

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
31.08.2011 Bulletin 2011/35

(51) Int Cl.: **E05F 15/20** (2006.01) **E06B 9/68** (2006.01)

(21) Application number: **11154843.4**

(22) Date of filing: 17.02.2011

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB
GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO
PL PT RO RS SE SI SK SM TR
 Designated Extension States:
BA ME

(71) Applicant: **VKR Holding A/S**
2970 Hørsholm (DK)

(72) Inventor: **Ebbe, Ulrik Vagn**
2670 Greve (DK)

(30) Priority: **21.02.2010 DK 201000144**

(54) **Screening device control**

(57) A screening device controller using sensor data to control a screening to provide privacy, comfort and security. The controller is configured to interrupt the con-

tol in accordance with a defined temporal interruption scheme. A method, device and software product is provided.

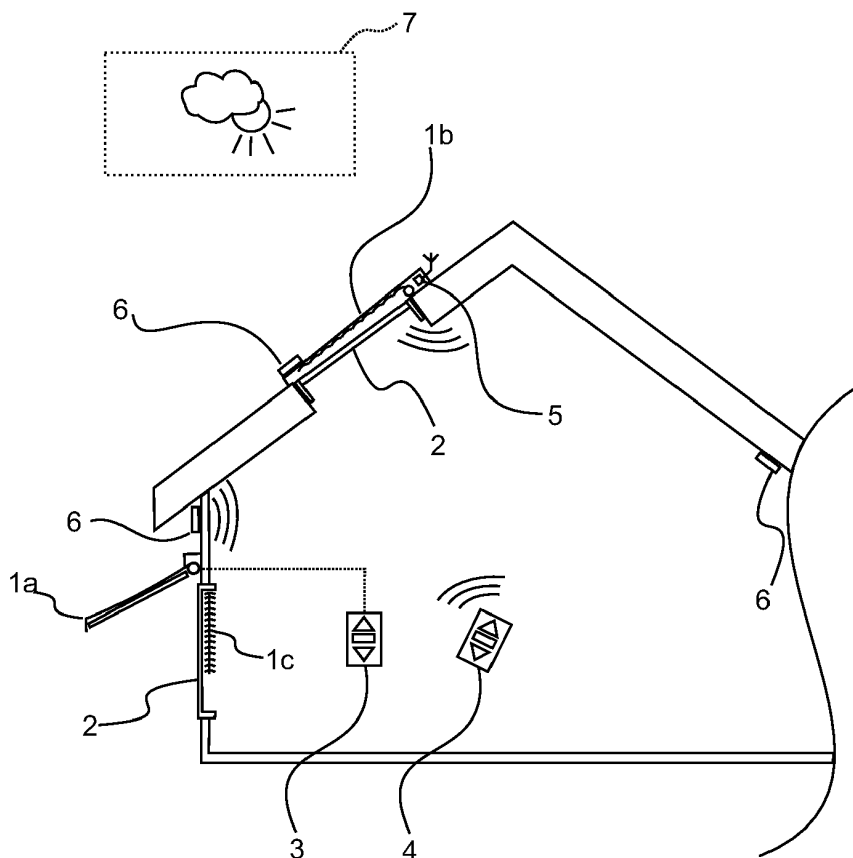


Fig. 1

Description

Field

[0001] The exemplary and non-limiting embodiments of this invention relate generally to control of a screening device and more particularly to interruption of the controller.

Background

[0002] Buildings, windows and doors may use screening means like awnings, roller shutters, shades, blinds and other screening devices etc. Such screening devices may be motor driven and controlled based on sensor values.

[0003] For example DE202006009694U shows a screening controller with a selector switch (531) for selecting the operation mode of the controller (fig. 2).

Summary

[0004] Controllers which control the operation of a screening device based on climate sensors are unpredictable and consequently have not been so widely adopted. A user can never predict when the screening will be operated and this is a drawback with regard to comfort, privacy and security etc.

[0005] It would be desirable to provide screening device control which enhances the user comfort, privacy and security and further provides easy and sensible interruption of the operation of the controller.

[0006] Further it would be desirable to provide a screening device control which automatically resumes the operation so a user does not forget to enable the operation. A screening device may further be controlled to reduce the heat gain or heat loss (e.g. energy savings) and if a user forgets to enable the control of the screening device the result is energy loss and reduction of the thermal comfort. Likewise the security may be reduced if a user forgets to enable the screening control.

