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(54) **METHOD AND APPARATUS FOR DEFINING ILLUMINATION PARAMETERS**

(57) Method (100, 100') for defining illumination parameters (1c, 2c, 2c2, 3c), comprising the steps; providing (110) an illumination space (14); defining a first point (14a) of the illumination space (14), the first point (14a) assigned to a first illumination parameter (1c); defining a second point (14b) of the illumination space (14), the second point (14b) assigned to a second illumination parameter; storing (130) the first and second illumination parameter; and outputting (140a, 140b) control commands to an illumination device so as to induce the illumination device to reproduce a first light effect according to the first illumination parameter (1c) and a second light effect according to the second illumination parameter.

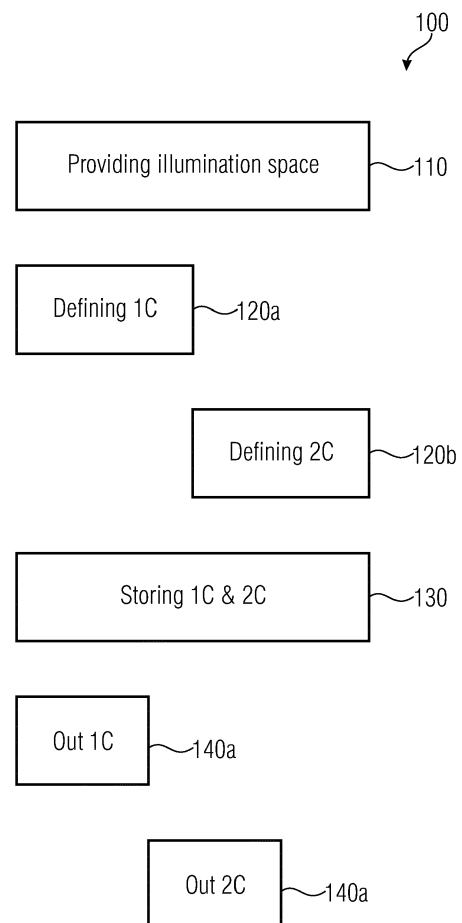


Fig. 1a

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Description

[0001] Embodiments of the present invention refer to a method and a corresponding apparatus for defining illumination parameters, like a color or an illumination angle. Preferred embodiments refer to a computer program, like an APP which can be carried out by use of a computer, like a smart device (smart phone or tablet PC), for controlling one or more illumination devices via illumination parameter.

[0002] Conventional illumination control is performed by use of light mixing desks, which often make use of the DMX standard. Additionally, there are computer implemented variants, like the software DMX control. Both form an effect generator for controlling lighting fixture effects to be reproduced by use of one or more illumination devices. These generators are handled by selecting a preprogrammed effect engine where it is possible to treat different parameters and in this way makes it possible to change the effect generator behavior. Conventional effect generators have the drawback that they are quite complex so that the operator convenience is limited. Therefore, there is a need for an improved approach.

[0003] An objective of the present invention is to provide a control approach for the illumination device having an improved tradeoff of flexibility and operator convenience.

[0004] The objective is solved by the subject matter of the independent claims.

[0005] Embodiments of the present invention provide a method for defining illumination parameters. According to embodiments, the illumination parameters can be defined to certain colors and/or to room directions/illumination angles and/or to other parameters defining illumination effects. The method comprises the steps:

- providing an illumination space;
- defining a first point of the illumination space, the first point assigned to a first illumination parameter and defining a second point of the illumination space, the second point assigned to a second illumination parameter;
- storing the first and second illumination parameter; and
- outputting control commands to an illumination device so as to induce the illumination device to reproduce a first light effect according to the first illumination parameter and a second light effect according to the second illumination parameter.

[0006] Embodiments of the present invention are based on the principle that by use of a graphically illustrated illumination space, like a color space or a position space, a user can easily define two or more points within the illumination space which are assigned to illumination parameters, such that the parameters can be stored. For example, the user defines two points assigned to two different colors, so that when outputting the stored illu-

mination parameters the illumination device can reproduce the two colors subsequent to each other. Consequently, embodiments of the present invention let users have a more intuitive way to handle lighting effects by drawing and/or taping a lighting effect.

