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(54) **INTERACTIVE SHOWCASE WITH IN-BUILT DISPLAY SCREEN**

(57) The invention relates to an interactive showcase with an integrated display screen that combines the display of a product with the presentation of said product, of the type that comprises a central space (1) for placing the products that are to be displayed and a display screen (2) that defines the front part of the central space (1) and comprises a light source (3) having a plurality of LEDs (41) distributed around the edge of the inner part of the

display (2) and focused perpendicularly in relation to a reflective surface (4) in such a way that the display screen (2) is backlit; where said display screen (2) comprises first zones (5) via which the actual product in the showcase is displayed and second zones (6) via which the image of the desired advertisement is shown; and where the showcase also comprises an in-built computer (7).

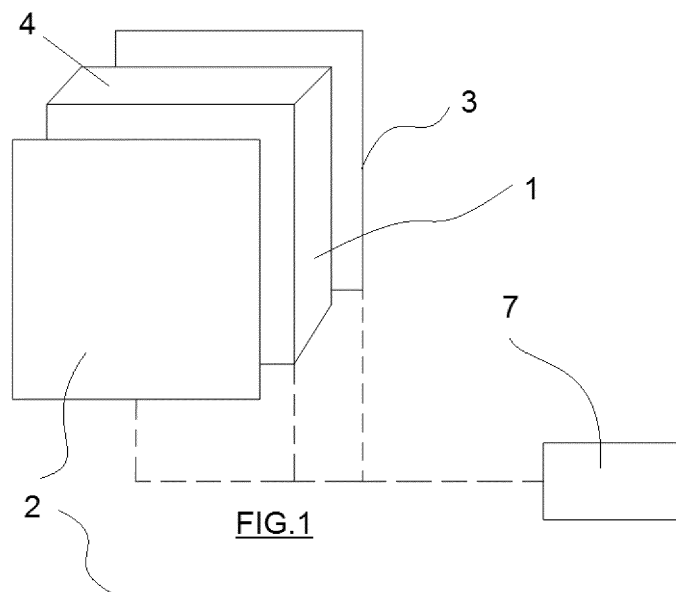


FIG.1

Description

[0001] The present invention falls within the showcases that offer information about products that are placed on them displayed in stores.

STATE OF THE PRIOR ART

[0002] From the state of the art, showcase systems which use projectors to offer some kind of image of the showcase window are known. The most important problem of this type of systems is that they need much light power and space enough to place the projector and that this projects the light inside the showcase in a suitable manner. In addition, the product should be placed in certain positions because in certain places while pointing with the projector the light would strike on the product rather than on the screen of the showcase and it would cast a shadow.

EXPLANATION OF THE INVENTION

[0003] The present invention proposes an interactive showcase. In a preferred embodiment, it comprises a translucent LCD screen. This showcase resolves the problem of projection described above.

[0004] The light in this device only allows seeing the image when it has an internal light source so that otherwise the content of the image to be displayed in the showcase. It is essential to choose properly the way of lighting from the rear portion without that light competes with the image displayed on screen.

[0005] In an embodiment of the invention, the light source used to illuminate the LCD screen of the showcase from the inside is placed so that said light source surrounds the screen from the inside and is projected towards a surface that reflects said light. In a particular embodiment of the invention, said surface that reflects the light is a white surface. This surface acts as a reflection of the light that strikes from the inside of the showcase on the translucent screen in such a way that the image is viewed properly on the screen.

[0006] In the showcase of the present invention can be displayed at the same time real products and images associated with them. The showcase differentiates areas wherein it has to let the actual product is seen always or in many cases so the image displayed fills properly all around.

[0007] It is also contemplates the possibility of the actual product moves and that the LCD screen is synchronized with said movement to raise a much more complete apparent reality. For example, when the product is a toy train that moves around the showcase and the image projected on the LCD screen accompanies the train journey changing the landscape on its way.

