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(54) **SYSTEMS AND METHODS FOR  
ADJUSTABLE POLARIZATION IN SERVICE  
PROVIDING TERMINALS**

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Jul. 7, 2017.

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7, 2016.

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**G09G 5/14** (2006.01)  
**G02F 1/01** (2006.01)  
**G02F 1/1347** (2006.01)  
**G06F 3/0488** (2013.01)

(52) **U.S. Cl.**

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**3/36** (2013.01); **G09G 5/14** (2013.01); **G06F**

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**G09G 2354/00** (2013.01)

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**9/3167**; **H04N 2201/02493**; **G02B 27/28**;  
**G02B 27/286**

See application file for complete search history.

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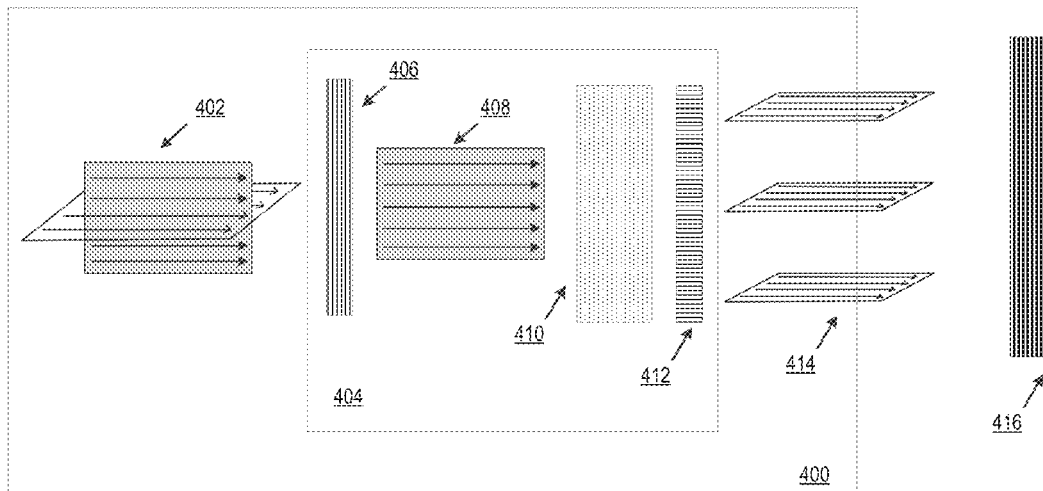
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(57) **ABSTRACT**

The embodiments include systems and methods for adjust-  
able polarization in service-providing terminals. In some  
embodiments, a system may include a display, an input  
device, an adjustable polarization screen adjacent to the  
display, and a polarization adjuster. The system may further  
include a processor configured to execute instructions to  
perform operations comprising providing illumination to the  
adjustable polarization screen through the display, control-  
ling, via the polarization adjuster, a polarization of the  
adjustable polarization screen to a first polarization, receiv-  
ing, via the input device, a polarization selection input, and  
based on the polarization selection input, adjusting, via the  
polarization adjuster, the polarization of the adjustable  
polarization screen from the first polarization to a second  
polarization.

