(12) UK Patent Application (19) GB (11) 2462097 (13) A

(43) Date of A Publication 27.01.2010

(21) Application No: 0813477.7

(22) Date of Filing: 23.07.2008

(71) Applicant(s):
William Stanley Poel
Hockham Hill, Spring Elms Lane, Little Baddow, CHELMSFORD, Essex, CM3 4SD, United Kingdom

(72) Inventor(s):
William Stanley Poel

(74) Agent and/or Address for Service:
William Stanley Poel
Hockham Hill, Spring Elms Lane, Little Baddow, CHELMSFORD, Essex, CM3 4SD, United Kingdom

(51) INT CL:
H04N 7/18 (2006.01)

(56) Documents Cited:
EP 1351172 A1
JP 2000306092 A
US 20070040033 A1
JP 2002290964 A
US 20080129689 A1

(58) Field of Search:
INT CL **H04N**
Other: **Online: WPI, EPODOC**

(54) Abstract Title: **Time Delayed Display of Captured Image of Person to Themselves**

(57) This invention relates to methods and apparatus to provide versatile alternatives to traditional "real time" reflective mirrors by using a high definition camera and programmable digital video delay loop, connected to a video display.
One specific benefit of the Slow Mirror is to allow users to "see behind themselves" when trying on new clothes or checking their hair styling.
This is simply achieved by slowly turning through 360 degrees in front of the "Slow Mirror" and then stopping again in front of the display and watching the delayed play back of this image.
The Slow Mirror system can allows the user to preset the delay time (for example) in the range 2-10 seconds, and to freeze the playback at any time and to scroll forward and back through the motion, and to request a still image be captured and or printed.

Figure 3

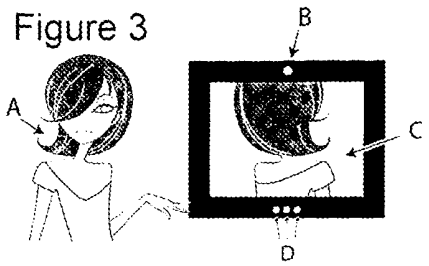


Figure3: The Slow Mirror in action

Two primary operational modes are suggested

1. The user selects a control button (D) in the frame corresponding to the delay (X seconds) required. And then turns around 360 degrees. The display shows the image delayed by X seconds

2. The user selects a control button (D) in the frame that sets a single shot delay period of X seconds. The user then turns around and waits for until they hear a beep, indicating the shot was taken and the image frozen. User then turns around to study the image at their leisure, and can reset the process by pressing another button in the group.

Advanced features would include the ability to zoom in and out and save the image for later review or comparison.

GB 2462097 A

SlowMirror

SPECIFICATION

THE SLOW MIRROR

1.1 METHOD AND APPARATUS FOR PROVIDING THE FUNCTIONS OF A DIGITAL MIRROR

This invention relates to methods and apparatus for providing the functions of a mirror using a combination of video camera(s), a digital signal processing system with video storage memory and various function options, and a display screen or screens.

Although currently such screens will generally be based on LCD or OLED technologies, the Slow Mirror may equally well use a form of laser or other projection system as its display system.

1.2 Basic functional of the Slow Mirror

The Slow Mirror system comprises a video camera that may be either fixed to the frame or located to suit the user, and is then used to capture a video stream of the user that is sent to a digital processing unit connected to a display device which can be any type of appropriate computer monitor or TV combined with direct video input option.

The Slow Mirror technology then allows the user to set an adjustable delay, to allow the user to examine images that are captured during the time when the user is turned away from the display screen.

A simple example would be use in a clothes shop changing room where a fixed camera facing the same direction as the display uses a 3-5 second delay that allows users to rotate through 360 degrees to assess their appearance from all angles.

A simple extension would be to allow users to take copies of images using a USB memory stick or upload the relevant data file(s) directly to a suitable mobile phone or other Bluetooth compatible receiving device.