[0008] It is also contemplated the option that the product is stationary and the movement from the same from the LCD screen is simulated. For example, if the product

is on a female mannequin in which the screen represents the head and which can detect it, for example by what a camera placed on the screen detects following with the head a person who walks in front of the showcase. The present invention allows for example the mannequin's head to follow the direction of the person who walks in front of the showcase and when it detects that the person has stopped the mannequin's head also stops and talks to him/her.

[0009] The interactive showcase of the invention can have at least a speaker and at least a microphone in order to detect and play sounds. It may also have at least a camera or other presence detection means in such a way that it is activated when it recognizes that there is someone in front of the showcase, thus offering contents based on the type of person who has recognized. For example, if it detects the presence of a child, toys are displayed, if it detects the presence of a man, sport-related products are displayed, etc.

[0010] The present invention also comprises the user interaction with the showcase through mobile phone, for example via NFC, a part of the showcase has activated a system to place orders, fill in surveys or anything else that the user requires.

[0011] In a preferred embodiment of the invention, the showcase comprises a touch sensing layer on the LCD screen in such a way that the user can e.g. write on the screen. This results in providing the screen with touch interactivity.

[0012] The showcase can incorporate connection means via WiFi and Bluetooth with the nearby user devices.

[0013] In other embodiment of the invention, through the use of social networks, it is possible to detect a person, either via Bluetooth or detection of WiFi mac of the showcase. A server confirms the proximity of the user to the showcase and it is possible to offer a specific content for said person, for example a specialized offering, in the showcase. Moreover, it can be displayed the user's photo who has active on a social network for that store.

[0014] It can also be detected a person by combining an image from the camera with other detection system of the person e.g. by the detection of its position, or one of them or a combination of both. Also, the above mentioned camera can detect the movements of people who stop in front of the showcase in such a way that the showcase displays different images on the basis of said movements depending on said movements.

[0015] All of the above is possible with this interactive showcase with the use of a projection rather than a translucent LCD screen.

[0016] This showcase can be connected with the stock of the store in such a way that can promote, or not, the products in it, giving priority to products in stock and not offering those that are not in stock.

[0017] This virtual showcase may have a reader or emit through the screen QR codes or bar codes for easier interaction with the user. It is possible to play the content

of what is displayed on the screen on the mobile phone and use the same as a communication system between the user and the showcase.

[0018] The light source can be a projection of a multimedia projector in two different ways, either with a projection that may or may not be synchronized with the image from the screen, allowing the creation of a scenario in the back of the showcase such that it acts as a light source and at the same time contents may be delivered anywhere in the showcase, or it may be a projection from the rear of the showcase towards the translucent screen from the backside that may allow the light to reflect on the screen in a more controlled way, the contents delivered may or may not be coordinated with the contents of the screen.

[0019] In an embodiment of the invention, there are several translucent screens in the showcase in such a way that it can be created the feeling that there is a floating image within the showcase. In other embodiment of the invention, there is a normal LCD screen as a background for the showcase.

[0020] Throughout the description and claims, the word "comprises" and its variations are not intended to exclude other technical features, additives, components or steps. For those skilled in the art, other objects, advantages and characteristics of the invention will emerge in part from the description and in part from the practice of the invention. The following examples and drawings are provided by way of illustration, and are not intended to be limiting of the present invention. Furthermore, the present invention covers all the possible combinations of particular and preferred embodiments herein indicated.

BRIEF DESCRIPTION OF FIGURES

[0021] Described very briefly hereinafter are a series of drawings that help to better understand the invention and which are expressly related to an embodiment of said invention that is presented as a non-limiting example thereof.

FIG. 1 shows a schematic view of the interactive showcase object of the present invention.

FIG. 2 shows a schematic front view of the display screen (2) that is part of the present invention

FIG. 3 shows a block diagram of the computer (7) that integrates the showcase object of the present invention.

FIG. 4 shows a scheme of the optical behaviour of the light source inside the sales showcase.