[0007] The user comfort may be disturbed by the noise generated by the motor driven screening device. It would be desirable to provide a user friendly and intuitive way to provide enhanced user comfort.

[0008] It is desirable that the controller controls the screening in a stable and logical manner even though the sensor measurements, manual user operations and controller interruptions may produce unforeseen situations.

[0009] As a first non-limiting exemplary embodiment there is provided a method of controlling a screening device, the method comprises:

- registering a climate characteristic based on a sensor,
- controlling the position of the screening device based on the registered climate characteristic,

- interrupt the control of the position of the screening device in accordance with a defined temporal scheme.

5 **[0010]** The first exemplary embodiment may further comprise a method wherein control of the position are commands changing the position of the screening device e.g. operate the screening to open and/or close.

10 **[0011]** The first exemplary embodiment may further comprise a method wherein the defined temporal interruption scheme is manually defined by a user.

[0012] The first exemplary embodiment may further comprise a method comprising displaying the scheme and providing editing of the scheme.

15 **[0013]** The first exemplary embodiment may further comprise a method wherein the defined scheme is predefined.

[0014] The first exemplary embodiment may further comprise a method wherein the defined scheme is predefined to interrupt the control of the position at night.

20 **[0015]** The first exemplary embodiment may further comprise a method wherein the scheme is a time scheme defined by periods of time where the control of the position is interrupted.

25 **[0016]** The first exemplary embodiment may further comprise a method according to the previous example wherein the scheme is continuous.

[0017] The first exemplary embodiment may further comprise a method wherein the scheme is defined by a countdown time period during which the control is interrupted.

30 **[0018]** The first exemplary embodiment may further comprise a method according to previous example wherein the defined scheme is initiated manually by a user and after the countdown time the scheme returns to a continuous scheme.

35 **[0019]** The first exemplary embodiment may further comprise a method wherein defining the countdown time period is provided by a manual input gradually increasing the time period.

40 **[0020]** The first exemplary embodiment may further comprise a method wherein defining the countdown time period is provided by a manual key input gradually increasing/decreasing the time period when pressed a number of times or long pressed.

45 **[0021]** The first exemplary embodiment may further comprise a method wherein the control is resumed after the interrupt.

50 **[0022]** The first exemplary embodiment may further comprise a method wherein the interruption scheme is predefined and dependent on a criterion indicative of the type of screening device.

[0023] The first exemplary embodiment may further comprise a method wherein the interruption scheme is predefined and dependent on a criterion indicative of the room name or type in which the screening device is located.

[0024] The first exemplary embodiment may further

comprise a method wherein commands controlling the position triggered during the interruption are executed when the control is resumed e.g. when the interruption ends.

[0025] The first exemplary embodiment may further comprise a method wherein control of the position of the screening pending during the interruption is executed when the control is resumed e.g. when the interruption ends.

[0026] The first exemplary embodiment may further comprise a method wherein the controller receives the position of the screening to establish when a manual operation is performed by a user.

[0027] The first exemplary embodiment may further comprise a method wherein the controller receives the position of the screening to verify the position matches the controlled position and the controller operates the screening to the correct controlled position.

[0028] The first exemplary embodiment may further comprise a method wherein controlling the position of the screening device are operations opening or closing the screening.

[0029] The first exemplary embodiment may further comprise a method wherein the sensor is a solar sensor and/or temperature sensor.

[0030] The first exemplary embodiment may further comprise a method wherein screening devices to be interrupted may be added and/or removed from the scheme, individually and/or in groups.

[0031] The first exemplary embodiment may further comprise a method with a first interruption scheme and a second interruption scheme where the first interruption scheme is continuous and reoccurring and the second interruption scheme is single and instant.

[0032] The first exemplary embodiment may further comprise a method with a first interruption scheme and a second interruption scheme.

[0033] The first exemplary embodiment may further comprise a method according to previous example where the first interruption scheme is defined by periods of time where the control of the position is interrupted and the second interruption scheme is defined by a countdown time period during which the control is interrupted.

[0034] The first exemplary embodiment may further comprise a method wherein the position is controlled to provide energy conservation by screening sunlight and blocking sunlight appropriately based on a climate characteristic.

