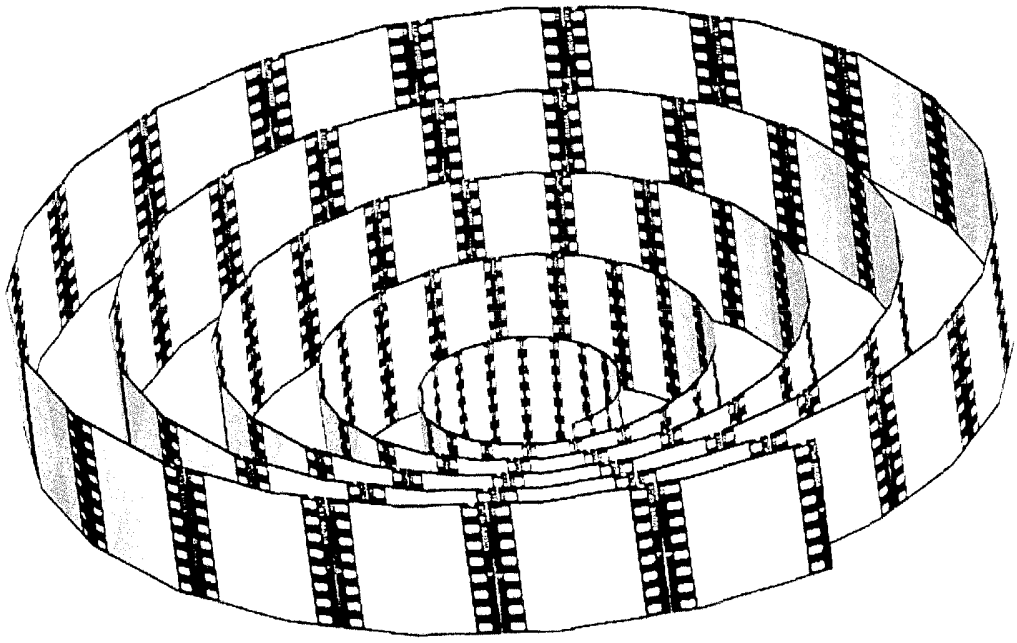

Figure 9

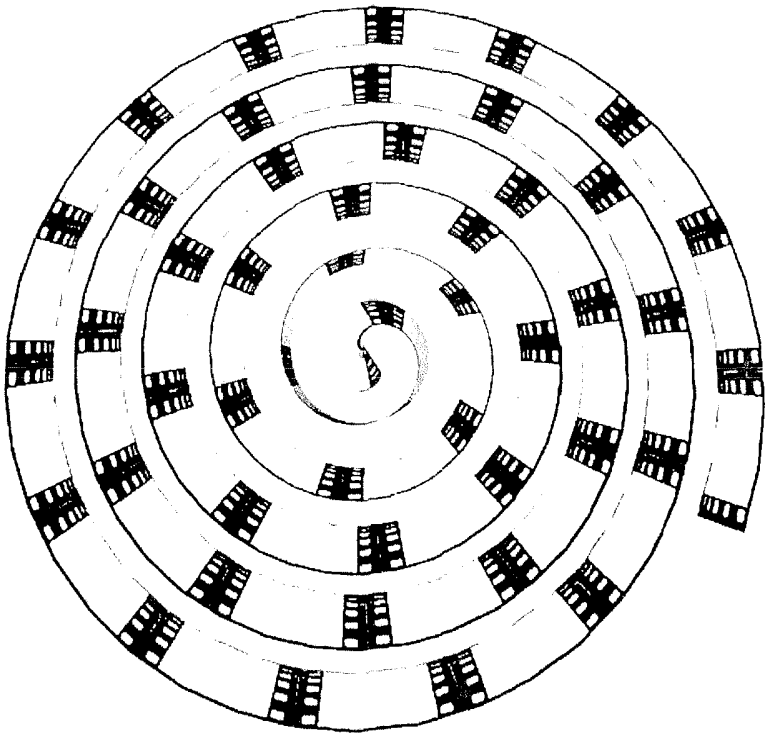

Figure 10

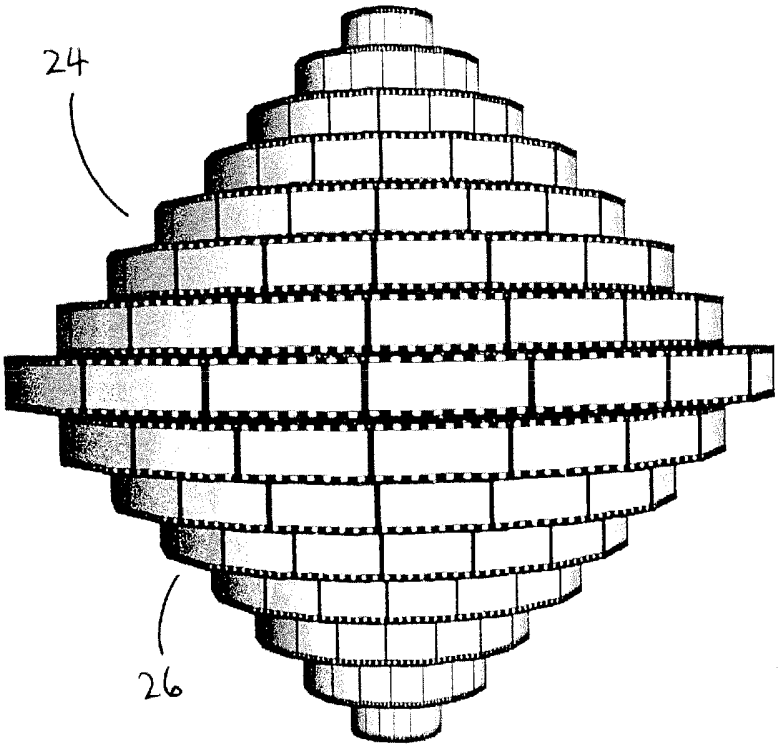

Figure 11

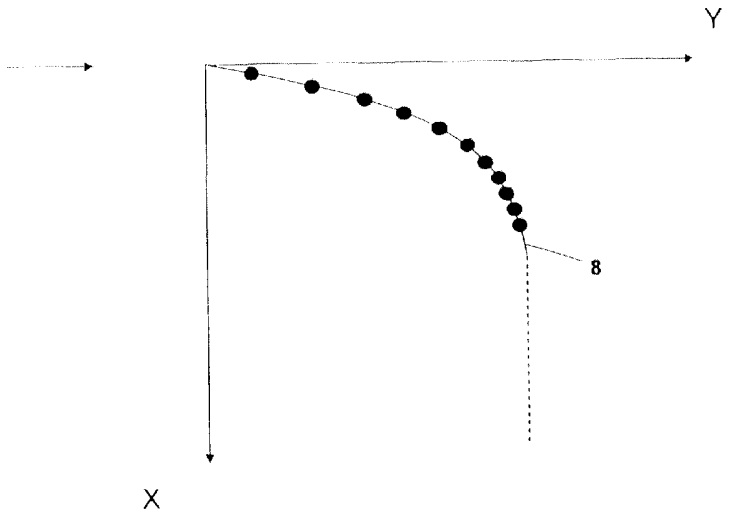

Figure 12

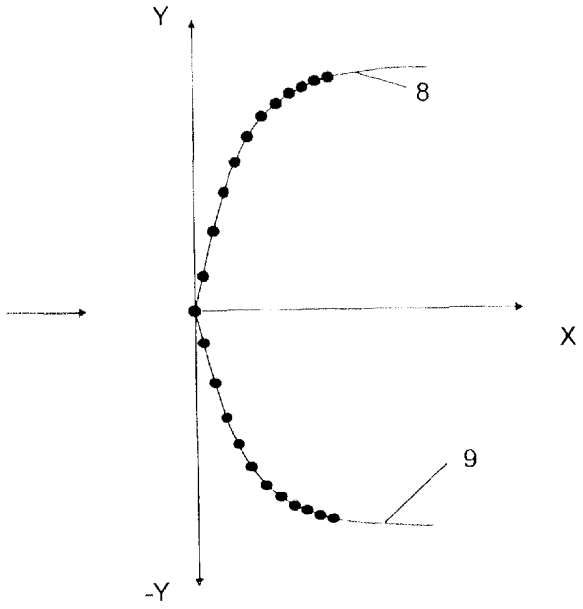

Figure 13

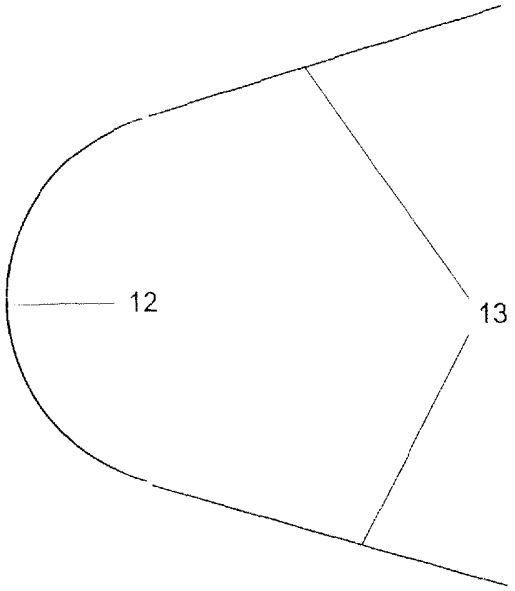

Figure 14

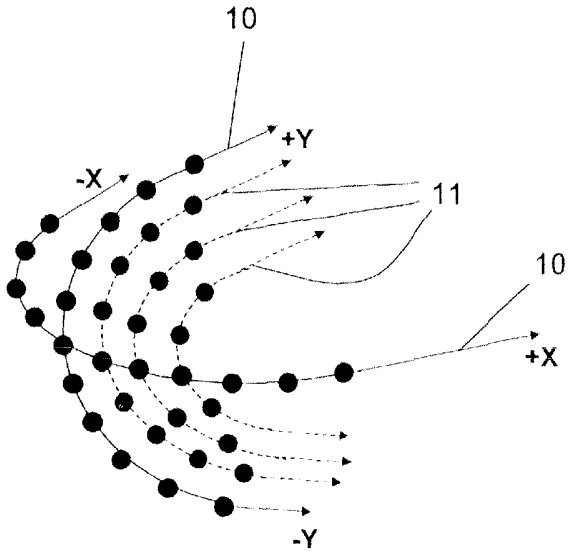

Figure 15

IMAGE DISPLAY SYSTEM

Field of the Invention

The present invention relates to image display systems, particularly computer systems for displaying images.

Background of the Invention

Displaying a plurality and sequence of images on a computer display can be limited by the dimensions and the resolution of the display, e.g. a display of 3 inches (76.2 mm) diagonal dimension, 4:3 aspect ratio, and 320×240 pixels resolution. The number of images that can be displayed by a particular display at any one time whilst these images can be identified and perceived by a viewer is limited using conventional image-display approaches.

In one approach, images may be viewed individually, according to a predetermined sequence. The image displayed on the screen may be changed in response to a command from a user, or alternatively, the images may be displayed in "slide show" format, i.e. the images are displayed in sequence such that each image is displayed on the screen for a predetermined period. This approach allows the images to be identified and viewed, but is time-consuming and does not allow a user to select images of interest quickly or efficiently.

Otherwise, an entire set or subset of images may be available for display on the screen simultaneously. This allows a user to move more easily to an image of interest. However, browsing through a large sequence of images on a computer display can cause images to disappear suddenly at the edges of the display. Further, by displaying a plurality of images simultaneously, the size of each image on the display screen

is limited and identification of individual images may be made more difficult.

Thus there is still a desire for improved approaches for displaying and browsing images on a computer display.

Summary of the Invention