DETAILED EXPLANATION OF EMBODIMENTS

[0022] The interactive showcase of the present invention combines the display of the product with the presentation of said product. Thus, the showcase of the invention has a central space (1) for placing the products

that are to be displayed and a display screen (2) that defines the front part of the central space (1) and separates the consumer from the products displayed in the showcase. The showcase of the present invention further comprises a light source (3) that projects light from the interior of the showcase. In an embodiment of the invention, this light source (3) projects the light towards a reflective surface (4) that acts as a reflection of the light when the impact from inside the showcase to the screen (2) is wanted.

[0023] The light source (3) may be a multimedia projector projects an image, synchronized or not with the image on the screen (2); thus acting as a light source (3) and as a transmitter of contents anywhere in the showcase. Emissions carrying out from the projector may be, or not, coordinated with the contents on the screen (2).

[0024] The screen (2) is designed in such a way that it comprises first zones (5) via which the actual product in the showcase is displayed and second zones (6) via which the image of the desired advertisement is shown. It is also possible that the actual product performs certain movements inside the showcase and the screen adapts to said movements in such a way that the second zones (6) will light up displaying the relevant images in each case, for example following the route of the actual product.

[0025] The showcase comprises a computer (7) to which the various elements which comprises for the detection of persons and the management of the display of the different products combined with the different advertisements displayed in each case are connected.

[0026] The interactive showcase may also comprise at least a microphone at least a speaker in order to detect and play sounds.

[0027] Likewise the showcase may comprise presence detection means such as for example cameras or other detection means such that the light source (3) is activated and the corresponding images are displayed in the second zones (6) of the screen when a person passing in front of the showcase is detected. The detection means send a signal in case of detecting any person who activates the light source (3) and the projection of advertisement in the second zones (6) of the screen (2). Moreover, the detection means allow determining if the person who passes in front of the showcase is a man, a woman and a child and on that basis the products most suited to the profile of those who pass by the front are displayed or the advertising is adapted to those profiles

[0028] The lighting can be blurred or with lighting added or coordinated with the displayed product.

[0029] The showcase can allow the touch interactivity with the user in an embodiment that comprises a touch sensing layer. The interaction can also be performed via mobile phone, for example via NFC, WiFi, Bluetooth, etc.

[0030] In a preferred embodiment of the invention, the display screen (2) is a translucent LCD screen. In other embodiment of the invention, a projection on the screen (2) is employed.

[0031] Showcase can be also connected through the computer (7) with the stock of the store in such a way that at each moment the products in stock in the store and without stock are known and based on that information, the showcase is managed only displaying the products in stock and advertising such products.

[0032] In addition, the virtual showcase can have a reader or emit through the screen QR codes or bar codes for easy interaction with the user.

[0033] In an embodiment of the invention, there are several translucent screens (2) in the showcase in such a way that it can be created the feeling that there is a floating image within the showcase. In other embodiment of the invention, there is a LCD screen as a background for the showcase.

[0034] In an embodiment of the invention, the corners of the display area are rounded thereby achieving the camouflage of the line of the vertex and creating a greater sense of depth.

[0035] Furthermore, the present invention comprises an embodiment wherein the showcase is a hanging showcase thereby increasing its versatility and can be part of one greater showcase or can be placed inside the store.

[0036] More specifically, as can be seen in FIG. 3, an illustrative architecture for the computer (7) utilized in the various embodiments of the invention will be described. The computer architecture (7), shown in FIG. 3 illustrates an embedded computer, including a central processing unit 35 (CPU), a system memory 37, including a random access memory 39 (RAM) and a read-only memory (ROM) 311, and a system bus 312 that couples the memory to the CPU 35.

[0037] A basic input/output system containing the basic routines that help to transfer information between elements within the computer, such as during start-up, is stored in the ROM 311. The computer 7 further includes a mass storage device 314 for storing an operating system 316, application programs, and other program modules, which will be described in greater detail below.

[0038] The mass storage device 314 is connected to the CPU 35 through a mass storage controller (not shown) connected to the bus 312. The mass storage device 314 and its associated computer-readable media provide non-volatile storage for the computer 7. Although the description of computer-readable media contained herein refers to a mass storage device, such as a hard disk or CD-ROM drive, it should be appreciated by those skilled in the art that computer-readable media can be any available media that can be accessed by the computer 7.