[0035] The first exemplary embodiment may further comprise a method wherein the position is controlled to reduce heat gain and/or heat loss.

[0036] The first exemplary embodiment may further comprise a method wherein the position is controlled to provide privacy by screening when it is dark/evening.

[0037] The first exemplary embodiment may further comprise a method wherein the position is controlled to provide comfort by shading direct sunlight or strong sunlight.

[0038] As a second non-limiting exemplary embodiment there is provided a screening device controller comprising:

means configured to register a climate characteristic by a sensor, timer means;

means configured to control the position of a screening device based on the registered climate characteristic,

wherein the screening device controller is configured to control a screening device according the method of the first exemplary embodiment.

[0039] As a third non-limiting exemplary embodiment there is provided a computer program product comprising computer program code stored on a computer-readable storage medium which, when executed in a screening controller, carries out the method according to the first exemplary embodiment.

[0040] One non-limiting advantage that is gained by the use of the exemplary embodiments is, that based on these user friendly interruption schemes the user is less likely to disable the controller and when the controller remains active energy savings may be provided.

[0041] Other features and advantages of the disclosed embodiments will appear from the following detailed disclosure, from the attached dependent claims as well as from the drawings. Generally, all terms used in the claims are to be interpreted according to their ordinary meaning in the technical field, unless explicitly defined otherwise herein. Steps do need not be performed in the disclosed sequence, unless explicitly defined. All references to "a/an/the [element, device, component, means, step, etc]" are to be interpreted openly as referring to at least one instance of the element, device, component, means, step, etc., unless explicitly stated otherwise.

Brief description of the drawings

[0042] The foregoing and other aspects of the teachings of this invention are made more evident in the following description, when read in conjunction with the attached figures, wherein:

Fig. 1 shows an example of screening devices and controllers.

Fig. 2 shows an example of a controller.

Fig. 3 shows an example of interruption scheme definition.

Fig. 4 shows another example of interruption scheme definition.

Detailed description

[0043] The disclosed embodiments will now be described more fully hereinafter with reference to the accompanying drawings, in which certain examples are shown. These disclosed examples may, however, be em-

bodied in many different forms and should not be construed as limited; rather, these examples are provided by way of example so that this disclosure will be thorough and complete, and will fully convey the scope of the disclosed embodiments to those skilled in the art. Like numbers refer to like elements throughout.

[0044] Fig. 1 illustrates a building with screening devices 1 and windows 2. Screening devices may for example be an awning 1 a, roller shutter 1 b or venetian blind 3c. Such screening devices may for example be controlled by integrated, wired or wireless controllers 3,4,5. Sensors 6 may measure the climate 7 both inside and/or outside in order to control the position of the screening devices in a logical manner. For example the climate sensors may be a temperature sensor, solar sensor, solar angle/direction sensor, wind sensor, rain sensor, light level sensor, air quality sensor etc. Based on the sensor(s) the controller may operate the screening to conserve the temperature e.g. reduce heat gain and heat loss. Hereby user comfort is increased and energy savings are provided. Based on the sensor(s) the controller may operate the screening to provide privacy by closing the screening when it is dark/evening.

[0045] Advantageously the controller is configured to provide energy savings and improve the thermal comfort. The energy savings are enhanced by a plurality of aspects, illustrated by the following examples: In one example the controller is preconfigured to interrupt the screening operation during night to provide silence and further configured to resume the screening operation the next day. Hereby the user does not experience disturbance and allows the controller operate, whereas a disturbing controller has the risk of being disabled by the user.

[0046] In one example the controller resumes normal operation either next day or after a countdown time. When the controller is manually interrupted the controller may resume normal operation, so there is no risk that the user forgets to enable the controller and waste of energy/thermal comfort. In one example the controller receives the position of the screening (for example by polling) and operates the screening if the position is not optimal. Hereby the energy savings and thermal comfort is improved, because a screening may be manually opened or closed by a user and the user may forget to return the screening to the optimal position. Likewise the screening may be manually operated during interruption and when the controller resumes the controller receives the position of the screenings to verify that the screenings are positioned correct and the controller operates the screenings if position is not correct.