The invention is set out in the independent claims.

In general terms, the present invention provides a system and/or a method for displaying and/or browsing a large sequence of images simultaneously on a computer display, such that the images and their sequence may be easily perceived and identified. Aspects of the invention may relate to image display and browsing with 3D effects on a computer display.

Advantages of the invention can be:

- Display of a large amount of images per given area (amount of pixels, or physical area with a given dots per inch resolution,) while the images are still identifiable.
- Display of a large sequence of images in a given area (amount of pixels, or physical area with a given dots per inch resolution,) while the sequence of images is easy and intuitive to follow.
- Display of a subset of all the displayed images in the foreground.
- Display of images along recognisable and intuitive geometrical paths which are easy for the human vision to follow.
- Display of images which are not overlapping or are only slightly overlapping.

- Provision of intuitive motion/movement of images along the image display paths.

- Provision of a specific orientation of the images relative to the viewer which make the images easy to identify.

A first aspect of the present invention provides a computer system having a display screen, the system being configured to display a plurality of images on the screen,

wherein the system is further configured to display the images such that the images are sequentially positioned along a path and the images move in sequence along the path in response to an input command to the system.

By positioning the images sequentially along a path, the images are displayed such that a user may view a plurality of images simultaneously. At the same time, the user is able to command the system to move the images in sequence along the path and so may bring an image of interest to a point along the path where it may be examined more closely.