**20 Claims, 10 Drawing Sheets**



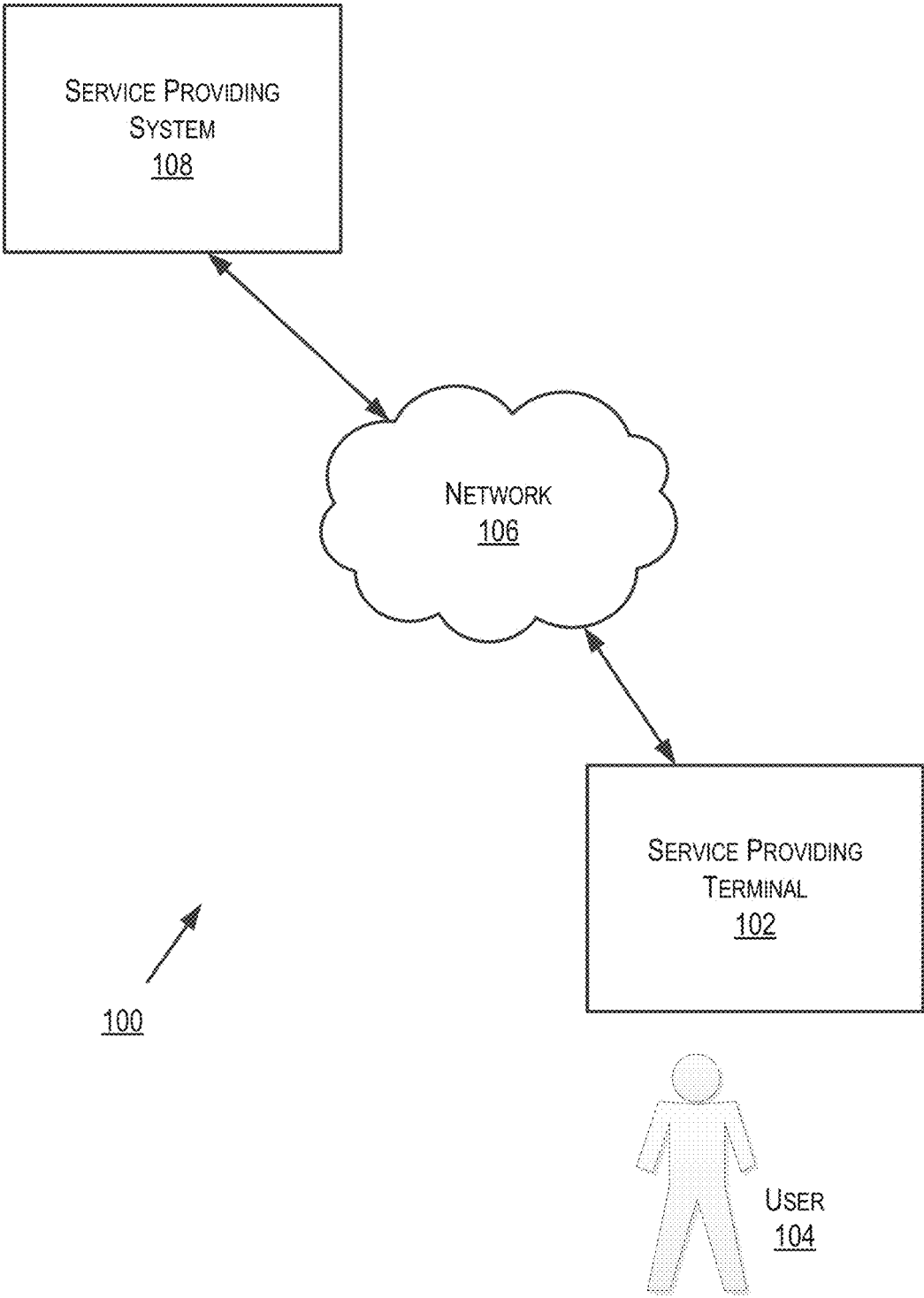


FIGURE 1

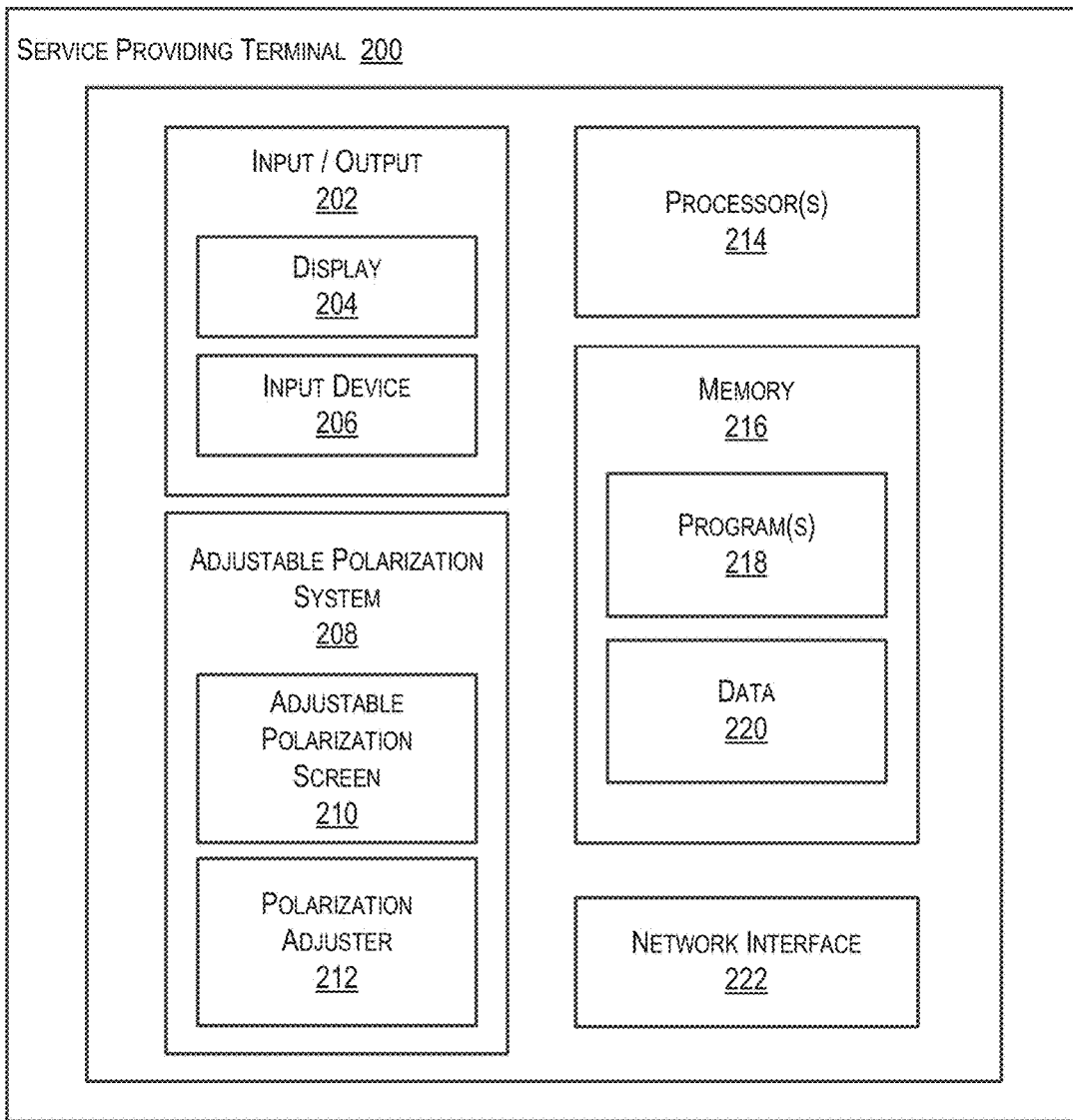


FIGURE 2A

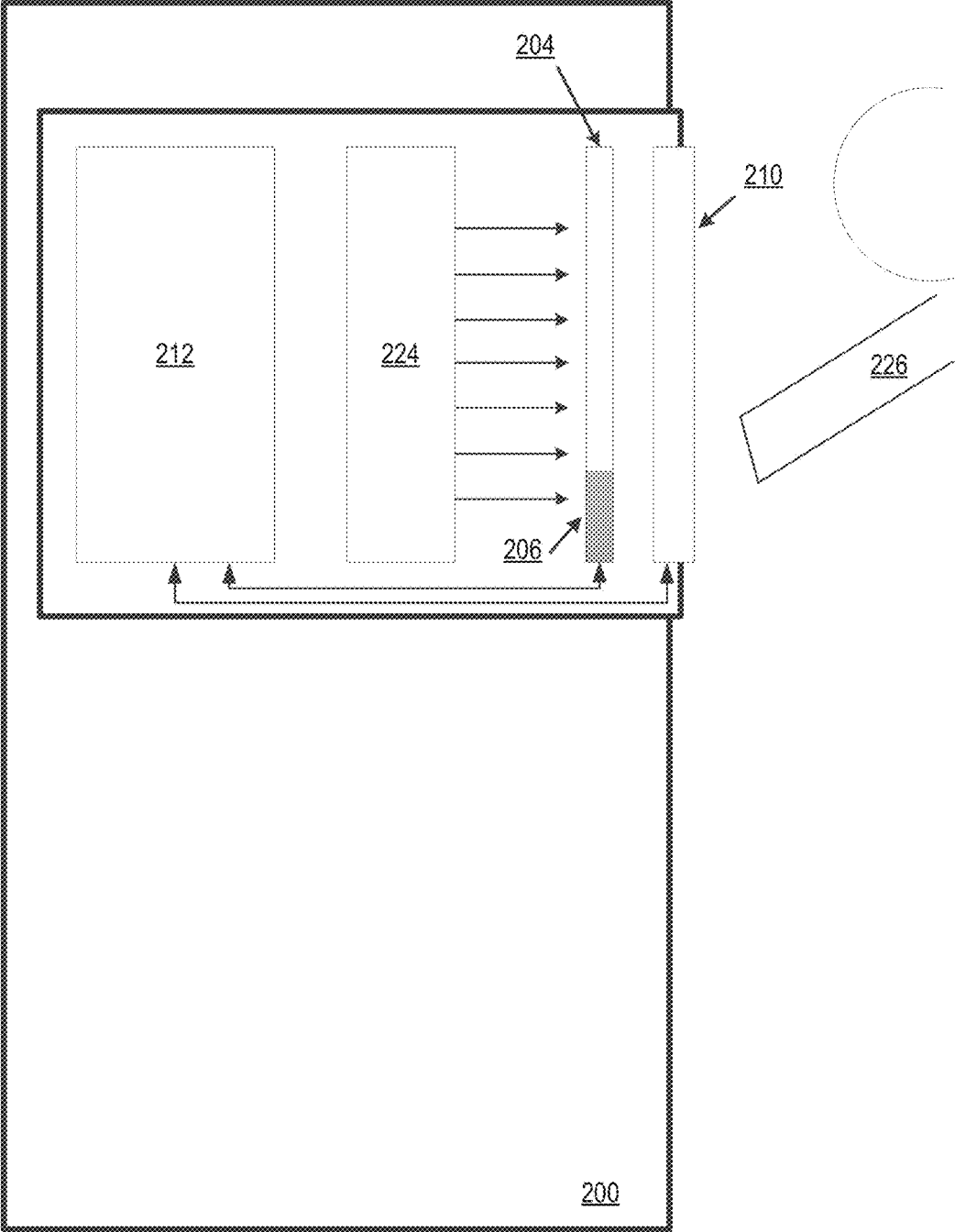


FIGURE 2B

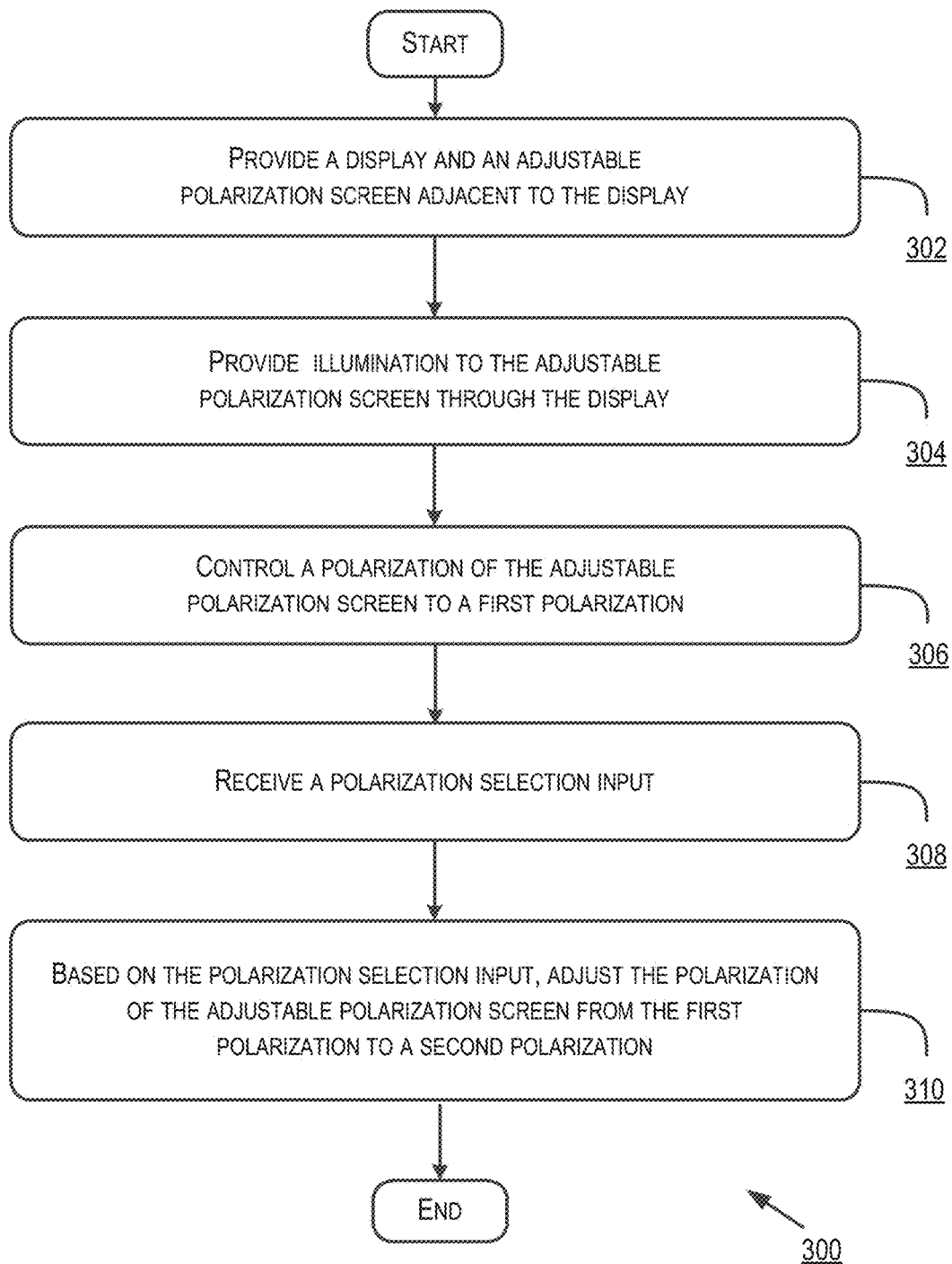


FIGURE 3

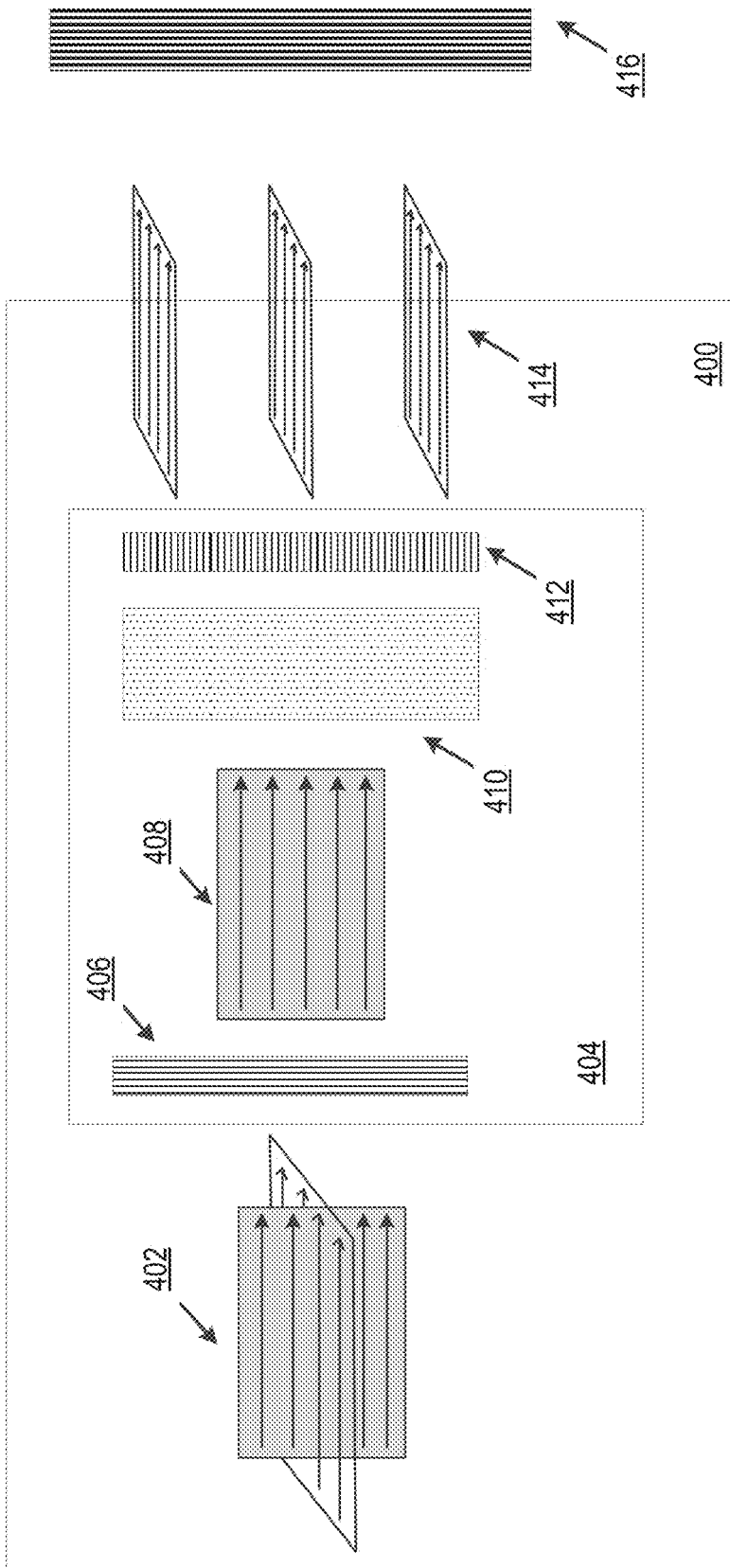