[0047] The controller comprises a processor including one or more timers and possibly a calendar program. To control the position of the screening device the controller has a motor driver or communication facilities to a motor driver. Possibly the controller receives feedback of the position of the screening device(s). The controller receives climate sensor data by wire or wirelessly. Based

on the climate data the controller may control the position of the screening to provide comfort, privacy and security. The controller may be one unit but also more units, like a wireless controller 4 (remote) and integrated device controller 5. A central home automation controller may also cooperate with plural terminals or remotes.

[0048] Fig. 2 illustrates an example of a controller 10 with a display 11 and input keys 12. As mentioned a controller may be wireless like for example a screening remote control. The display 11 provides navigation and allows the user to select one or more screening devices 13. The screening devices may also be arranged in groups or rooms, like shown in fig 2. "Bedroom 1" is selected and the display shows the screening devices from "Bedroom 1". The controller provides selection of a screening device 13 and allows setting a position 14 e.g. opening or closing the screening.

[0049] The screening controller has user input means. The controller input means may for example be a remote, a keypad, dial, a graphical user interface and the input may be provided through sensors configured to detect the user's gestures etc.

[0050] Fig. 3 illustrates one example of interruption scheme definition. In one example the period 15 like weekdays or weekends 15 may be selected. Then the start time 16 of the interruption and end time 17 of the interruption is configured. Other examples are possible, like each week day (Monday to Sunday) where interruption may individually be defined. The interrupt scheme may be continuous and employ start time 16 of the interruption and end time 17 of the interruption.

[0051] The interruption scheme may be predefined based on one or more criteria. For example the criterion "room name" may be used to provide different interruption schemes, because a bedroom and a garage have different needs, so comfort is more important for bedroom while security and energy savings in garage. So the interruption schemes may be predefined based on the room name. The room type/names may for example be kitchen, bathroom, toilet, bedroom, office, hall, living room, dining room, TV room, garage etc.

[0052] The screening device name may similarly be a criterion. Screening devices generate different amount of noise. For example a roller shutter makes more noise than an awning. For example and screening device mounted outside like awning makes less noise than a screening device mounted inside like venetian blind. So the predefined interruption scheme may take into account the name/type of screening device. (The noise criterion may also be stored in a device by the manufacturer, so a more precise interruption scheme may be offered.)

[0053] Criteria like the room name criterion and/or screening device name/type criterion may be used to suggest more relevant interruption schemes to the user. Alternatively the user may manually define a noise criterion for a room, a screening device or a group of screening devices and based on the user defined noise criterion the interruption scheme may be predefined.

[0054] Fig. 4 illustrates another example of defining the interruption scheme. An input 18 (Disable) in the main screen 11d allows quick and user friendly interruption. The input 18 may be a key pressed in a sequence or long pressed to gradually increase the interrupt scheme 19 (1 hour, 2hours, 6hours, 12hours, permanent). Hereby a single soft key 18 enables the user to disable, enable and interrupt the controller for defined time in a very easy and intuitive manner.

[0055] In one embodiment the controller has at least a first scheme and a second scheme, where the first scheme is explained in connection with fig 3 and the second scheme is explained with in connection with figure 4. Hereby the controller is flexible by allowing a user to set up the first continuous scheme (for example during night) and also providing the option to activate the second instant scheme when sudden interruption is desired.

[0056] The scheme may be continuous which is understood as reoccurring every period such as every day. The period may also be day, week, month, season etc. or based on a calendar. The continuous interrupt scheme may employ start time 16 of the interruption and end time 17 of the interruption.

[0057] It will be understood that the embodiments described herein are merely exemplary and that variations and modifications of the teachings will still fall within the scope of this invention. For example more complex criteria like presence of a particular user/device etc. may also be used. Furthermore, some of the features of the examples of this invention may be used to advantage without the corresponding use of other features. As such, the foregoing description should be considered as merely illustrative of the principles, teachings, examples and embodiments of this invention, and not a limitation thereof.

Claims

1. A method of controlling a screening device **characterized in that** the method comprises:

- registering a climate characteristic based on a sensor,
- controlling the position of the screening device based on the registered climate characteristic,
- interrupt the control of the position of the screening device in accordance with a defined temporal scheme.

2. A method according to any previous claims wherein the defined temporal interruption scheme is manually defined by a user.

3. A method according to any previous claims wherein the scheme is a time scheme defined by periods of time where the control of the position is interrupted.