Thus, an advantage of the present invention is that it may allow a large amount of images to be displayed per given area, the area being characterised e.g. as a physical area on the display screen or as a number of pixels, while providing the user with means for identifying and/or examining the images more closely.

For example, the images may be arranged so that there is partial overlap between adjacent images. In this case, there is typically one image located at a predetermined point along the path that may be viewed in its entirety. By moving the images in sequence along the path, each image of interest may be brought in turn to the predetermined point, where it may be viewed in more detail. Alternatively, the images may be arranged to have no overlap between adjacent images.

Another option is for the system to be configured to display the images on the screen such that the size of each one of the images on the screen (e.g. the number of pixels occupied by the image) varies with the location of the image along the path. In this case, by moving the images in sequence along the path, each image of interest may be brought in turn to a position at which its size on the screen is greater than that of the other images, so that it may be examined in detail by the user.

Typically, at least a portion of the path on which the images are positioned and along which they are moved is curved. For example, the curved path may comprise a spiral or a helix, such as a conical helix. It is thought that by placing and moving the images along a curved path, the sequence of images is made easy for the human vision to follow, such that the images are easy to identify and perceive. The sequence of images may be placed along a single curved line. Otherwise, the sequence of images may be placed along a single line that is formed by two curves.

Preferably, the display provides an illusion of depth. That is, the path and/or the images are rendered as objects in 3D space. For example, a spiral or helix path may be rendered on the screen using perspective, and the border and content of each image itself may be rendered using perspective. To preserve the illusion, images on the path to the fore of the object can assume a greater size than images on the path further back.