FIGURE 4A



FIGURE 4B

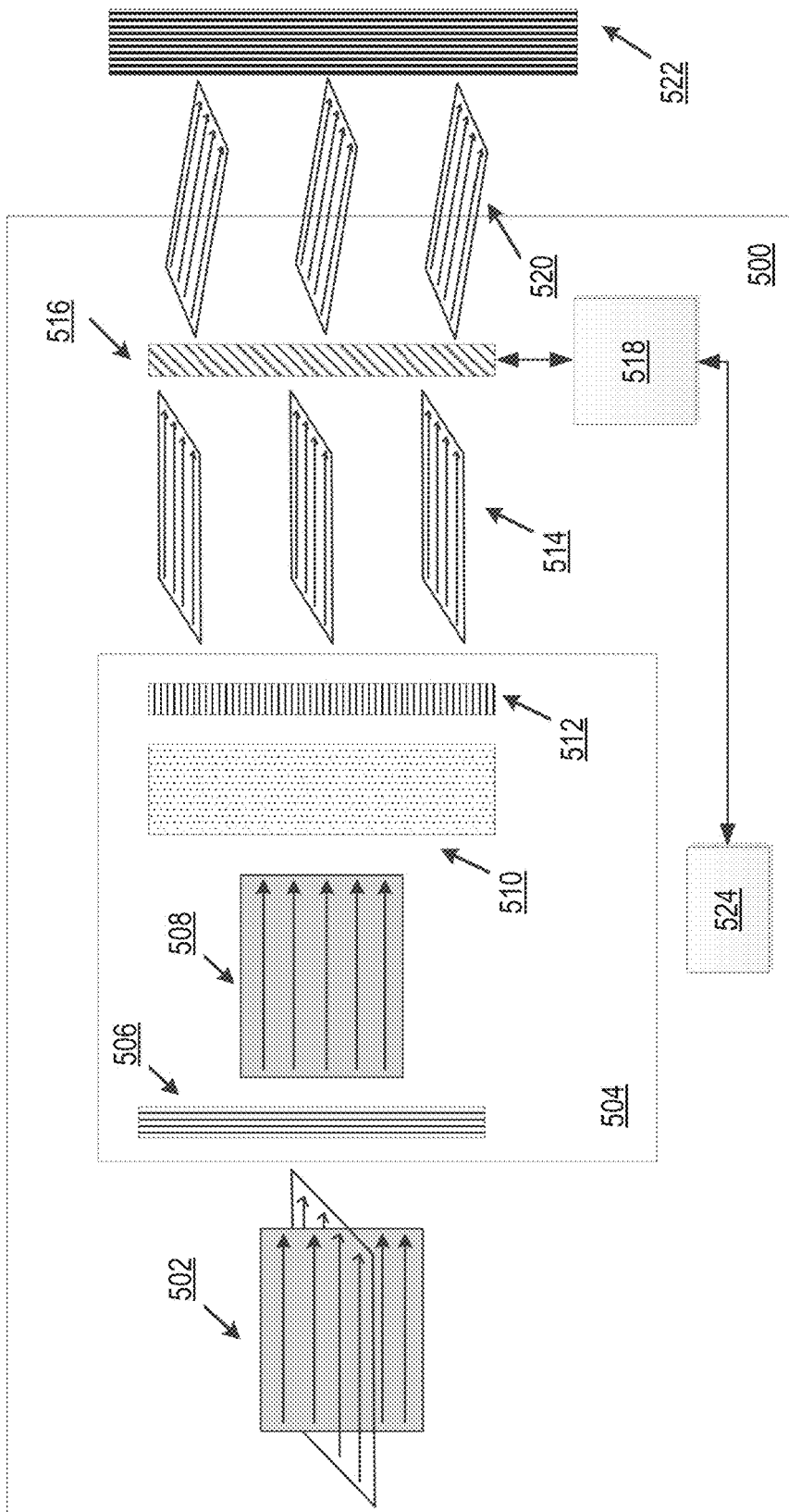


FIGURE 5A



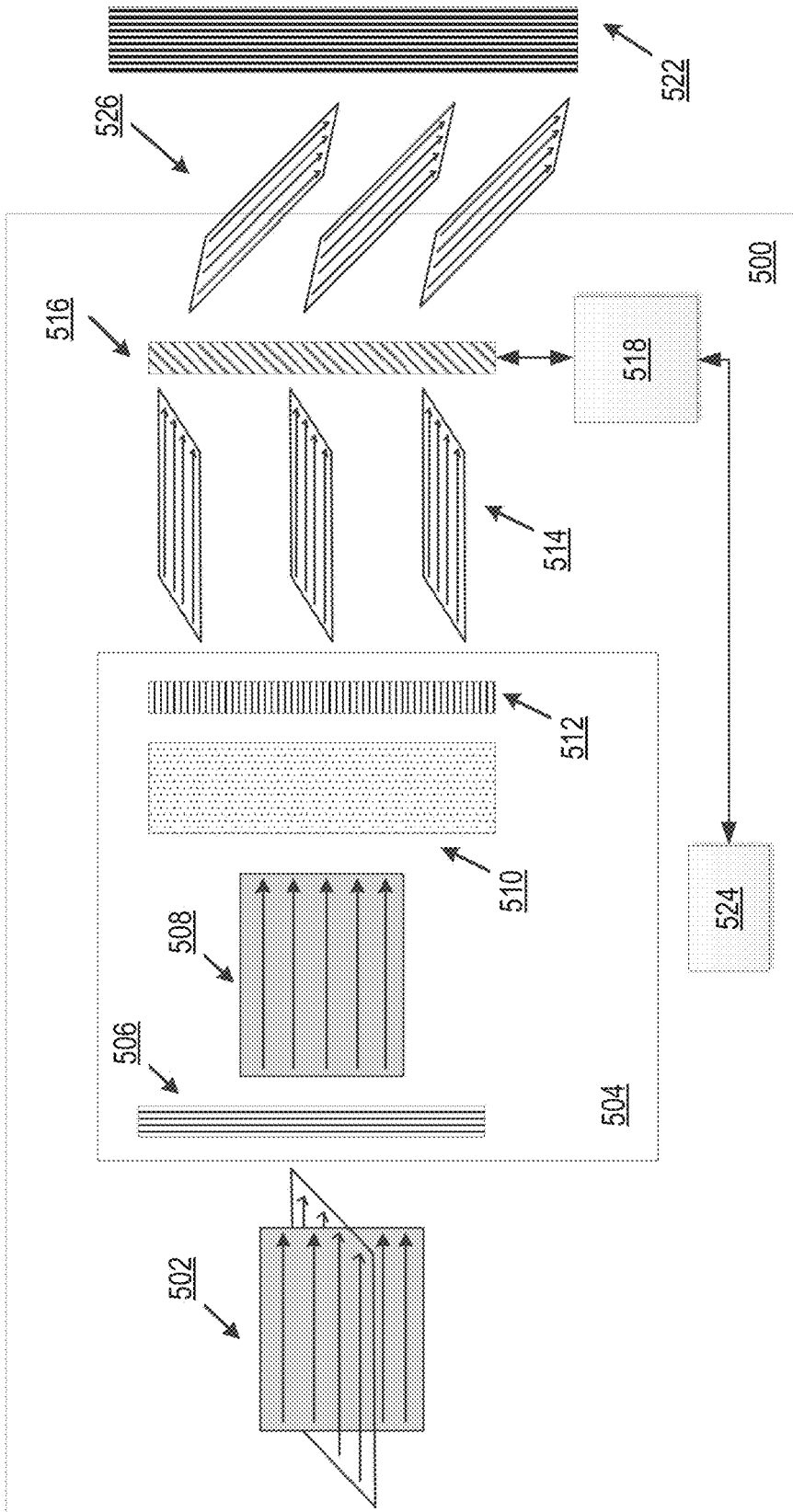


FIGURE 5B



FIGURE 5C



FIGURE 5D

## SYSTEMS AND METHODS FOR ADJUSTABLE POLARIZATION IN SERVICE PROVIDING TERMINALS

This application is a continuation of U.S. patent applica- 5  
tion Ser. No. 15/644,263, filed Jul. 7, 2017, which claims  
priority to U.S. Provisional Application Ser. No. 62/359,368  
filed Jul. 7, 2016. The contents of the above-referenced  
applications are hereby incorporated by reference in their  
entireties. 10