[0007] According to embodiments, the two or more points assigned to the respective illumination parameter are also assigned to points of time or relative points of time. Therefore, the method comprises a step of defining a first and a second point of time for the first and the second light effects or wherein the method comprises the step of defining relative points of time for the first and the second light effects. Alternatively, the method may comprise the step of defining a transition duration which is variable or predetermined, wherein the transition duration defines relative first and second points of time for the first and the second light effects. Here a speed controller may be used for defining the transition duration. The speed controller determines a duration, e.g., five seconds, thirty seconds or one minute during which the first effect is replaced by the second effect. Starting from the defined transition duration or the defined points of time the method may comprise the step of outputting control commands is performed, such that the first illumination effect according to the first illumination parameter is performed at a first point of time and the second illumination effect according the second illumination parameter is performed at a second point of time.

[0008] Above embodiments have been described in the context of an illumination scene comprising two illumination effects, namely the first and the second illumination effect. According to further embodiments, another illumination effect, namely a third illumination effect subsequent to the second illumination effect may be defined. Here, the method comprises the step of defining a third point of the illumination space, wherein the third point is assigned to a third illumination parameter. This third point may lie on a line, straight line or bent line, together with the first and the second point within the illumination space or may be somewhere else in the illumination space, so that a zigzag line is generated. According to further embodiments, further points between the first and the second point may be defined, e.g. to generate a straight, curved or zigzag line. All points on the line can be assigned to further illumination parameters, so when controlling an illumination device according to the further illumination parameters a transition between the first and second effect (according to the first and second illumination parameter) is defined. In both embodiments, the step of outputting the control commands may be performed, such that the illumination device reproduces the third illumination effect according to the third illumination parameter or the further illumination effect(s) according to the further illumination parameters.

[0009] A preferred embodiment starts from the assumption that the illumination space is (graphically) provided on the display, e.g., a display of a smart phone or tablet PC. The first and second illumination points (or

according to enhanced embodiments the first, further, second, and/or third illumination points) are defined by tipping on the touch screen, i.e. manually / as response on a user input. For example, just the certain points within the illumination space may be selected or the user can define the points by drawing a respective line within the illumination space so that a plurality of points (subsequent to each other) are defined. When starting from the assumption that just some points are selected point wise, the method may further comprise the step of defining a transition between the defined points, e.g., the first and the second point of the illumination space by connecting the points, wherein the connection comprises a plurality of further points. Preferably, this definition of the further points may be performed automatically. The connection may be a straight connection or a bent connection. The definition of a transition has the benefit in that an illumination scene having a plurality of clearly defined transition points are available. This enables for the subsequent step of outputting control commands that illumination effects, according to the parameters belonging to the plurality of connection points, can be output so that a smooth transition between the first and the second or the first, the second and the third illumination effect is enabled. Here, the illumination effects are generated in the order as given by the (input) order of the points / parameters

[0010] According to embodiments, the illumination space comprises a color space, wherein the first illumination parameter is assigned to a first color and the second illumination parameter is assigned to a second color. When coming back to the embodiment defining the transition, it is clear that within the color space a plurality of other colors lie on the connection, wherein these further points are then so defined that during the illumination scheme all colors are reproduced by the illumination device.

[0011] According to a further embodiment, the illumination space may be a position space. The first illumination parameter defines a first illumination direction or first illumination angle, like plus 45 degree of the tilt and wherein the second illumination parameter defines a second illumination direction or a second illumination angle, e.g., minus 45 degree.

[0012] In general, the illumination space may comprise one dimension, e.g., the tilt angle, or more than one direction, e.g., two directions, for example the tilt angle and a deviation angle (left right). Controlling by use of one dimension is typically used for illumination devices having just one movable axis, like in illumination bar, wherein the two-dimensional control approach may be used for illumination devices which can be directed within the room to at least two directions. Alternatively, parameters belonging to one dimension may be used for controlling a zoom. According to further embodiments, the color space and the position space may be combined, so that one dimension refers to an angle, while the other direction refers to an illumination color or a brightness.

[0013] To sum up, the above discussed approach for

controlling is flexible for defining a plurality of illumination parameters belonging to different properties of an illumination scene.

[0014] As discussed above, the transition duration may be defined together with the points. Since all illumination points or the assigned parameters are stored, the effect may be repeated for another or a plurality of another circuit. In other words, this means that the first and second points of the illumination space are defined based on a user command.