A curved path may comprise a plurality of spirals, e.g. two spirals that are connected to form a single line. Similarly, a curved path may comprise a plurality of helices, e.g. two conical helices that are connected to form a single line.

Preferably, the images are arranged on the path, e.g. a spiral or a helix, such that all the images positioned on the path are visible to the user. That is, the apparent 3D nature of the e.g. spiral or helix, as observed by a user, nonetheless preferably allows the user to view all the images positioned on the path.

The path may be a single line which is formed by an arc and two tangent lines at the ends of the arc. A plurality of such lines may be displayed on the display screen, providing a plurality of paths.

The curved path may comprise a number of loops that are arranged in sequence along a common axis, the radius of the loops increasing in a first direction of the common axis. Thus, the images positioned along the curved path may collectively provide a substantially conical shape.

Typically, the system is configured to allow the user to scroll through the images. For example, the system may be configured to display a draggable element on the screen, such that movement of the images along the path is controlled by the movement of the draggable element across the screen. In other cases, the system may be configured to respond to an input command comprising dragging, moving, tilting, or rotating of an input device. That is, the movement of the images along the path may be controlled by the position and/or motion and/or orientation of such an input device. Changes in position and/or motion and/or orientation of an input device may be represented on the screen, e.g. by a draggable element, but this is not essential. In some cases, the computer system may be configured to respond to an input command comprising a gesture made by the user, e.g. through the movement of the user's hand or head. Alternatively, the computer system may be configured to respond to a voice command.

In the case that the system is configured to display the images on the screen such that the size of each image on the screen varies with the location of that image along the path, the path may have a position at which the images attain their maximum size. For example, the position of maximum size may be at one end of the path. Alternatively, the position of maximum size may be positioned between the ends of the path, e.g. at the midpoint of the path. The midpoint of the path may be, for example, the midpoint between two connected spirals.

Typically, the system is configured to display the images on the screen such that the images appear to a viewer to lie in respective image planes that do not necessarily correspond to the plane of the screen. This can allow images to be displayed on the screen such that each individual image occupies a small area of the screen, but remains easily identifiable by the user. Moreover, each image plane may vary as the corresponding image moves along the path.

In general, the images on display on the screen at any one instant are part of a larger set of images, and the system is further configured to indicate on the screen the proportion of images from that larger set that are on display on the screen.

The computer system of the first aspect of the present invention is particularly suitable for use with relatively small display screens, e.g. a display screen having a diagonal dimension of 3 inches (76.2 mm), an aspect ratio of 4:3, and a resolution of 320×240.

In general, the present invention may allow a plurality and sequence of images to be displayed on a computer display screen, such that a large number of images may be included on the display area at a good level of resolution, the arrangement being adapted with respect to the human ability to

perceive, identify and follow the sequence of images. The images and their sequence may be easy to track and follow because they are placed and moved along specific geometrical paths which are easy to perceive and understand. The present invention may provide efficient and intuitive browsing and navigation through a plurality, sequence and collection of images.

The images may be arranged on the display screen such that the user perceives them to be at different distances, positions and orientations relative to each other, thus creating a 3D effect. The user and viewer can browse the images by moving them along specific paths. The images can change their orientation to the viewer as they are moved along a predefined path.

A second aspect of the invention provides the use of the computer system of the previous aspect for displaying and/or browsing images.

A third aspect of the invention provides a computer program for controlling a computer system having a display screen, the computer program causing a plurality of images to be displayed on the screen such that the images are sequentially positioned along a path, and further causing the images to move in sequence along the path in response to an input command to the system. Thus, in combination with a programmable computer and a display screen, the computer program can be used to provide the computer system of the first aspect. Optional features of the computer system have corresponding optional features in the computer program.

A fourth aspect of the invention provides a computer program product carrying the computer program of the third aspect. For example, the computer program product may be a computer

memory device or disk such as a magnetic, optical or magneto-optical disk.

Brief Description of the Drawings

Embodiments of the invention will now be described by way of example with reference to the accompanying drawings in which:

Figure 1 shows a display screen from a computer system according to a "single spiral" embodiment of the invention.

Figure 2 shows a display screen from a computer system according to another "single spiral" embodiment of the invention.

Figure 3 shows a display screen from a computer system according to another "single spiral" embodiment of the invention.

Figure 4 shows a display screen from a computer system according to another "single spiral" embodiment of the invention.

Figure 5 shows a display screen from a computer system according to a "double spiral" embodiment of the invention.

Figure 6 shows a display screen from a computer system according to another "double spiral" embodiment of the invention.

Figure 7 shows a display screen from a computer system according to a "quad spiral" embodiment of the invention.

Figure 8 shows a display screen from a computer system according to a "film roll" embodiment of the invention.

Figure 9 shows a display screen from a computer system according to another "film roll" embodiment of the invention.

Figure 10 shows a display screen from a computer system according to another "film roll" embodiment of the invention.

Figure 11 shows a display screen from a computer system according to a "decked cone" embodiment of the invention.