[0039] By way of example, and not limitation, computer-readable media may comprise computer storage media and communication media. Computer storage media includes volatile and non-volatile, removable and non-removable media implemented in any method or technology for storage of information such as computer-readable instructions, data structures, program modules or

other data. Computer storage media includes, but is not limited to, RAM, ROM, EPROM, EEPROM, flash memory or other solid state memory technology, CD-ROM, digital versatile disks (DVD), or other optical storage, magnetic cassettes, magnetic tape, magnetic disk storage or other magnetic storage devices, or any other medium which can be used to store the desired information and which can be accessed by the computer 7.

[0040] According to various embodiments of the invention, the computer 7 may operate in a networked environment using logical connections to remote computers through a network 318, such as the Internet. The computer 7 may connect to the network 318 through a network interface unit 320 connected to the bus 312. It should be appreciated that the network interface unit 320 may also be utilized to connect to other types of networks and remote computer systems. The computer 7 may also include an input/output controller 322 for receiving and processing input from a plurality of other devices, including a keyboard, electronic stylus (not shown in FIG. 3). Similarly, an input/output controller 322 provides the input and output to a LCD screen (2) of the showcase.

[0041] As mentioned briefly above, a number of program modules and data files may be stored in the mass storage device 314 and RAM 39 of the computer 7, including an operating system 316 suitable for controlling the operation of a networked personal computer, such as the WINDOWS® operating system from MICROSOFT CORPORATION®. The mass storage device 314 and RAM 39 may also store one or more program modules. In particular, the mass storage device 314 and the RAM 39 may store a Web browser application program 310. As known to those skilled in the art, the Web browser application program 310 is operative to request, receive, render, and provide interactivity with electronic documents, such as a Web page 324 that has been formatted using HTML. Moreover, the Web browser application program 310 may be operative to execute scripts contained in the Web page 324, such as for example scripts utilizing the JAVASCRIPT language from SUN MICROSYSTEMS, INC. According to one embodiment of the invention, the Web browser application program 310 comprises the INTERNET EXPLORER Web browser application program from MICROSOFT CORPORATION. It should be appreciated, however, that other Web browser application programs from other manufacturers may be utilized to embody the various aspects of the present invention, such as the FIREFOX Web browser application from MOZILLA FOUNDATION.

[0042] In particular, the Web page 324 may include HTML and scripts which, when displayed by the Web browser application 310, provide a visual display of a program or programs stored on the computer 7. Moreover, the scripts included in the Web page 324 allow a user of the computer to interact with the display provided by the Web browser application 310 and modify the application 310.

[0043] As indicated, the showcase comprises an inter-

nal light source. However, these light sources are of flash type and after various tests and trials, it is observed that said light source prevents a correct contrast and visibility of the LCD screen 2, which logically is an issue in these applications.

[0044] One of the objects of the present invention is to increase the user experience or usability of the showcase, increasing the interaction with the user, for which the LCD screen 2 is provided and, in a practical embodiment, said LCD screen 2 is also tactile. It is for this reason that the sales showcase incorporates an embedded computer 7 with network communication capability and all the functionalities of an advanced computer system, which would make possible, even, the possibility of establishing network games, communication with social networks, participation in promotions among other multiple advantages of converting the vending showcase into a complete terminal connected to the network, as shown in the present specification. However, this is only possible if the LCD screen 2 itself is displayed correctly, while allowing the observation of the marketed products.

[0045] For a correct visualization, after different tests it has been shown that said internal lighting must be reflexive, i.e., it should be reflected in the interior walls of the showcase, without shining directly on the LCD screen 2, since it would dazzle the user and the visualization and practical use thereof would be practically impossible. On the other hand, as indicated, the light should be fully reflected, in such a way that it is oriented towards the LCD screen 2 so that the user can see the projection of images on the same.