A more complex solution would require a Slow Mirror connected to a network that allowed the user to email selected images to an email address that the user could provide in a variety of ways ranging from local keyboard data entry to sending an SMS message to a phone number where a requested image was returned to the same number in the form of an MMS message.

Users who had previously registered their cellphone number and other details could also arrange for the images to be sent to an email address. Such a process would enable the store operator to include sales promotion and advertising material along with the images – such as an offer to encourage the user to buy the product being viewed.

1.3 Enhancements

The general application of the Slow Mirror in a commercial location such as clothes store requires the simplest form of operation with fixed parameters. However, the use of Slow Mirror technology in the home allows the user to become familiar with more complex features and facilities.

In a consumer's home, the system is less likely to be supplied including a display monitor, but as a stand-alone unit to be connected to a

display monitor supplied by the user, such as an existing TV set or computer display screen.

A more detailed range of user controls are possible that will permit the user to adjust the period of time delays and other aspects of the system's behaviour.

1.4 Remote camera

A remote camera – directly cable-connected or wireless – can be positioned and switched directly to display its output on the display, or used in a split screen or "picture-in-picture" display to give both front and (rear) views simultaneously.

1.5 Magnifying Mirror with built-in illumination

The use of magnifying mirrors based on optically formed mirrors is well understood. Such mirrors provide a fixed magnification factor for applications such as shaving or precision application of make-up, especially eye make up.

A Slow Mirror for this type of application includes the necessary signal processing electronics to provide adjustable magnification to allow for the accurate application of products such as eye liner, and the insertion of contact lenses etc. Such magnification may be selected manually using controls arranged around the edge of the device, or remotely using infra red control – or perhaps best of all, by sensing the proximity of the face of the user such that the magnification factor varies as the face approaches closer.

This can be achieved using any one of the various range finding technologies including ultrasound echo to reflective IR ranging.

In an application such as a bathroom mirror, a heating system may be applied to prevent the formation of condensation on its surface.

Instead of the user of a magnifying slow mirror requiring additional illumination (as in a stereotype example of the makeup mirror with lights arranged the edge), a variable proportion of the Slow Mirror display pixels in the border zone can be switched to "bright white" and thus providing especially effective local illumination for such tasks as inserting contact lenses etc.

1.6 Quiescent Advertising Application

The Slow Mirror system can be supplied with a business model that derives a cost subsidy from advertising and sponsorship.

In the case of a Slow Mirror being used in commercial premises such as a clothes store, active use of the mirror may be determined by a proximity motion detector.

When no person is detected within a preset range, the display can revert to showing advertisements; but as a user approaches the mirror, at a preset distance, the display can present a sequence of images: first a greeting for the user, then a message from the sponsor(s), then brief instructions on what it does, and how to make best use of it.

In a teenager's bedroom, the default application when the mirror function is not required is most likely to be Facebook and social networking in general.

Where displays are networked, information such as Text messages intended for members of the household and email alerts can be fed direct to the displays in the form of Marquee displays or "crawlers"

Such an integrated scheme will require various user options to be to be controlled from a server, and accessed via a web browser.

All Ethernet networked screens will also be able to display TV programmes (speakers required for sound) fed by an appropriate IP-based entertainment distribution systems.

If the user is familiar with the system, a button placed somewhere convenient (eg on the frame) will skip the instruction phase – or re-call it in case of subsequent difficulty.

Advertising material provided for digital signage can comprise any combination of fixed or moving images with or without sound.

For non-networked installations, advertising content can be stored locally installed using transportable memory in the form of USB memory sticks, or otherwise uploaded to memory contained within the Slow Mirror for the purpose.

Or the mirror may be connected to any form of data network that is able to deliver interactive advertising images.

Such data networks might include hard-wired Ethernet, cellular phone networks capable of data transmission, or other forms of wireless data network include WiFi, Bluetooth or custom solutions.