Figure 12 shows a curve that may form the basis for an image path in an embodiment of the invention.

Figure 13 shows another curve that may form the basis for an image path in an embodiment of the invention.

Figure 14 shows another curve that may form the basis for an image path in an embodiment of the invention.

Figure 15 shows a display screen from a computer system according to a "quad exponential" embodiment of the invention.

Detailed Description

In a first embodiment, the present invention comprises a computer system having a display screen. The display screen is configured to display a graphical user interface which is produced by a media application program. The graphical user interface includes an application window generated by the media application program. The application window displays a plurality and sequence of images. The application window also provides the means for browsing through the images, the means being e.g. a draggable element.

The proposed novel methods for displaying and browsing through a plurality of images in a computer display are presented and exemplified below.

Figures 1, 2, 3 and 4 show display screens from computer systems according to different embodiments of the invention, the images being positioned along a spiral path.

In the embodiments of Figures 1, 2, 3 and 4, a sequence and plurality of images 2 are positioned along a spiral 1 or conic helix path in a 3D space, i.e. the spiral 1 or conic helix is positioned such that it appears to the user to occupy 3 dimensions. The user is presented with a 2D projection on the display screen of the apparent 3D scene. The images 2 are positioned at regular intervals along the spiral or helical path. Each image appears to the user to lie in a respective image plane which does not necessarily correspond to the plane of the screen, and each apparent image orientation is chosen in such a way so the viewer can see the image as clearly as possible. The sequence of images is perceived as forming a spiral (or conical helix) shape in the 3D space. In Figure 1, the viewing point and other parameters of the 2D projection of the apparent 3D scene are such that all images can be seen without any overlapping among them. However, this method can also be applied to partially overlapping images (see Figures 2, 3, and 4).

The first image of the sequence, i.e. the image located at an end of the spiral path, may appear to be larger than the rest of the images. That is, the first image occupies a greater area on the screen and is associated with a greater number of pixels than the remaining images on the path. In Figures 1 and 3, the largest and primary image is the outermost image 2a, 2b on the spiral or conical helix. In Figure 4, the largest and primary image is the innermost image 2c on the spiral or conical helix. In Figure 2, no single image is clearly larger than the others, i.e. each image occupies the same area of the screen (although the corners of the images overlap). In Figures 1, 3, and 4, all other images on the path appear to be smaller than the primary image 2a, 2b, 2c. The images after the primary image 2a, 2b, 2c become gradually smaller along the path. This way the last image on the path will have the smallest size.

Using an input command, the viewer/user can advance the images along the spiral or conical helix path by one image at a time, or can cause the images to move continuously along the spiral path. When advancing by one image at a time, all images move along the spiral path until one takes the place of the next one, i.e. each image moves until it occupies the position previously occupied by its nearest neighbour image. The viewer/user can advance the images along the spiral path in a radially inward direction of the spiral or in a radially outward direction of the spiral. The first image of a sequence of images is placed at the outermost position of the path.

The user can use a scrollbar 3, i.e. a draggable element, to move the images, as well as other input commands. The two arrows 4 at the two ends of the scroll bar advance the images one at a time, i.e. the arrows 4 may allow the images to be moved so that each image occupies the position previously occupied by its nearest neighbour image. The thumbnail 5 in the scrollbar 3 indicates the portion of the visible images from the whole sequence to be browsed, that is the thumbnail 5 acts as a symbol on the display screen to show the proportion of images from the whole sequence that is on display on the screen.

If the entire plurality of images to be browsed through can be displayed and positioned on the path and the user moves or advances the sequence of images by one image in a radially outward direction of the spiral, then the radially outermost image on the spiral path becomes the radially innermost image on the spiral path and all the other images advance one position in a radially outwards direction of the spiral.

If the total amount of the sequence images to browse is greater than the available positions on the path, the last images on the sequence are not displayed. When the user

advances the sequence of images by one image in a radially outward direction of the spiral the radially outermost image becomes the last in the sequence and hence it is not displayed. All other images advance a position on the path. The first of the images that were not visible (before the user advanced the display by one image) becomes positioned at the radially innermost position of the spiral path and is visible to the user.

Figures 5 and 6 show display screens from computer systems according to further embodiments of the invention, showing images positioned along a double spiral path.

In the embodiments of Figures 5 and 6, a sequence and plurality of images is placed along a continuous path 6 which is formed by two connected spirals 6a, 6b, 6c, 6d (or conical helices) in an apparent 3D space. The path may comprise two spirals that each turn in a clockwise direction (e.g. as shown in Figure 5), two spirals that each turn in an anticlockwise direction, or one spiral that turns in a clockwise direction and one spiral that turns in an anticlockwise direction (e.g. as shown in Figure 6). The method of viewing and scrolling through the images is similar to that described for the "single spiral, conical helix" embodiments of Figures 1-4, but the path is different. The primary image 7a, 7b is in the centre of the path, i.e. at a midpoint between the two ends of the path. The sequence of the visible images starts from one end 16a, 16b of the curved line and finishes at the other end 17a, 17b. The two ends of the curved line are the radially innermost points of the two spirals or conical helices.