4. A method according to any previous claims wherein

the scheme is defined by a countdown time period during which the control is interrupted.

5. A method according to any previous claims wherein the control is resumed after the interrupt.

6. A method according to any previous claims wherein the interruption scheme is predefined and dependent on a criterion indicative of the type of screening device and/or the room type in which the screening device is located.

7. A method according to any previous claim wherein commands controlling the position triggered during the interruption are executed when the control is resumed e.g. when the interruption ends.

8. A method according to any previous claims wherein defining the countdown time period is provided by a manual input gradually increasing the time period.

9. A method according to any previous claims with a first interruption scheme and a second interruption scheme.

10. A method according to claim 9 where the first interruption scheme is continuous and reoccurring and the second interruption scheme is single and instant.

11. A method according to claim 9 or 10 wherein the first interruption scheme is defined by periods of time where the control of the position is interrupted and the second interruption scheme is defined by a countdown time period during which the control is interrupted.

12. A method according to any previous claims wherein the defined scheme is initiated manually by a user and after a countdown time the scheme returns to a continuous scheme.

13. A method according to any previous claims wherein the controller receives the position of the screening to verify the position matches the controlled position and the controller operates the screening to the correct controlled position.

14. A screening device controller comprising:

means configured to register a climate characteristic by a sensor,
timer means;
means configured to control the position of a screening device based on the registered climate characteristic,
wherein the screening device controller is configured to control a screening device according to the method of claim 1-13.

15. A computer program product comprising computer program code stored on a computer-readable storage medium which, when executed in a screening controller, carries out the method according to any one of claims 1-13.