[0046] The solution to this technical problem is the combination of two elements: a plurality of white LEDs 41 (that integrate the light source 3) arranged occupying the entire perimeter of the LCD screen 2 and perpendicularly oriented towards the inside 101 of the showcase which comprises a completely white reflective surface 4. In this way, the reflection of light affects the LCD screen 2 itself with an angle α' being backlit in this manner. Note that the LEDs 41 arranged on the left and right sides of the LCD screen 2 also shine on the bottom of inside 101 of the showcase fulfilling the same effect as those of the upper and lower part, as seen in FIG. 4.

[0047] It is also well known that white LEDs 41 do not emit in a single direction but, like any light emitter, have a certain dispersion with an angle α that would reflect on the adjacent walls and/or is oriented towards the area of the product with an angle β , so the dual mission of illuminating the inside and the LCD screen 2 is fulfilled.

[0048] It should be also noted the influence of ambient light in the visibility of the LCD screen 2. To diminish this effect, the showcase incorporates brightness detector allowing computer 7 to set the required power in the white LEDs 41, which will be variable depending on the ambient light.

[0049] It has been suggested that the white light emitted by the LEDs 41 must be reflected in the inside 101 of the showcase. Therefore, it is essential that (a) the

LED 41 is white and (b) that the inside 101 of the showcase is entirely white to facilitate the reflection, since other colour would absorb certain visible light range and harm the visibility of the LCD screen 2. Within the white colours, it would be preferable a dull, matt, white colour, since brightness is seen through the screen and harms the visibility.

[0050] To obtain an inside 101 completely white, it is also preferable that vents of the showcase are also painted in white and/or have a white cover sheet or plate that does not prevent, logically, its function.

[0051] One of the advantages of the invention is, therefore, to have fully updated the stock of products that, through the remote communication, would allow a remote control of the showcase, reducing the maintenance costs. Therefore, the computer 7 enables the remote control or implementation of any protocol that allows establishing a versatile sale and/or controlling the display of the product housed inside on a mobile platform. Thus, the showcase comprises a mobile platform controlled by the computer 7, so that the visibility of the product is significantly increased.

Claims

1. Interactive showcase with an integrated display screen that combines the display of a product with the presentation of said of the type that comprises un central space (1) for placing the products that are to be displayed and a display screen (2) that defines the front part of the central space (1) and is **characterized in that** it comprises a light source (3) having a plurality of LEDs (41) distributed around the inner part of the display screen (2) and focussed perpendicularly in relation to a reflective surface (4) in such a way that the display screen (2) is backlit; and where said display screen (2) comprises first zones (5) via which the actual product in the showcase is displayed and second zones (6) via which the image of the desired advertisement is shown; and where the showcase also comprises an in-built computer (7).
2. Showcase according to claim 1 comprising a white reflective surface (4) that receives light from the light source (3) and reflects the light towards the display screen (2).
3. Showcase according to any one of the preceding claims, comprising at least a microphone and at least one speaker.
4. Showcase according to any one of the preceding claims, comprising presence detection means that sent a signal upon detecting a person passing in front of the showcase that activates the light source (3) and show the corresponding images in the second zones (6) of the display screen (2).

5. Showcase according to any one of the preceding claims that interacts with the user via NFC, WiFi or Bluetooth.
6. Showcase according to any one of the preceding claims, wherein the display screen (2) is a translucent LCD display screen. 5
7. Showcase according to any one of the preceding claims, wherein a projection on the display screen (2) is employed. 10
8. Showcase according to any one of claims 1 to 5, wherein there are several translucent display screens (2). 15
9. Showcase according to any one of the preceding claims, wherein the central space (1) has rounded corners. 20
10. Showcase according to any of the preceding claims, comprising a touch sensing layer.
11. Showcase according to the preceding claims, where the reflective surface is matt white. 25
12. Showcase according to the preceding claims, comprising a brightness detector.
13. Showcase according to the preceding claims, comprising a mobile platform housed inside and connected with the computer (7). 30