### BACKGROUND

Many service-providing terminals, such as automated 15  
teller machines (ATMs), kiosks, user devices, and other  
terminals, include a cathode ray tube (CRT) or liquid crystal  
display (LCD) display through which a user may interact  
with the service-providing terminal. Information is typically  
displayed on CRT and LCD displays by illuminating the  
display with non-polarized light, which is selectively polar- 20  
ized by the display to create images and/or text representing  
the information.

A user of a service-providing terminal may, in some cases,  
wear polarized eyewear, such as sunglasses. The polariza- 25  
tion of the user's sunglasses and the selectively polarized  
display of the service-providing terminal may destructively  
interfere, making it difficult for the user to view the infor-  
mation displayed on the display.

### SUMMARY

The disclosed embodiments may include systems and  
methods for adjustable polarization in service-providing  
terminals.

In one embodiment, a system is disclosed that includes a 35  
display, an input device, an adjustable polarization screen,  
and a polarization adjuster, where the adjustable polarization  
screen is adjacent to the display. The system further includes  
a memory storing instructions and a processor configured to  
execute the instructions to perform operations. The opera- 40  
tions include providing illumination to the adjustable polar-  
ization screen through the display and controlling, via the  
polarization adjuster, a polarization of the adjustable polar-  
ization screen to a first polarization. The operations further  
include receiving, via the input device, a polarization selec- 45  
tion input and, based on the polarization selection input,  
adjusting, via the polarization adjuster, the polarization of  
the adjustable polarization screen from the first polarization  
to a second polarization.

In another embodiment, a method is disclosed that 50  
includes providing a display and an adjustable polarization  
screen adjacent to the display; providing illumination to the  
adjustable polarization screen through the display; control-  
ling a polarization of the adjustable polarization screen to a  
first polarization; receiving a polarization selection input; 55  
and, based on the polarization selection input, adjusting the  
polarization of the adjustable polarization screen from the  
first polarization to a second polarization.

In yet another embodiment, a non-transitory computer- 60  
readable medium is disclosed storing instructions that, when  
executed by a processor, cause the processor to perform  
operations. The operations include providing a display and  
an adjustable polarization screen adjacent to the display;  
providing illumination to the adjustable polarization screen  
through the display; controlling a polarization of the adjust- 65  
able polarization screen to a first polarization; receiving a  
polarization selection input; and, based on the polarization

selection input, adjusting the polarization of the adjustable  
polarization screen from the first polarization to a second  
polarization.

Aspects of the disclosed embodiments may include tan-  
gible computer-readable media that store software instruc-  
tions that, when executed by one or more processors, are  
configured for and capable of performing and executing one  
or more of the methods, operations, and the like consistent  
with the disclosed embodiments. Also, aspects of the dis-  
closed embodiments may be performed by one or more  
processors that are configured as special-purpose proce- 10  
ssor(s) based on software instructions that are programmed  
with logic and instructions that perform, when executed, one  
or more operations consistent with the disclosed embodi-  
ments.

It is to be understood that both the foregoing general  
description and the following detailed description are exem-  
plary and explanatory only and are not restrictive of the  
disclosed embodiments, as claimed. 15

### BRIEF DESCRIPTION OF THE DRAWINGS

The accompanying drawings, which are incorporated in  
and constitute a part of this specification, illustrate disclosed  
embodiments and, together with the description, serve to  
explain the disclosed embodiments. In the drawings: 25

FIG. 1 is a block diagram of an example system, in  
accordance with disclosed embodiments;

FIGS. 2A-2B illustrate example service-providing termi-  
nals, in accordance with disclosed embodiments;

FIG. 3 is an example flow chart illustrating an adjustable  
polarization method, in accordance with disclosed embodi- 30  
ments;

FIGS. 4A-4B illustrate operation of a service-providing  
terminal that does not include an adjustable polarization  
system; and

FIGS. 5A-5D illustrate operation of a service-providing  
terminal that includes an adjustable polarization system, in  
accordance with disclosed embodiments. 35

### DETAILED DESCRIPTION

Reference will now be made in detail to the disclosed  
embodiments, examples of which are illustrated in the  
accompanying drawings.

FIG. 1 is a block diagram of an example system **100**, in  
accordance with disclosed embodiments. System **100** may  
include a service-providing terminal **102**. While one service-  
providing terminal **102** is shown, it will be understood that  
system **100** may include any number of service-providing  
terminals. 45

Service-providing terminal **102** may be any device con-  
figured for use by a user **104**. In some embodiments,  
service-providing terminal **102** may take the form of, for  
example, a device configured to provide a service to user  
**104**, such as an automated teller machine (ATM), a payment  
or purchase kiosk, an information kiosk, a point-of-sale  
device, or other device. Alternatively or additionally, in  
some embodiments service-providing terminal **102** may take  
the form of a user device, such as a mobile communication  
device, a cellular telephone, a smartphone, a tablet com- 50  
puter, a laptop computer, a desktop computer, or a wearable  
computing device, such as a watch or glasses. Service-  
providing terminal **102** may take other forms as well.  
Service-providing terminal **102** is described in further detail  
below in connection with FIG. 2. 55

In some embodiments, service-providing terminal **102**  
may be configured to communicate over a network **106**.

Network **106** may be any type of network configured to provide communications between service-providing terminal **102** and one or more other entities. For example, network **106** may be any type of network (including infrastructure) that provides communications, exchanges information, and/or facilitates the exchange of information, such as the Internet, a Local Area Network, near field communication (NFC), Bluetooth™, Bluetooth LE™ (BLE), WiFi, or other suitable connection(s) that enables the sending and receiving of information between service-providing terminal **102** and one or more other entities. In other embodiments, service-providing terminal **102** may communicate with one or more other entities through a dedicated communication link(s). Network **106** may take other forms as well.

In some embodiments, service-providing terminal **102** may be configured to communicate, through network **106**, with a service-providing system **108**. Service-providing system **108** may be any system configured to support service-providing terminal **102**. For example, in embodiments where service-providing terminal **102** is an ATM, service-providing system **108** may be a financial service provider system configured to support financial services provided by service-providing terminal **102**. As another example, in embodiments where service-providing terminal **102** is a mobile communication device, service-providing system **108** may be a communication service provider system configured to support communication services provided by service-providing terminal **102**. Service-providing system **108** may take other forms as well.

While one network **106** and one service-providing system **108** are shown, it will be understood that system **100** may include any number of networks and/or service-providing systems. In some embodiments, for example, service-providing terminal **102** may be a stand-alone device, and no network **106** or service-providing system **108** may be included in system **100**. System **100** may take other forms as well.