In the embodiment of Figure 5, an image moving from the end 16a of the path 6 towards the other end 17a will first move in a clockwise direction along spiral 6a, until it reaches the midpoint between the two spirals 6a and 6b. The image will then start to move in an anticlockwise direction along spiral

6b. Similarly, if an image is moved from the end 17a to the end 16a of the path, the image will initially move in a clockwise direction along spiral 6b until it reaches the midpoint between the two spirals 6a and 6b. It will then move in an anticlockwise direction along spiral 6a.

In the embodiment of Figure 6, an image moving from the end 16b of the path 6 towards the other end 17b will move in an anticlockwise direction along spiral 6c, and will continue to move in this anticlockwise direction after it has passed the midpoint between the two spirals and is moving along spiral 6d. Similarly, if an image is moved from the end 17b to the end 16b of the path, the image will move in a clockwise direction along spirals 6d and 6c in turn.

Thus, when the path comprises two connected spirals, images moving along the path may move in a clockwise direction along their entire trajectory from one end of the path to the other. Alternatively, they may move in an anticlockwise direction from one end of the path to the other. In other cases, the images may move in an anticlockwise direction along one portion of the path and in a clockwise direction along the next portion of the path, or vice versa.

The images at the radially innermost positions of the spirals (or conical helices) may be smaller than the other images (i.e. it occupies a smaller area of the screen) and the image at the midpoint/centre of the path may be the largest (i.e. it occupies the largest area of the screen). Hence it is the most prominent and highlighted one.

Figures 5 and 6 illustrate the two spirals or conical helices in a horizontal arrangement, i.e. the radially innermost points of the spirals lie on the same horizontal line. Alternatively, the two spirals may be in a vertical

arrangement, i.e. the radially innermost points of the spirals (or conical helices) lie on the same vertical line.

The two spirals (or conical helices) can be placed in any orientation to each other, i.e. not only vertical or horizontal but also in any angle between them.

Figure 7 shows display screens from computer systems according to another embodiment of the invention, showing images positioned along a quad or n^{th} degree spiral.

In the embodiment of Figure 7, a sequence and plurality of images is placed along four spirals 20a, 20b, 20c, 20d which are connected around the centre 22 of the display area. The method of viewing and scrolling through the images is similar to that described for the "double spiral, conical helix" in the embodiments of Figures 5 and 6, but there are now two "double spirals, conical helices". The crossing point of the two lines, each line comprising a double spiral, may remain empty, i.e. no image is displayed there, or it may be used to display the middle picture of the current sequence of visible images. This embodiment may be extended to use any even number of spirals, i.e. 4, 6, 8, 10 etc.

Figures 8, 9 and 10 show display screens from computer systems according to further embodiments of the invention.

In the embodiments of Figures 8, 9, and 10, a film strip - comprising of images - is being placed along a spiral (or conical helix) path with adequate space among the turns of the spiral so all images, in their entirety or part of them may be seen from a specific point of view, i.e. in the 2D projection of the apparent 3D scene. That is, the apparent 3D orientation of the e.g. spiral or helix, as observed by the user, should preferably allow the user to view all the images positioned on the path. The film strip is like a film roll with some significant spacing between its turns. When the

user advances the film roll by one image in a radially outward direction of the spiral, the radially outermost image becomes the radially innermost image, and all other images advance one position in a radially outward direction. When the user advances the film roll by one image in a radially inward direction of the spiral, the radially innermost image becomes the radially outermost image, and all other images advance one position in a radially inward direction of the spiral. The advancement of images - one or more at a time - may be achieved using a scrollbar 3 similar to the one appearing in Figure 1.

In a further embodiment of the invention, a film strip comprising of images may be placed along a path which is formed by two spirals (or conical helices) which are connected forming a continuous line. The path of the film strip is similar to the one shown in Figures 5 and 6. The spacing of the path, i.e. the spacing of successive turns of a spiral, and the width of the film roll is chosen carefully so all the images on the film roll can be seen from a specific point of view, i.e. a 2D projection on the display screen of the apparent 3D scene. This embodiment is similar to that of Figures 8, 9, and 10, but now the radially outermost images of the two spirals do not need to become the radially innermost images when the user advances the images by one or more images at a time. The user can advance the images towards the one roll or the other. As the user advances the images from a first spiral towards a second spiral, the radially outermost images of the first spiral move towards the second spiral and they will eventually become images of the second spiral if the user keeps advancing them towards the second spiral. In this embodiment of the invention, there is no abrupt transition of an image from the radially outermost to the radially innermost position of the spiral film roll.

Figure 11 shows a display screen from a computer system according to a further embodiment of the invention.