[0015] Another embodiment refers to a software for performing the method since a plurality of steps are computer implemented. Another embodiment provides an apparatus or mobile device, like a smart phone or table PC, which comprises a user interface, a memory and a control interface. The user interface is configured to provide an illumination space, wherein the user interface is configured to receive a user command defining a first point of the illumination space and a second point of the illumination space. According to embodiments, the user interface may be a touch screen. The memory stores the first and second illumination parameter belonging to the first and second points of the illumination space. The control interface is configured to output control commands to an illumination device so as to induce the illumination device to reproduce the first light effect according to the first illumination parameter and a second light effect according to the second illumination parameter.

[0016] According to embodiment, this apparatus/mobile device may be enhanced by features which have been discussed above.

[0017] Optional features are defined by the dependent claims. Embodiments of the present invention will subsequently be discussed referring to the enclosed figures.

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|----|---------------|--|
| 35 | Fig. 1a | shows a schematic flow chart illustrating a basic embodiment of the method for defining illumination parameters; |
| 40 | Fig. 1b | shows a schematic flow chart of enhanced embodiments for defining illumination parameters; |
| 45 | Fig. 2 | shows a mobile device for defining illumination parameters according to other embodiments; |
| 50 | Fig. 3a to 3e | show a schematic illustration of a machine user interface for defining the illumination points of the illumination space (here color space) according to an embodiment; and |
| 55 | Fig. 4a to 4e | show a schematic representation of a machine user interface for defining illumination points of an illumination space (here position space) according to a further embodiment. |

[0018] Below, embodiments of the present invention will subsequently be discussed referring to the enclosed figures, wherein identical reference numbers are provided to elements having identical or similar functions, so the description thereof is mutually applicable and interchangeable.

[0019] Fig. 1a shows a schematic block diagram of a method 100 for defining illumination parameters 1c, 2c, etc. The method comprises the following basic steps 110, 120a, 120b, 130, 140a, 140b.

[0020] Within the first step 110 an illumination space, e.g., a color space, like a two-dimensional or one-dimensional color space is provided to the user. For example, the color space may be displayed via a touch screen 12 of a smart device 10 (cf. Fig. 2). Here, the color space/illumination space 14 has two dimensions, namely X and Y, wherein this is just exemplary so that the illumination space may also have just one dimension or more.

[0021] Within the next two steps 120a and 120b, at least two points within the illumination space 14, here the points 14a (cf. step 120a) and 14b (cf. step 120b), are defined. The definition may be based on a user command, e.g., when the user marks a point within the illumination space 14, e.g., by tipping into the provided illumination space 14. Illumination parameters, like different colors 1c and 2c, are assigned to points of the illumination space.

[0022] Within the step 130, these illumination parameters 1c and 2c are stored in the memory. This memory is exemplarily illustrated by the reference numeral 16 of the device 10 (cf. Fig. 2).

[0023] Within a subsequent step 140a/140b, which, according to embodiments, may be initiated by another command, like a user input "play", the stored illumination parameter 1c and 2c are output (cf. the steps 140a and 140b). The outputting may be performed by an interface 18, e.g., a wireless interface, like wireless DMX or a wired interface DMX or another standardized interface. The outputting 140a and 140b is performed for an illumination device (not shown). The illumination device is configured to reproduce illumination effects according to the illumination parameter 1c and 2c (i.e. reproducing illumination effect 1c before reproducing illumination effect 2c).

[0024] For example, the illumination device may be an illumination device comprising RDB LEDs so different colors can be reproduced. The illumination parameters 1c and 2c are standardized so that the illumination device can directly reproduce the respective color. Of course, other illumination devices, like turnable spots or pivotable lighting bars may be used which are configured to be controlled by illumination parameters (cf. 1c and 2c), e.g., defining a pivoting angle or an illumination direction.

[0025] Fig. 1b shows a further embodiment, namely an enhanced method 100'. The method comprises the steps 110, 120a, 120b, 120c, 130, the optional step 133, the optional step 136, the optional start point 139 and the steps 140a, 140b, 140b2, 140c.

[0026] The steps 110, 120a, 120b, 130, 140a and 140b

are performed analogously to the steps as discussed in the context of Fig. 1a.