It is to be understood that the configuration and boundaries of the functional building blocks of system **100** have been defined herein for the convenience of the description. Alternative boundaries can be defined so long as the specified functions and relationships thereof are appropriately performed. Alternatives (including equivalents, extensions, variations, deviations, etc., of those described herein) will be apparent to persons skilled in the relevant art(s) based on the teachings contained herein. Such alternatives fall within the scope and spirit of the disclosed embodiments.

FIG. **2A** is a block diagram illustrating an example service-providing terminal **200**, in accordance with disclosed embodiments. Service-providing terminal **200** may take any of the forms described above for service-providing terminal **102** in connection with FIG. **1**.

As shown, service-providing terminal **200** may include an input/output device **202**. Input/output device **202** may be any device configured to receive inputted information and/or provide outputted information. In some embodiments, input/output device **202** may be configured to receive inputted information from and/or provide outputted information to a user of service-providing terminal **200**.

In some embodiments, input/output device **202** may include a display **204**. Display **204** may be any device configured to provide outputted information. In some embodiments, display **204** may take the form of one or more of a liquid crystal display (LCD), a cathode ray tube (CRT) display, a plasma display, a light-emitting diode (LED) display, or an organic LED (OLED) display. Display **204** may take other forms as well.

In some embodiments, display **204** may be configured to display information by selectively polarizing non-polarized light provided to display **204**. For example, display **204** may comprise a number of pixels, each of which includes a layer of liquid crystal between two polarizing filters. The liquid crystal may be configured to change orientation based on a provided voltage, and the changed orientation may cause a change in polarization. In this manner, by controlling a voltage provided to each pixel, display **204** may control the orientation of the liquid crystals in each pixel, thereby selectively polarizing the non-polarized light. Other polarization methods may be used to alter a viewing angle or visibility of display **204**. Operation of display **204** is further described below in connection with FIGS. **4A-4B** and **5A-5D**.

In some embodiments, input/output device **202** may include an input device **206**. Input device **206** may be any device configured to receive inputted information. In some embodiments, input device **206** may take the form of a mechanical input, such as a button, knob, or lever. Alternatively or additionally, in some embodiments input device **206** may take the form of an electrical input, such as a capacitive, resistive, or optical input. For example, input device **206** may take the form of an infrared input configured to detect movement of a user's hand(s). In some embodiments, input device **206** may take the form of a touch screen, and display **204** may be and/or may include the touch screen. Input device **206** may take other appropriate forms to enable information input by the user.

Service provider terminal **200** may further include an adjustable polarization system **208**, which may include an adjustable polarization screen **210** and a polarization adjuster **212**. Adjustable polarization screen **210** may be any screen configured to modify a polarization of illumination provided to the adjustable polarization screen **210**. In some embodiments, adjustable polarization screen **210** may be similar to an LCD display. Adjustable polarization screen **210** may take other forms as well. In some embodiments, part or all of adjustable polarization system **208** may be built into display **204**.

Adjustable polarization screen **210** may be configured such that a polarization of adjustable polarization screen **210** may be controlled by controlling a voltage provided to adjustable polarization screen **210**. In some embodiments, for example, adjustable polarization screen **210** may comprise a number of pixels, each of which includes a layer of liquid crystal between two polarizing filters. The liquid crystal may be configured to change orientation based on a provided voltage, and the changed orientation may cause a change in polarization. In this manner, by controlling a voltage provided to adjustable polarization screen **210**, the orientation of the liquid crystals may be adjusted, thereby adjusting polarization of adjustable polarization screen **210**. Operation of adjustable polarization screen **210** is further described below in connection with FIGS. **4A-4B** and **5A-5D**.

Polarization adjuster **212** may be configured to control the polarization of adjustable polarization screen **210**. In some embodiments, polarization adjuster **212** may be configured to control a polarization of adjustable polarization screen **210** to any value between and including  $0^\circ$  and  $90^\circ$ . In some embodiments, for example, polarization adjuster **212** may be configured to control a polarization of adjustable polarization screen **210** to a first polarization between and including  $0^\circ$  and  $90^\circ$ . Further, polarization adjuster **212** may be configured to adjust the polarization of adjustable polarization screen **210** from the first polarization to a second

polarization between and including 0° and 90°. The second polarization may be different from the first polarization. Further, the second polarization may be non-orthogonal to the first polarization. Other polarizations are possible as well.

In some embodiments, polarization adjuster 212 may include a driver configured to control a voltage provided to adjustable polarization screen 210. The polarization adjuster 212 may be configured to control the adjustable polarization screen 210 to the first polarization by, for example, controlling the voltage provided to the adjustable polarization screen 210 to a first voltage. Further, the polarization adjuster 212 may be configured to adjust the adjustable polarization screen 210 from the first polarization to the second polarization by, for example, controlling the voltage provided to adjustable polarization screen 210 from the first voltage to a second voltage.

In some embodiments, input device 206 may be configured to receive a polarization selection input. For example, a user of service-providing terminal 200 may use input device 206 to select a polarization. In some embodiments, the user may select a polarization by adjusting an appearance of display 204, such as a “brightness” or “contrast.” For example, the user may use input device 206 to increase or decrease the “brightness” or “contrast” of display 204. As still another example, the polarization selection input may be pre-defined for a user, and a user may select the polarization by, for instance, providing identification of the user. The polarization selection input may take other forms as well.

In some embodiments, polarization adjuster 212 may adjust the polarization of adjustable polarization screen 210 as the polarization selection input is received. For example, as a user gradually adjusts a “brightness” or “contrast” of display 204 using input device 206, polarization adjuster 212 may gradually adjust the polarization of adjustable polarization screen 210, thereby adjusting a “brightness” or “contrast” of display 204. Alternatively, in some embodiments, polarization adjuster 212 may adjust the polarization of adjustable polarization screen 210 after the polarization selection input is received. For example, as a user may select an increase in “brightness” or “contrast” of display 204 using input device 206, and, upon receiving the polarization selection input, polarization adjuster 212 may adjust the polarization of adjustable polarization screen 210, thereby increasing the “brightness” or “contrast” of display 204. The polarization selection input may take other forms as well.

Processor(s) 214 may include one or more known single or multicore processing devices, such as a microprocessor from the Pentium™ or Xeon™ family manufactured by Intel™, the Turion™ family manufactured by AMD™, or any of various processors manufactured by Sun Microsystems, for example. The disclosed embodiments are not limited to any type of processor(s) otherwise configured to meet the computing demands of different components of service-providing terminal 200.

Memory 216 may include one or more storage devices configured to store instructions used by processor(s) 214 to perform functions related to disclosed embodiments. For example, memory 216 may be configured to store software instructions, such as program(s) 218, that may cause processor(s) 214 to perform one or more operations consistent with disclosed embodiments. The disclosed embodiments are not limited to separate programs or computers configured to perform dedicated tasks. For example, memory 216 may store a single program 218 that performs the functions of service-providing terminal 200, or program(s) 218 may

comprise multiple programs. Memory 216 may also store data 220 that is used by program(s) 218.

In certain embodiments, memory 216 may store sets of instructions for carrying out the processes described below in connection with FIG. 3. Other instructions are possible as well. In general, instructions may be executed by processor(s) 214 to perform one or more processes consistent with disclosed embodiments.

The components of service-providing terminal 200 may be implemented as hardware, software, or a combination of both hardware and software, as will be apparent to those skilled in the art. For example, although one or more components of service-providing terminal 200 may be implemented as computer processing instructions, all or a portion of the functionality of service-providing terminal 200 may be implemented instead in dedicated electronics hardware.