Reels of photographic film are stacked on top of each other forming two cones 24, 26. The cones 24, 26 are arranged symmetrically, having a common base, as shown in Figure 11. The viewer is presented with a 2D projection of an apparent 3D scene. Each reel can be rotated around its vertical axis so all the images on it can be moved to the front (i.e. the images can be moved so that they appear closest to the user in the apparent 3D scene) after some length of scrolling. The user can select the reel to be scrolled by using a pointing device e.g. a mouse, and then scroll the reel by moving the pointing device sideways or by using a horizontal scrollbar.

The user can also scroll the structure in the vertical direction, i.e. each film reel may be moved to a new position along a line connecting the apices of the cones 24, 26. For example, if the user scrolls the structure downwards by one film reel, all film reels take the position which was beneath them before the scrolling action. The reel at the centre of the structure is the most magnified one, i.e. this reel includes images that occupy a greater area of the display screen than other images of the other film reels, and may therefore be regarded as the highlighted one.

Figures 12, 13, and 14 show curves that may be used as a basis for the curved path along which the images are sequentially positioned.

In a further embodiment of the invention, a sequence and plurality of images may be positioned along some curved paths. Each path (for example a "double exponential" path) may be composed of two exponential curves 8, 9 constructed according to the following equations:

Curve 8: $y = 1 - e^{-x}$

Curve 9: $y = -(1 - e^{-x})$

Curve 9 is symmetrical with curve 8 about the y axis. Figure 12 shows curve 8, while Figure 13 shows a path including both curves 8 and 9.

Figure 14 shows an alternative curved path along which images may be sequentially positioned. In Figure 14, the double exponential path is approximated by a semicircle or an arc 12 and two tangent or approximately tangent lines 13 at the edges of the semicircle or arc.

Figure 15 shows a display screen from a computer system according to a further embodiment of the invention.

Figure 15 shows a display screen on which images are sequentially positioned along the "double exponential" path shown in Figures 12 and 13. The user is presented with a 2D projection of an apparent 3D scene. The images are positioned along the paths at regular or irregular intervals. The images may be displayed on the screen such that the images appear to the user to lie in a plane that does not correspond to the plane of the screen. In this case, each image orientation is chosen in such a way so the viewer can see the image as clearly as possible. The viewing point and other parameters of the 2D projection onto the display screen of the apparent 3D scene are such that all images can be seen without any overlapping of images. Alternatively, the images may be positioned on the screen so that there is partial overlapping of images. The viewer/user may move the images one at a time or continuously along the "double exponential" path. This movement can be achieved with the use of a scrollbar such as the scrollbar 3 shown in Figure 1, or alternatively by using e.g. a mouse to click on the sequence of images and moving the images along the path as required.

The viewpoint of the 2D projection on the display screen of the apparent 3D scene is such that the image positioned at one end of the path appears to be in the foreground, i.e. occupies a greater area on the display screen than the other images. Figure 15 shows two "double exponential" paths 10 which are arranged at right angles to form an apparent 3D "quad exponential" scene. Figure 15 shows further "double exponential" paths 11 that are parallel to one of the "double exponential" paths 10.

While the invention has been described in conjunction with the exemplary embodiments described above, many equivalent modifications and variations will be apparent to those skilled in the art when given this disclosure. Accordingly, the exemplary embodiments of the invention set forth above are considered to be illustrative and not limiting. Various changes to the described embodiments may be made without departing from the scope of the invention.

Further aspects of the invention are defined in the following clauses:

1. An image browsing and display method which displays a large sequence of images simultaneously on a computer display, while the images and their sequence are easy to identify and easy to perceive.

2. An image browsing and display method according to clause 1 which displays images without any overlap among them.

3. An image browsing and display method according to clause 1 which displays images with some partial overlap among them.

4. An image browsing and display method according to clause 1 which places a sequence of images along a single curved line.

5. An image browsing and display method according to clause 1 which allows the browsing of images by moving and scrolling the images along a single curved line.

6. An image browsing and display method according to clause 4 which places a sequence of images along a spiral line.

7. An image browsing and display method according to clause 4 which places a sequence of images along a conical helix line.

8. An image browsing and display method according to clause 4 which places a sequence of images along a single line consisting of two spiral lines which are connected forming a single line.

9. An image browsing and display method according to clause 4 which places a sequence of images along a single line consisting of two conical helix lines which are connected forming a single line.

10. An image browsing and display method according to clause 1 which displays images mapped on the surface of a film roll or film reel.

11. An image browsing and display method according to clause 10 where the film roll follows the path of a spiral or conical helix so all the images in the film roll are viewable.

12. An image browsing and display method according to clause 10 where the film roll follows the path of two spirals or conical helixes in such a way that all images in the film roll are viewable.

13. An image browsing and display method according to clause 10 using a number of film rolls stacked on top of each other forming a cone.

14. An image browsing and display method according to clause 1 which places a sequence of images along a single line which is formed by an arc and two tangent lines at the ends of the arc.

15. An image browsing and display method according to clause 1 which places a sequence of images along a single line which is formed by two curves.