5

10

15

20

25

30

35

40

45

50

55

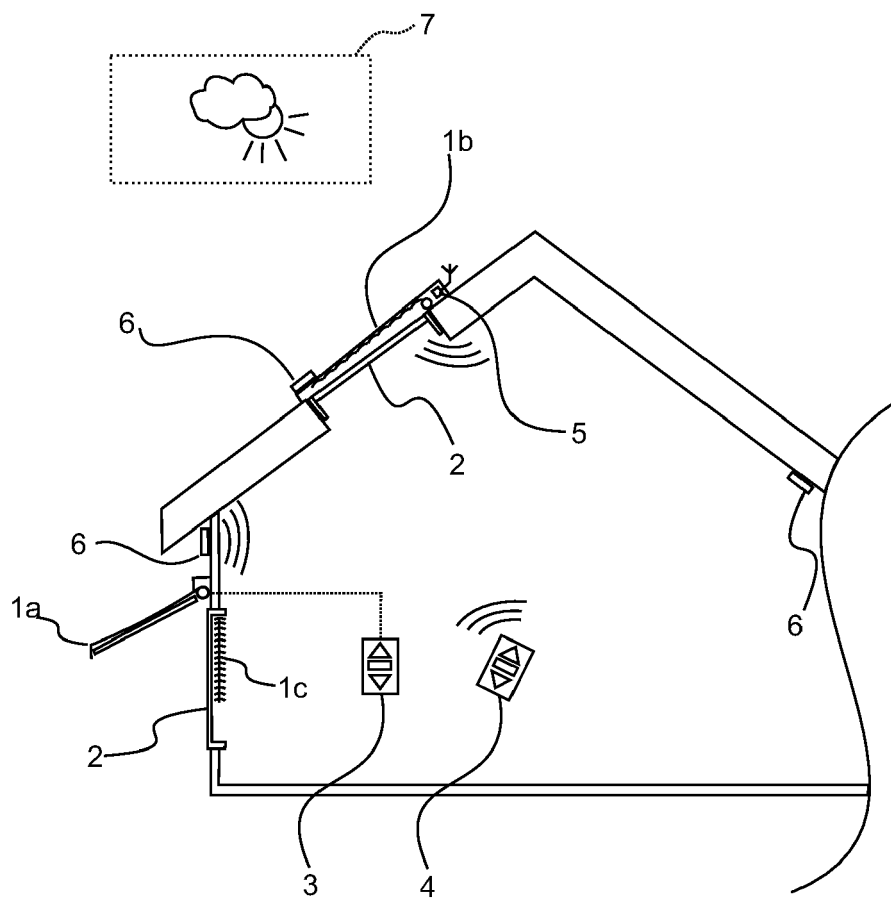


Fig. 1

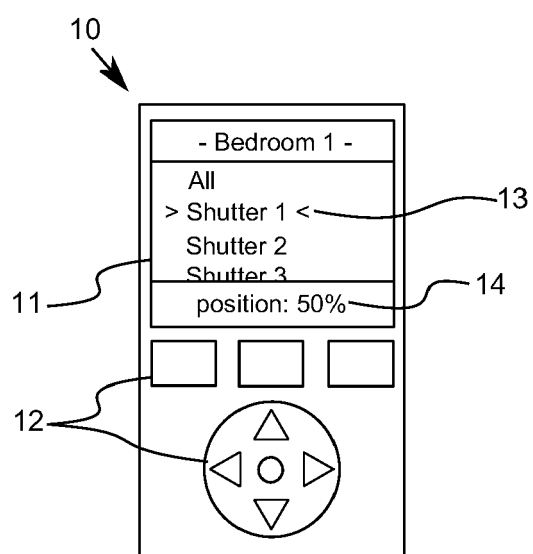


Fig. 2

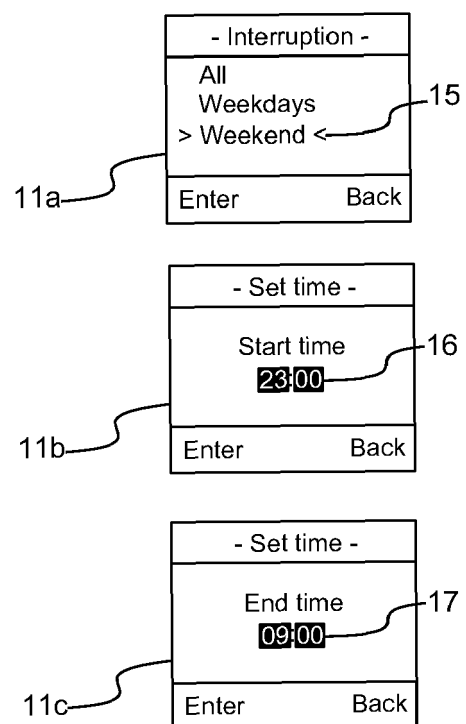


Fig. 3

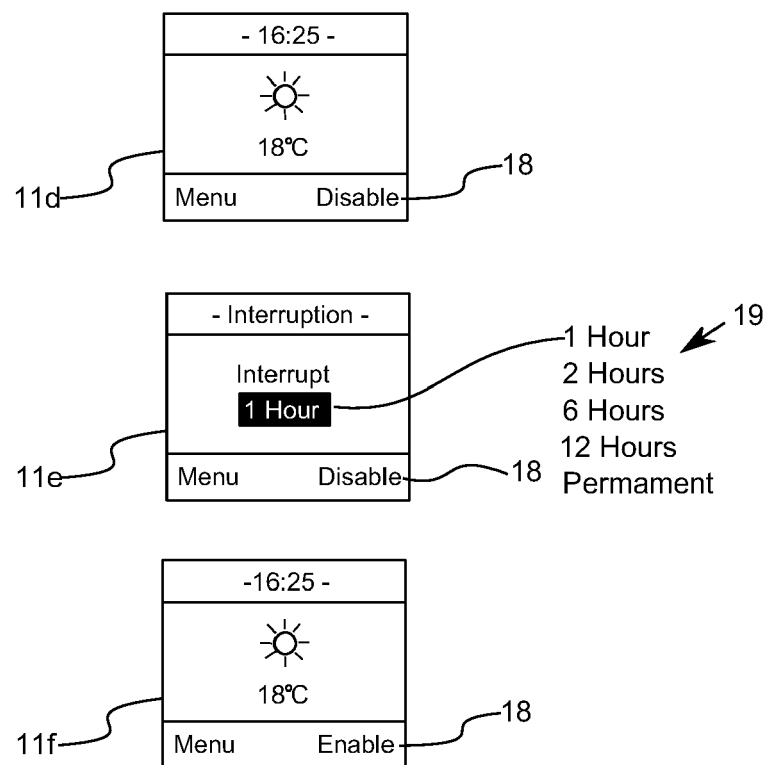


Fig. 4

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- DE 202006009694 [0003]