[0027] The newly added step 120c enables to define a third point (for example subsequent to the second point) within the illumination space 14, e.g., the point 14c. As illustrated by Fig. 2, the point 14c is not necessarily arranged on the connection line of the points 14a and 14b. Alternatively, a step 120c, which is illustrated subsequent to the step 120b, may also be performed between the step 120a and 120b so that a position between 14a and 14b should be defined. Here, the position between means that a respective order should be determined by the order of the steps 120a to 120c. All steps 120a to 120c may be performed based on an user input.

[0028] All the points and the assigned illumination parameters 1c to 3c are stored within the memory by use of the step 130.

[0029] Subsequent to the step 130 an optional step of 133 may follow. Within this step interim points, e.g., an interim point 14b2 between the points 14b and 14c may be defined. This step may preferably be performed automatically, wherein the interim point 14b2 is based on the points 14b and 14c. For this step, an interpolation approach may be used.

[0030] The next step 136 is also optional and enables to define a transition duration, i.e., the time period for reproducing the illumination effects according to the first and the last illumination parameter, here the illumination parameter 1c and 3c. This step is based on a user command, wherein the user, for example, defines the duration by a virtual revelator. This duration may be stored within the memory together with the illumination parameters 1c to 3c.

[0031] Within the last steps 140a, 140b, 140b2 and 140c the previously defined illumination parameter 1c, 2c, 2c2 and 3c are output to the illumination device. Note that the illumination parameter 2c2 belongs to the further point 14b2 of the illumination space.

[0032] According to a further embodiment, the outputting steps 140a to 140d are performed in response to the start signal (cf. start point 139).

[0033] Fig. 2b shows an apparatus 10 comprising the basic entities machine interface 12, here touch screen, memory 16 and interface 18 for outputting the control signals. This apparatus 10 is shown by Fig. 2 and may be preferably implemented as user equipment, like a smart phone or tablet PC.

[0034] With respect to Figs. 3 and 4, detailed embodiments for defining illumination points of a color space and a position space will be discussed.

[0035] Figs. 3a to 3e show a graphical machine user interface 12' for five subsequent steps.

[0036] The user starts a software application with an image of a color background which forms the color space/illumination space 14 (cf. Fig. 3a). Here, the user defines a first point by tapping on the top of the color background and/or drawing as illustrated by the figure at position 14a. After that, another point 14b is marked (cf. Fig. 3b) before

marking a third point 14c (cf. Fig. 3c).

[0037] All these points or the connection lines between the points 14a, 14b and 14c are stored, so that same can be reproduced as illustrated by Fig. 3d. Fig. 3d shows a play button which enables that the stored points/stored illumination parameters belong to the points 14a to 14c are output to be reproduced. The play button is marked by the reference numeral 15 enabling to start the effect after defining the points 14a to 14c. The reproduction of the four points is illustrated by Fig. 3e.

[0038] As can be seen, according to embodiments, not only the illumination parameter belonging to the four points 14a to 14c are reproduced but also the interim points between the points 14a, 14b and 14c as illustrated by the arrows. Due to the interim points, a transition from green (cf. point 14a) to red (cf. point 14b), e.g., via yellow is reproduced. Analogously, a transition from red (cf. 14b) to blue (cf. 14c) via purple is reproduced and a transition from blue (14c) to green (14a). Over a period of time the drawn/taped position will be reached and the effect engine will generate a matching color out from the position and the lighting fixture will light up in the generated color.

[0039] Regarding Figs. 3b and 3c, it should be noted that the user can also input the interim points, e.g., by sliding the finger along the error points between 14a and 14b or 14b and 14c.

[0040] Figs. 4a to 4c show another implementation of the machine user interface. Here, the illumination space 14' defines position parameters, e.g., in an X and a Y dimension. The dimensions may, for example, be a position in the space to which a lighting device should focus on its spot. When starting from the assumption that the lighting device has a tilt angle and a deviation angle, the Y axis refers to the deviation angle, while the X axis refers to the X angle.

[0041] It should be noted that these implementations are just exemplary so that other assignments, e.g., the assignment to zoom factor, may according to further embodiments also be used.

[0042] Within the first three steps which are illustrated by Figs. 4a, 4b and 4c, the three points 14a' 14b' and 14c' are defined. The positions lie somewhere within the two dimensional illumination space / position space. From another point of view, this means that the user starts a software application with an image of a coordinate system 14' and defines the points 14a' to 14c' by tapping and/or drawing on the top of the coordinates system 14'. The points or the respective illumination parameter belonging to the points 14a' to 14c' are stored.