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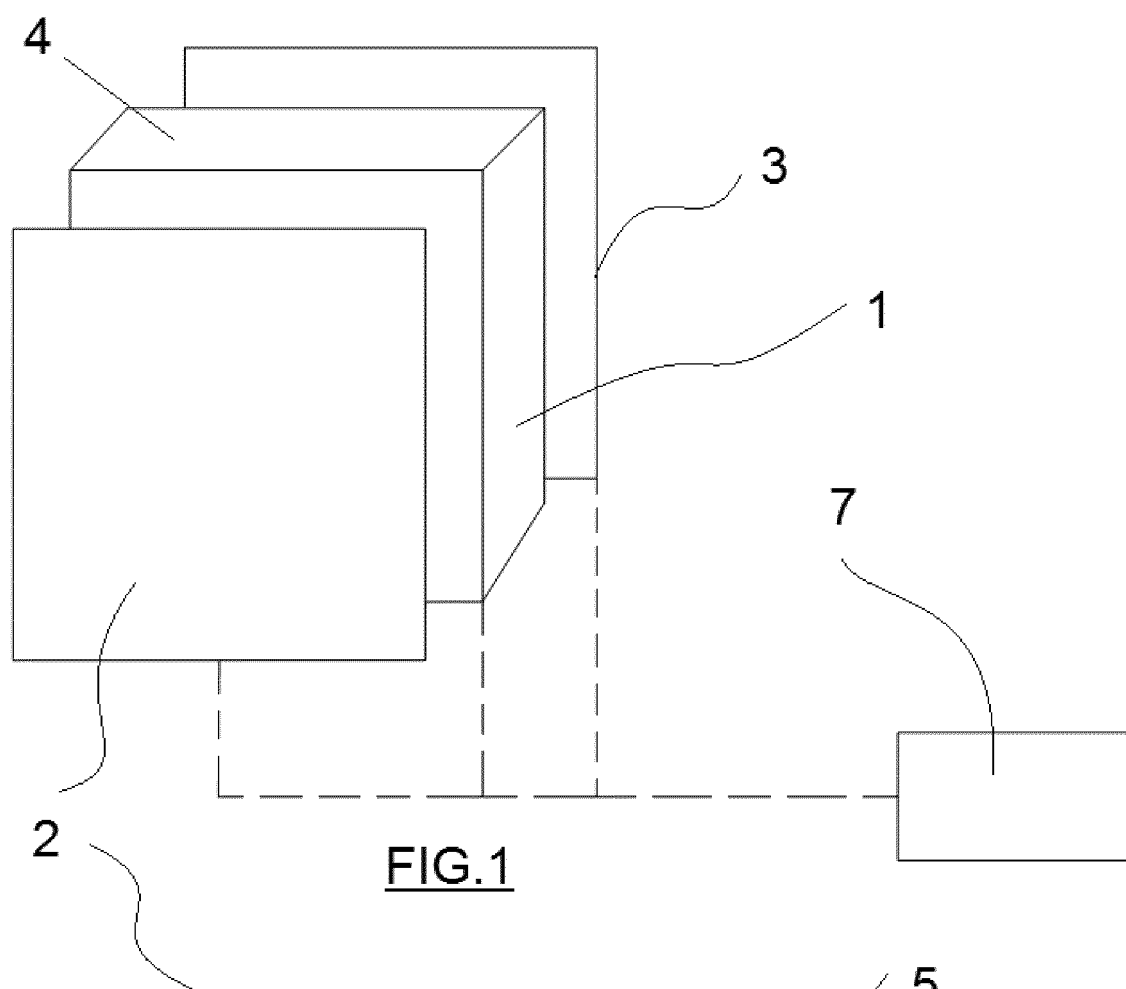