The Slow Mirror advertising mode may also include facilities for interacting with persons in the immediate vicinity using a feedback mechanism such as Bluetooth communication with accessible cell phones, and where such interaction invites a response from the receiver of data, the Slow Mirror can receive the response and send this back to a central information collation and management service using the available network(s).

1.7 Uses in conjunction with other applications

The Slow Mirror is basically a computer display with a specific application. So that display may also be made available for other purposes, many of which have particular synergy with locations in a domestic environment. In order to use the Slow Mirror in its alter ego as a computer display, a means of communicating with the system delivering information to the display will be required.

This may be a local keyboard, the display itself could be a touch panel although cost will be a limiting factor. A portable wireless device with Bluetooth – such a cellphone – can also provide basic control.

Ultimately, voice control may be a practical option.

In a domestic application, a "hall mirror" is frequently located at the main entry/exit point of a home. The Slow Mirror has obvious applications here (Figure one) but since this is ALSO a general purpose display screen, it may revert to displaying any other information supplied it – especially relevant to its location. In the hallway example, such information might be local weather and traffic information.

In the kitchen, it could be used to display information collected from sensors that monitor power consumption at various points in the home. Another popular non-Mirror application might be to display the eBay watch lists of the users.

In the bathroom, depending on time of day, it can be used to display "health tip of the day"

In other applications is may just be desirable to display visual artwork or the contents of photograph albums.

1.8 CLAIMS

(1) Method and apparatus for a display system that enhances and extends the functions of a traditional glass mirror using an electronic solution comprising camera, control electronics and display device(s) to represent the way a traditional glass mirror is used for vanity applications in home and commercial situations and also extends beyond traditional mirror capabilities to including image freeze, time delay, zooming, storing, printing and otherwise processing images in real time and from storage memory.

(2) Method and apparatus for the Slow Mirror using elements of its own display technology to provide extra illumination for close-up applications such as the application of eye make-up and insertion of contact lenses

(3) Method and apparatus for a combination of a Slow Mirror and digital signage applications, where the Slow Mirror reverts to a general signage application when it is not being used in Mirror mode.

(4) Method and apparatus for the combination of a Slow Mirror display and general applications for the presentation of data and video delivered using IP services over Ethernet networking.

