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Image displaying system and remote control unit for such a system

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5 The invention relates to an image displaying system, comprising a display device and a remote control unit, said remote control unit comprising a light emitting pointer device and a detector for detecting light emanating from the display device, the pointer device and the detector having corresponding lines of sight, and to a remote control unit for such a system.

10 US-A-5 793 361 discloses an image displaying system of this type wherein the remote control unit or pointing interface may include a narrow beam light source, for example a laser pointer, as light emitting pointer device. The use of a pointer device in a remote control unit increases the power consumption of the remote control unit thereby decreasing battery life of the unit significantly. Moreover, the use of a laser pointer causes safety problems as laser pointers can blind the human eye.

15 US-A-4 687 918 discloses a laser pointer with remote directional activation to be used in a system for pointing out images or the like projected onto a viewing screen. This known laser pointer is only activated when the laser pointer is directed at the viewing screen. To this end optical transmitters are attached to the periphery of the viewing screen and a detector is added to the tip of the laser pointer.

The invention aims to provide an improved image displaying system with remote control unit of the above-mentioned type.

20 According to the invention an image displaying system is provided characterized by a circuit for switching on and off the pointer device in dependence on an output signal of the detector indicating the receipt of light emanating from the display device, wherein the pointer device is switched on if said output signal indicates the receipt of light and is switched off if said output signal indicates that no light is received.

25 In this manner an image displaying system is obtained, wherein the light emanating from the display device is advantageously used to switch on and off the light emitting pointer device of the remote control unit.

The invention further provides a remote control unit for such an image displaying system, comprising a light emanating pointer device and a detector for detecting light emanating from

a display device, the pointer device and the detector having corresponding lines of sight, characterized by a circuit for switching on and off the pointer device in dependence on an output signal of the detector indicating the receipt of light emanating from the display device, wherein the pointer device is switched on if said output signal indicates the receipt of light
5 and is switched off if said output signal indicates that no light is received.

The invention will be further explained by reference to the drawings in which an embodiment of the invention is schematically shown.

Fig. 1 schematically shows a perspective view of an embodiment of the image
10 displaying system and remote control unit according to the invention.

Fig. 2 shows a block diagram of the remote control unit of fig. 1.

Referring to fig. 1 there is shown by way of example a television apparatus 1 as an example of an image displaying system according to the invention. Further example of
15 image displaying devices are a computer system, a multi-screen video wall or the like. The television apparatus 1 comprises a display device 2 which can be made as a CRT for example. The television apparatus 1 further comprises a remote control unit 3 allowing improved control flexibility to the user of the television apparatus 1. The remote control unit 3 comprises a light emitting pointer device 4 schematically shown in a block diagram of the
20 remote control unit 3 in fig. 2. In the embodiment shown, the pointer device 4 is made as a laser pointer providing a narrow light beam 5 shown by a dashed line in fig. 1. A user of the television system 1 can point the remote control unit 3 at an icon presented on the display device 2 in a suitable graphical user interface and can then click the selected icon to activate the corresponding function. The activation of the selected icon can be detected by circuitry
25 of the television system 1 not further shown by means of a detector 6 for detecting light emanating from the display device 2. The emanating light beam is also indicated by the dashed line 5 in fig. 1. As the display device 2 is scanned by a cathode ray, each of the pixels of the display device 2 will emit light during the scanning. The circuitry calculates the x-y co-ordinates of the location at which the remote control unit 3 is pointed by calculating the
30 time between the start of the scanning phase and the moment the detector 6 senses light from the display device 2, i.e. the pixel(s) at which the remote control unit 3 is pointed. As this calculation circuitry is not part of the present invention no further details will be described of this control function of the remote control unit 3.



However, it will be clear that the detector 6 will regularly provide a detection signal output as long as the remote control unit 3 is directed at the display device 2. This means that the detector 6 will provide a detection signal with the repetition rate of the frame frequency of the display device 2, for example 20 ms for PAL and 16.7 ms for NTSC. The output signal of the detector 6 is provided to a circuit 7 for switching on and off the pointer device 4. In the embodiment shown the circuit 7 includes a first circuit 8 and a delay circuit 9 both receiving the output signal of the detector 6. Circuit 8 switches the pointer device on, whereas the delay circuit 9 provides a switch-off signal to the circuit 8 resulting in switching off of the pointer device 4. The delay circuit 9 is a timer providing a delay of for example 62 ms in providing the switch-off signal to the circuit 8 if no output signal is received from the detector 6 anymore. As long as the detector 6 provides a detection output signal at each complete scan of the display device 2, the timer is reset, so that the delay circuit 9 will not provide a switch-off signal.

In this manner the pointer device 4 will be switched off 62 ms after diverting the remote control unit 3 of the display device 2 or if a person comes in between the remote control unit 3 and the display device 2. In this manner it is guaranteed that the light beam of the pointer device 4 will not hit a human or animal eye. Moreover, battery life of the remote control unit 3 will be significantly lengthened.

Switching on of the pointer device 4 is very fast, since the scan cycle time of the display device 2 in case of a television system is 20 ms for PAL and 16.7 ms NTSC. Switching off with a delay of approximately 62 ms allows for errors of missing light radiated by the pixel(s) at which the remote control unit 3 is pointed up to three times and to provide a fast enough response time in switching off the pointer device 4. If desired, the delay time can be made adjustable in any suitable manner.

The invention is not restricted to the above described embodiment which can be varied in a number of ways within the scope of the attached claims.

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CLAIMS:



1. Image displaying system, comprising a display device and a remote control unit, said remote control unit comprising a light emitting pointer device and a detector for detecting light emanating from the display device, the pointer device and the detector having corresponding lines of sight, characterized by a circuit for switching on and off the pointer device in dependence on an output signal of the detector indicating the receipt of light emanating from the display device, wherein the pointer device is switched on if said output signal indicates the receipt of light and is switched off if said output signal indicates that no light is received.
2. System according to claim 1, wherein said switching circuit comprises a delay circuit to delay switching off the pointer device if said output signal indicates that no light is received.
3. System according to claim 2, wherein the delay of the delay circuit is adjustable, preferably in a range from 40-70 msec.
4. Remote control unit for a system according to any one of the preceding claims, comprising a light emitting pointer device and a detector for detecting light emanating from a display device, the pointer device and the detector having corresponding lines of sight, characterized by a circuit for switching on and off the pointer device in dependence on an output signal of the detector indicating the receipt of light emanating from the display device, wherein the pointer device is switched on if said output signal indicates the receipt of light and is switched off if said output signal indicates that no light is received.

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