FIG.1

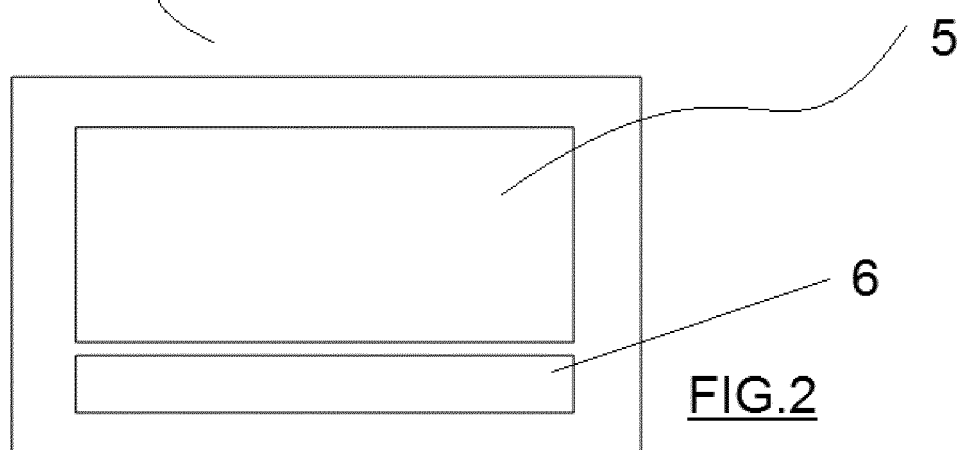
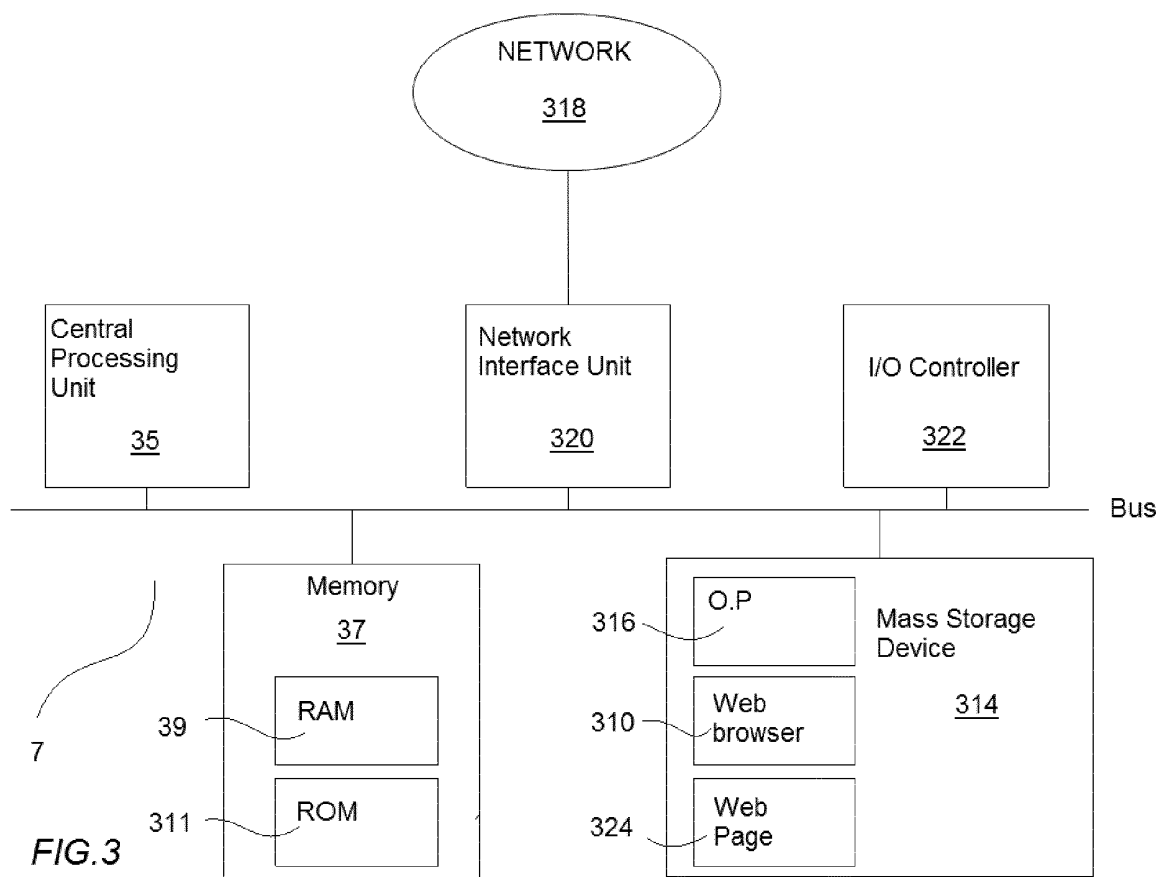