And also in these clauses:

1. A computer system having a display screen, the system being configured to display a plurality of images on the screen,

wherein the system is further configured to display the images such that the images are sequentially positioned along a path and the images move in sequence along the path in response to an input command to the system.

The path comprises two or more connected spirals. The connection line between the spirals can be a straight line or a curve.

2. A computer system according to clause 1, wherein the path comprises two or more connected helixes. The connection line between the helixes can be a straight line or a curve.

3. A computer system according to clause 1, wherein the path comprises two or more connected conic helixes. The connection line between the conic helixes can be a straight line or a curve.

4. A computer system according to clause 1, wherein the path comprises of a set of two or more non-connected, semi circles, or semi ellipses, whose planes are parallel to each other.

5. A computer system according to any previous clause wherein the pictures appear as a film roll following the described path.

6. A computer system according to any one of the preceding clauses, wherein the path is rendered as an object in 3D space.

7. A computer system according to any one of the preceding clauses, wherein the images are rendered as objects in 3D space.

8. A computer system according to any one of the preceding clauses, wherein the system is further configured to display a draggable element on the screen, wherein the movement of the images along the path is controlled by movement of the draggable element.

9. A computer system according to any one of the preceding clauses, wherein the size of each image on the screen varies with the location of that image along the path.

10. A computer system according to clause 9, wherein the path has a position at which the images attain their maximum size.

11. A computer system according to any one of the preceding clauses, wherein the images appear to a viewer to lie in respective image planes that do not necessarily correspond to the plane of the screen.

12. A computer system according to clause 11, wherein each image plane varies as the corresponding image moves along the path.

13. A computer system according to any one of the preceding clauses, wherein the images on display on the screen at any one instant are part of a larger set of images, and the system is further configured to indicate on the screen the proportion of images from that larger set that is on display on the screen.

14. Use of the computer system according to any one of the preceding clauses for displaying and/or browsing images.

15. A computer program for controlling a computer system having a display screen, the computer program causing a plurality of images to be displayed on the screen such that the images are sequentially positioned along a path, and further causing the images to move in sequence along the path in response to an input command to the system.

The path comprises two connected spirals, or two connected helices or two connected conic helixes.

Or the path comprises of a set of two or more non-connected, semi circles, or semi ellipses, whose planes are parallel to each other.

16. A computer program product carrying the computer program of clause 15.

CLAIMS

1. A computer system having a display screen, the system being configured to display a plurality of images on the screen,

wherein the system is further configured to display the images such that the images are sequentially positioned along a path and the images move in sequence along the path in response to an input command to the system;

wherein said images define a sequence of images on the surface of a continuous film strip;

wherein said film strip defines at least one spiral or helix;

wherein said film strip is represented on said display screen as a perspective view in 3D space such that inner turns of said spiral or helix are visible; and

wherein said images are displayed such that a size of a said displayed image reduces towards a central end of the or each said spiral or helix in accordance with said perspective view.

2. A computer system according to claim 1, wherein the path comprises two or more connected helixes.

3. A computer system according to claim 2, wherein said connected helixes are conic helixes.

4. A computer system according to claim 1, 2 or 3, wherein the system is further configured to display a draggable element on the screen, wherein the movement of the images

along the path is controlled by movement of the draggable element.

5. A computer system according to any preceding claim, wherein the path has a position at which the images attain their maximum size.

6. A computer system according to any one of the preceding claims, wherein the images on display on the screen at any one instant are part of a larger set of images, and the system is further configured to indicate on the screen the proportion of images from that larger set that is on display on the screen.

7. Use of the computer system according to any one of the preceding claims for displaying and/or browsing images.

8. A computer program product carrying a computer program for controlling a computer system having a display screen, the computer program causing a plurality of images to be displayed on the screen such that the images are sequentially positioned along a path, and further causing the images to move in sequence along the path in response to an input command to the system;

wherein said images define a sequence of images on the surface of a continuous film strip;

wherein said film strip defines at least one spiral or helix;

wherein said film strip is represented on said display screen as a perspective view in 3D space such that inner turns of said spiral or helix are visible; and

wherein said images are displayed such that a size of a said displayed image reduces towards a central end of the or each said spiral or helix in accordance with said perspective view.

Application No: GB1202450.1 **Examiner:** Dr Russell Maurice

Claims searched: 1-8 **Date of search:** 31 May 2012

Patents Act 1977: Search Report under Section 17

Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular relevance
A	-	WO 2007/094902 A2 (MICROSOFT CORP) see e.g. paragraphs 5, 11, 12, 28
A	-	US 2005/160375 A1 (SONY CORP) see e.g. paragraphs 6-12, 73-81 and figure 17

Categories:

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.

Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC^{X} :

Worldwide search of patent documents classified in the following areas of the IPC

G06F

The following online and other databases have been used in the preparation of this search report

WPI, EPODOC, XPIPCOM, XPI3E, INSPEC, XPIEE

International Classification:

Subclass	Subgroup	Valid From
G06F	0003/048	01/01/2006