It will be understood that service-providing terminal 200 may include more, fewer, or different components than those shown. In some embodiments, service-providing terminal 200 may include additional components associated with a service provided by terminal 200. Service-providing terminal 200 may take other forms as well.

In some embodiments, service-providing terminal 200 may be configured to communicate, through a network, with one or more entities. For example, service-providing terminal 200 may be configured to communicate through a network, such as network 106 described above in connection with FIG. 1, with a service-providing system, such as service-providing system 108. In some embodiments, service-providing terminal 200 may include a network interface 222. Network interface 222 may include, for example, one or more digital and/or analog devices that allow network interface 222 to communicate with and/or detect other components, such as a network controller and/or wireless adaptor for communicating over the Internet. Network interface 222 may take other forms as well.

FIG. 2B is an illustration of another service-providing terminal 200, in accordance with disclosed embodiments. While service-providing terminal 200 is shown, for purposes of illustration, to take a certain form, it will be understood that service-providing terminal 200 may take other forms as well.

As shown, service-providing terminal 200 may include display 204 and input device 206, as described above. Further, as shown, service-providing terminal 200 may include adjustable polarization screen 210. Adjustable polarization screen 210 may be adjacent to display 204, as shown. Alternatively or additionally, adjustable polarization screen 210 may be near, next to, in proximity to, or within a range of display 204. Other positioning of adjustable polarization screen 210 and display 204 are possible as well.

In some embodiments, service-providing terminal 200 may further include illumination source 224 configured to provide illumination to display 204. In some embodiments, illumination source 224 may be configured to provide non-polarized light to display 204. For example, illumination source 224 may provide non-polarized light as backlight to display 204. Display 204 may be configured to selectively polarize the non-polarized light and provide the selectively polarized light to adjustable polarization screen 210. In some embodiments, illumination source 224 may be built into display 204.

Service-providing terminal 200 may further include polarization adjuster 212. In some embodiments, polarization adjuster 212 may be communicatively coupled to input device 206 and adjustable polarization screen 210. Polar-

ization adjuster **212** may be configured to control a polarization of adjustable polarization screen **210** to, for example, a first polarization by, for example, controlling a voltage provided to adjustable polarization screen **210** to a first voltage, thereby controlling an orientation of liquid crystals within pixels of adjustable polarization screen **210**.

Further, in some embodiments, input device **206** may be configured receive a polarization selection input from, for example, user **226**. Based on the polarization selection input, polarization adjuster **212** may be further configured to adjust a polarization of adjustable polarization screen **210** from, for example, the first polarization to a second polarization by, for example, controlling the voltage provided to adjustable polarization screen **210** from the first voltage to a second voltage, thereby adjusting the orientation of the liquid crystals within the pixels of adjustable polarization screen **210**. Service-providing terminal **200** may take other forms as well.

FIG. 3 is an example flow chart illustrating an adjustable polarization method **300**, in accordance with disclosed embodiments. As shown, method **300** may begin at step **302** with providing a display and an adjustable polarization screen adjacent to the display. The display and the adjustable polarization screen may, for example, take any of the forms described above for display **204** and adjustable polarization screen **210**, respectively, in connection with FIGS. 2A-2B.

The method **300** may continue at step **304** with providing illumination to the adjustable polarization screen through the display. In some embodiments, providing illumination to the adjustable polarization screen through the display may involve providing non-polarized light to the display. The display may be configured to selectively polarize the non-polarized light and provide the selectively polarized light to the adjustable polarization screen. The illumination may be provided in other manners as well.

The method **300** may continue at step **306** with controlling a polarization of the adjustable polarization screen to a first polarization. In some embodiments, the polarization of the adjustable polarization screen may be controlled by a polarization adjuster, such as polarization adjuster **212** described above in connection with FIGS. 2A-2B. Alternatively or additionally, in some embodiments controlling the polarization of the adjustable polarization screen to the first polarization may involve controlling a voltage provided to the adjustable polarization screen. The polarization may be controlled in other manners as well.

The method **300** may continue at step **308** with receiving a polarization selection input. The polarization selection input may be received from, for example, a user. In some embodiments, the polarization selection input may be received via an input device, such as input device **206** described above in connection with FIGS. 2A-2B. In some embodiments, the display may be or may include a touch screen, and receiving the polarization selection input may involve receiving the polarization selection input through the touch screen. The polarization selection input may be received in other manners as well.

The method **300** may continue at step **310** with, based on the polarization selection input, adjusting the polarization of the adjustable polarization screen from the first polarization to a second polarization. In some embodiments, the polarization of the adjustable polarization screen may be adjusted by a polarization adjuster, such as polarization adjuster **212** described above in connection with FIGS. 2A-2B. Alternatively or additionally, in some embodiments adjusting the polarization of the adjustable polarization screen from the first polarization to the second polarization may involve

adjusting a voltage provided to the adjustable polarization screen from a first voltage to a second voltage. In some embodiments, the second polarization may be non-orthogonal to the first polarization.

Method **300** may include more or fewer steps than those shown and, in some embodiments, an order of one or more of steps **302-310** may vary.

FIGS. 4A-4B illustrate operation of a service-providing terminal **400** that does not include an adjustable polarization system. As shown, service-providing terminal **400** may be configured to provide illumination **402** to a display **404**. Illumination **402** may be, for example, non-polarized illumination.

Display **404** may include a first polarization filter **406**. When non-polarized illumination **402** passes through the first polarization filter **406**, non-polarized illumination **402** may be polarized, resulting in polarized illumination **408**. Polarized illumination **408** may be passed through liquid crystals **410**. Liquid crystals **410** may be, for example, selectively oriented to provide information on display **404**. When polarized illumination **408** is passed through liquid crystals **410** and a second polarization filter **412**, polarized illumination **408** may be selectively polarized to produce selectively polarized illumination **414**.

When selectively polarized illumination **414** is viewed by a user through a polarized lens **416**, the polarizations of the polarized lens **416** and the selectively polarized illumination **414** may destructively interfere, making it difficult for the user to view the information displayed on the display **404**, as illustrated in FIG. 4B.

FIGS. 5A-5D illustrate operation of a service-providing terminal **500** that includes an adjustable polarization system, in accordance with disclosed embodiments. Like display **404** described in connection with FIG. 4A, display **504** may include a first polarization filter **506** through which non-polarized illumination **502** may pass, resulting in polarized illumination **508**. When polarized illumination **508** is passed through liquid crystals **510** and second polarization filter **512**, polarized illumination **508** may be selectively polarized to produce selectively polarized illumination **514**.

Display terminal **500** may further include an adjustable polarization system, which may include an adjustable polarization screen **516** and a polarization adjuster **518** configured to control a polarization of the adjustable polarization screen **516**. The selectively polarized illumination **514** may pass through the adjustable polarization screen **516** before being viewed by a user through a polarized lens **522**. Adjustable polarization screen **516** may have, for example, a first polarization, resulting in first selectively polarized illumination **520**.

In some cases, when first selectively polarized illumination **520** is viewed by a user through a polarized lens **522**, the polarizations of the polarized lens **522** and the first selectively polarized illumination **520** may destructively interfere, making it difficult for the user to view the information displayed on the display **504**, as illustrated in FIG. 5C. Use of the adjustable polarization system, however, may enable the user to adjust a polarization of the adjustable polarization screen **516** to improve the user's ability to view the information displayed on the display **504**.

As shown in FIG. 5B, for example, a user may adjust a polarization of the adjustable polarization screen **504** from the first polarization to a second polarization. To this end, the user may, for example, provide a polarization selection input to an input device **524** at service-providing terminal **500**. For

example, the user may select to increase a “brightness” or “contrast” of display 504. Other polarization selection inputs are possible as well.