FIG.2



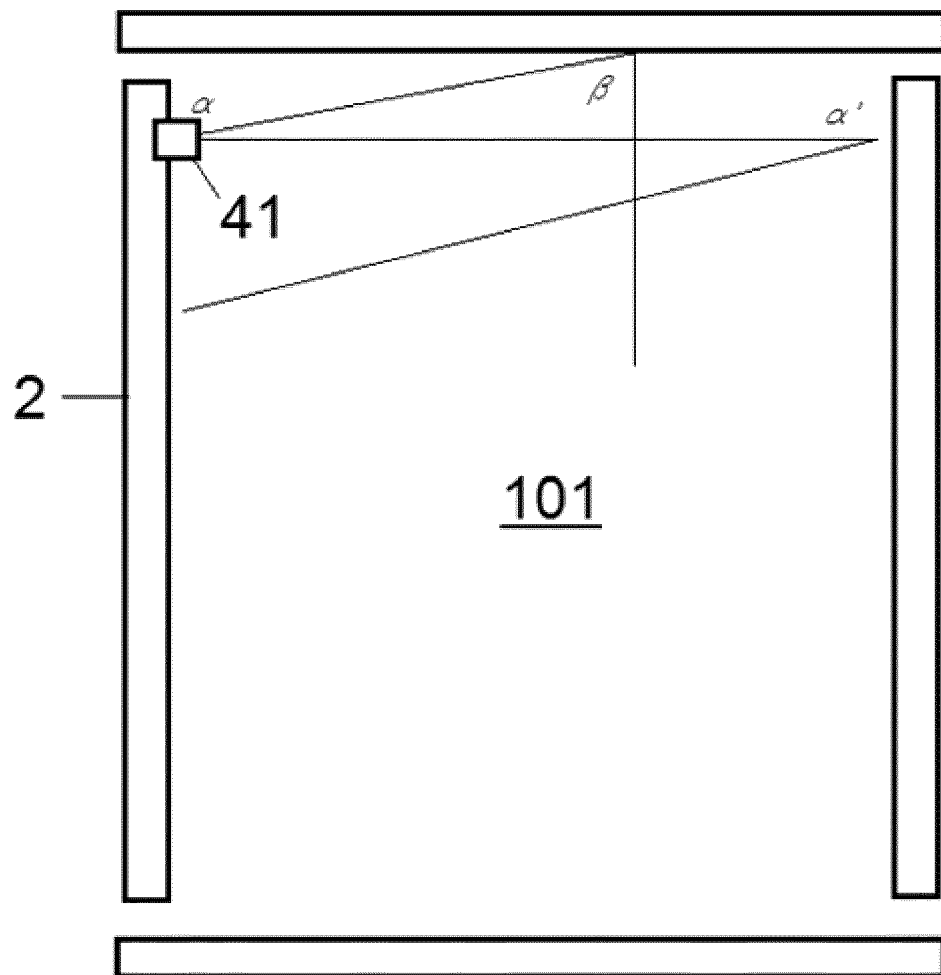


FIG. 4

INTERNATIONAL SEARCH REPORT

International application No.
PCT/ES2013/070706

A. CLASSIFICATION OF SUBJECT MATTER

A47F3/00 (2006.01)

A47F11/10 (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)

A47F

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, INVENES, WPI

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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☒ Further documents are listed in the continuation of Box C.☒ See patent family annex.

* Special categories of cited documents:

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

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

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Date of the actual completion of the international search

24/01/2014

Date of mailing of the international search report

(28/01/2014)

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Form PCT/ISA/210 (second sheet) (July 2009)

INTERNATIONAL SEARCH REPORT

International application No.

PCT/ES2013/070706

C (continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
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INTERNATIONAL SEARCH REPORT

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Information on patent family members

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