Figure 1

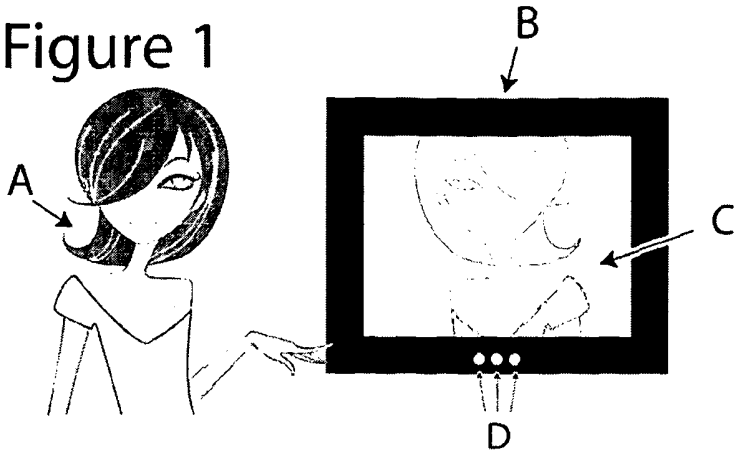


Figure 2

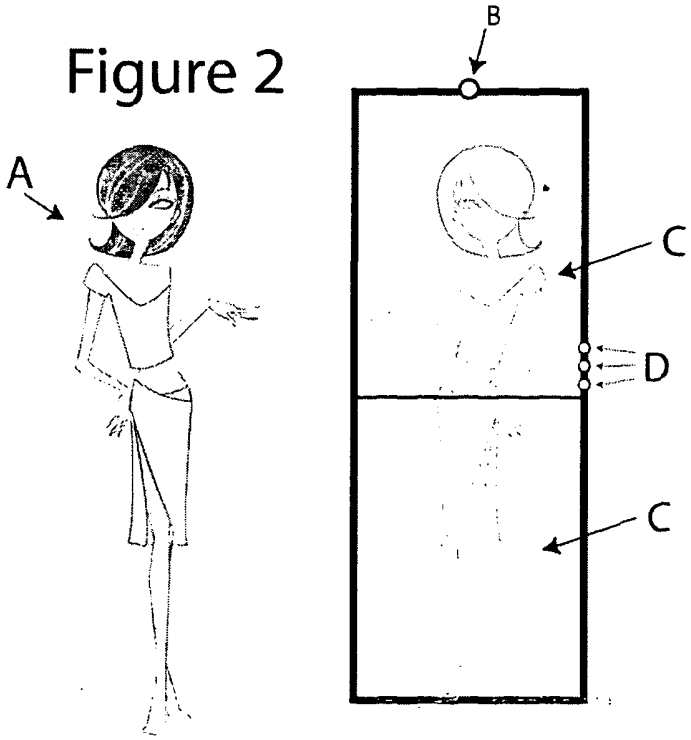
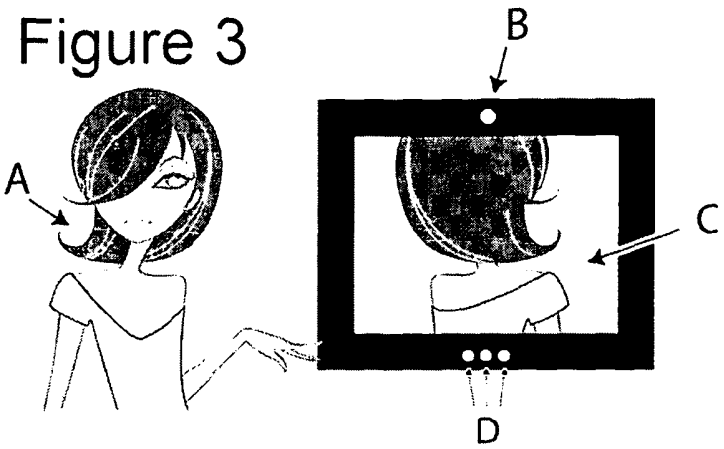


Figure 3



Key

Figure1: The Basic Mirror

The only difference from the users perspective is that there may be visible control buttons on the frame.

Subject A
The camera may be located in the frame at point B; C is the display surface; D is the control button panel

Figure2: The Basic Mirror: full length

LCD displays suitable for full length mirror applications do not exist, but can be easily made by stacking two displays in this fashion.

Alternatively, a laser projector may be used.

Figure3: The Slow Mirror in action

Two primary operational modes are suggested

1. The user selects a control button (D) in the frame corresponding to the delay (X seconds) required. And then turns around 360 degrees. The display shows the image delayed by X seconds

2. The user selects a control button (D) in the frame that sets a single shot delay period of X seconds. The user then turns around and waits for until they hear a beep, indicating the shot was taken and the image frozen. User then turns around to study the image at their leisure, and can reset the process by pressing another button in the group.

Advanced features would include the ability to zoom in and out and save the image for later review or comparison.

Application No: GB0813477.7 **Examiner:** Iwan Thomas

Claims searched: 1 **Date of search:** 14 November 2008

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
X	1, 2 and 4	US 2007/0040033 A1 (ROSENBERG) See whole document, especially paragraphs [0110] - [0116]
X	1 and 4	JP 2002290964 A (DOKURITSU) See abstract
X	1	JP 2000306092 A (NADEISU) See abstract
X	1	US 2008/0129689 A1 (JUNG) See especially paragraphs [0024], [0031], [0032], [0035], [0040] and claim 11
X	1	EP1351172 A1 (SHIMA) See abstract

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

H04N

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

Online: WPI, EPODOC

International Classification:

Subclass	Subgroup	Valid From
H04N	0007/18	01/01/2006