Based on the polarization selection input, the polarization adjuster 518 may adjust the polarization of the adjustable polarization screen 516 from the first polarization to a second polarization, as shown, by, for example, adjusting a voltage provided to the adjustable polarization screen 516. The second polarization may be non-orthogonal to the first polarization.

When selectively polarized illumination 514 passes through the adjustable polarization filter 516, second selectively polarized illumination 526 may result. Second selectively polarized illumination 526 may have a different polarization than first selectively polarized illumination 520. In some cases, when second selectively polarized illumination 526 is viewed by the user through a polarized lens 522, the polarizations of the polarized lens 522 and the second selectively polarized illumination 526 may not destructively interfere or may destructively interfere less, making it easier for the user to view the information displayed on the display 504, as illustrated in FIG. 5D. In this manner, the adjustable polarization system may enable the user to adjust a polarization of the adjustable polarization screen 516 to improve the user’s ability to view the information displayed on the display 504.

In some examples, some or all of the logic for the above-described techniques may be implemented as a computer program or application or as a plug-in module or subcomponent of another application. The described techniques may be varied and are not limited to the examples or descriptions provided.

Moreover, while illustrative embodiments have been described herein, the scope thereof includes any and all embodiments having equivalent elements, modifications, omissions, combinations (e.g., of aspects across various embodiments), adaptations and/or alterations as would be appreciated by those in the art based on the present disclosure. For example, the number and orientation of components shown in the exemplary systems may be modified. Further, with respect to the exemplary methods illustrated in the attached drawings, the order and sequence of steps may be modified, and steps may be added or deleted.

Thus, the foregoing description has been presented for purposes of illustration only. It is not exhaustive and is not limiting to the precise forms or embodiments disclosed. Modifications and adaptations will be apparent to those skilled in the art from consideration of the specification and practice of the disclosed embodiments.

The claims are to be interpreted broadly based on the language employed in the claims and not limited to examples described in the present specification, which are to be construed as non-exclusive. Further, the steps of the disclosed methods may be modified in any manner, including by reordering steps and/or inserting or deleting steps.

Furthermore, although aspects of the disclosed embodiments are described as being associated with data stored in memory and other tangible computer-readable storage mediums, one skilled in the art will appreciate that these aspects can also be stored on and executed from many types of tangible computer-readable media, such as secondary storage devices, like hard disks, floppy disks, or CD-ROM, or other forms of RAM or ROM. Accordingly, the disclosed embodiments are not limited to the above described examples, but instead is defined by the appended claims in light of their full scope of equivalents.

The invention claimed is:

1. A system, comprising:

a display;  
 an illumination source;  
 a polarization adjuster;  
 an adjustable polarization screen adjacent to the display configured to receive a plurality of voltages, wherein each of the plurality of voltages corresponds to one of a plurality of crystal orientations;  
 a memory storing instructions; and  
 a processor, wherein the processor is embedded in an automated teller machine, configured to execute the instructions to perform operations comprising:  
 providing, via the illumination source, illumination to the adjustable polarization screen through the display;  
 providing, via the polarization adjuster, a first voltage to the adjustable polarization screen for orienting one or more crystals of the adjustable polarization screen according to a first orientation, wherein the first orientation corresponds to a first polarization;  
 determining an identity of a user;  
 determining a polarization selection based on the identity of the user, the polarization selection being pre-defined for the user and corresponding to a second voltage; and  
 providing the second voltage to the adjustable polarization screen for adjusting the orientation of the one or more crystals of the adjustable polarization screen from the first orientation to a second orientation, wherein the second orientation corresponds to a second polarization.

2. The system of claim 1, comprising a user device.

3. The system of claim 1, wherein the display comprises a liquid crystal display.

4. The system of claim 1, wherein the adjustable polarization screen comprises a liquid crystal display.

5. The system of claim 1, wherein the display comprises a touch screen.

6. The system of claim 1, wherein:

providing illumination to the adjustable polarization screen through the display comprises providing non-polarized light to the display; and

the display is configured to selectively polarize the non-polarized light and provide the selectively polarized light to the adjustable polarization screen.

7. The system of claim 1, wherein the polarization adjuster comprises a driver configured to provide an adjustable voltage to the adjustable polarization screen.

8. The system of claim 1, wherein the second polarization is non-orthogonal to the first polarization.

9. The system of claim 1, wherein determining the polarization selection based on the identity of the user is further based on a characteristic associated with the identified user.

10. The system of 1, wherein determining the identity of the user is further based on an image of the user.

11. The system of claim 10, the operations further comprising:

determining the polarization selection based on the identity of the user by determining that the image depicts a characteristic; and

adjusting the orientation of the one or more crystals of the adjustable polarization screen further based on a pre-defined polarization setting associated with the characteristic.

12. The system of claim 11, wherein the characteristic is the user wearing sunglasses; and the pre-defined polarization setting is pre-defined for users wearing sunglasses.



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13. A method comprising:  
 providing, via an illumination source, illumination to an adjustable polarization screen through a display, wherein the display is on an automated teller machine;  
 providing, via the polarization adjuster, a first voltage to the adjustable polarization screen for orienting one or more crystals of the adjustable polarization screen according to a first orientation, wherein the first orientation corresponds to a first polarization;  
 determining an identity of the user;  
 determining a polarization selection input based on the identity of the user, the polarization selection input being pre-defined for the user and corresponding to a second voltage; and  
 providing the second voltage to the adjustable polarization screen for adjusting the orientation of the one or more crystals of the adjustable polarization screen from the first orientation to a second orientation, wherein the second orientation corresponds to a second polarization.  
 14. The method of claim 13, wherein:  
 the illumination source is configured to provide non-polarized light to the display;  
 the display is configured to selectively polarize the non-polarized light and provide the selectively polarized light to the adjustable polarization screen.  
 15. The method of claim 13, where in the polarization adjuster comprises a driver configured to provide an adjustable voltage to the adjustable polarization screen.  
 16. The method of claim 13, wherein the second polarization is non-orthogonal to the first polarization.  
 17. The method of claim 13, further comprising:  
 determining the polarization selection based on the identity of the user by determining that an image depicts a characteristic; and

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adjusting the polarization selection is further based on a pre-defined polarization setting associated with the characteristic.  
 18. A non-transitory computer-readable medium storing instructions that, when executed by a processor, cause the processor to perform operations comprising:  
 providing, via an illumination source, illumination to an adjustable polarization screen through a display;  
 providing, via the polarization adjuster, a first voltage to the adjustable polarization screen for orienting one or more crystals of the adjustable polarization screen according to a first orientation, wherein the first orientation corresponds to a first polarization;  
 determining an identity of the user;  
 determining a polarization selection input based on the identity of the user, the polarization selection being pre-defined for the user and corresponding to a second voltage; and  
 providing the second voltage to the adjustable polarization screen for adjusting the orientation of the one or more crystals of the adjustable polarization screen from the first orientation to a second orientation, wherein the second orientation corresponds to a second polarization,  
 wherein the non-transitory computer-readable medium is embedded within an automated teller machine.  
 19. The non-transitory computer-readable medium of claim 18, wherein:  
 the illumination source is configured to provide non-polarized light to the display;  
 the display is configured to selectively polarize the non-polarized light and provide the selectively polarized light to the adjustable polarization screen.  
 20. The non-transitory computer-readable medium of claim 18, wherein the display comprises a liquid crystal display.

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