[0043] This enables that the user can start the effect, e.g., the pivoting of the illumination unit afterwards. The start may be initiated by pressing the play button 15 (cf. 4d). Over a period of time, the drawn/taped positions 14a' to 14c' will be reached and the lighting fixture will move to the generated X, Y positions as illustrated by Fig. 4e. Here, again errors between the points 14a' and 14b', 14b and 14c' and 14c and 14a' are shown illustrating the interim positions.

[0044] Although some aspects have been described in the context of an apparatus, it is clear that these aspects also represent a description of the corresponding method, where a block or device corresponds to a method step or a feature of a method step. Analogously, aspects described in the context of a method step also represent a description of a corresponding block or item or feature of a corresponding apparatus. Some or all of the method steps may be executed by (or using) a hardware apparatus, like for example, a microprocessor, a programmable computer or an electronic circuit. In some embodiments, some one or more of the most important method steps may be executed by such an apparatus.

[0045] Depending on certain implementation requirements, embodiments of the invention can be implemented in hardware or in software. The implementation can be performed using a digital storage medium, for example a floppy disk, a DVD, a Blu-Ray, a CD, a ROM, a PROM, an EPROM, an EEPROM or a FLASH memory, having electronically readable control signals stored thereon, which cooperate (or are capable of cooperating) with a programmable computer system such that the respective method is performed. Therefore, the digital storage medium may be computer readable.

[0046] Some embodiments according to the invention comprise a data carrier having electronically readable control signals, which are capable of cooperating with a programmable computer system, such that one of the methods described herein is performed.

[0047] Generally, embodiments of the present invention can be implemented as a computer program product with a program code, the program code being operative for performing one of the methods when the computer program product runs on a computer. The program code may for example be stored on a machine readable carrier.

[0048] Other embodiments comprise the computer program for performing one of the methods described herein, stored on a machine readable carrier.

[0049] In other words, an embodiment of the inventive method is, therefore, a computer program having a program code for performing one of the methods described herein, when the computer program runs on a computer.

[0050] A further embodiment of the inventive methods is, therefore, a data carrier (or a digital storage medium, or a computer-readable medium) comprising, recorded thereon, the computer program for performing one of the methods described herein. The data carrier, the digital storage medium or the recorded medium are typically tangible and/or non-transitional.

[0051] A further embodiment of the inventive method is, therefore, a data stream or a sequence of signals representing the computer program for performing one of the methods described herein. The data stream or the sequence of signals may for example be configured to be transferred via a data communication connection, for example via the Internet.

[0052] A further embodiment comprises a processing means, for example a computer, or a programmable logic

device, configured to or adapted to perform one of the methods described herein.

[0053] A further embodiment comprises a computer having installed thereon the computer program for performing one of the methods described herein.

[0054] A further embodiment according to the invention comprises an apparatus or a system configured to transfer (for example, electronically or optically) a computer program for performing one of the methods described herein to a receiver. The receiver may, for example, be a computer, a mobile device, a memory device or the like. The apparatus or system may, for example, comprise a file server for transferring the computer program to the receiver.

[0055] In some embodiments, a programmable logic device (for example a field programmable gate array) may be used to perform some or all of the functionalities of the methods described herein. In some embodiments, a field programmable gate array may cooperate with a microprocessor in order to perform one of the methods described herein. Generally, the methods are preferably performed by any hardware apparatus.

[0056] The above described embodiments are merely illustrative for the principles of the present invention. It is understood that modifications and variations of the arrangements and the details described herein will be apparent to others skilled in the art. It is the intent, therefore, to be limited only by the scope of the impending patent claims and not by the specific details presented by way of description and explanation of the embodiments herein.

Claims

1. Method (100, 100') for defining illumination parameters (1c, 2c, 2c2, 3c), comprising the steps; providing (110) an illumination space (14); defining a first point (14a) of the illumination space (14), the first point (14a) assigned to a first illumination parameter (1c); defining a second point (14b) of the illumination space (14), the second point (14b) assigned to a second illumination parameter; storing (130) the first and second illumination parameter; and outputting (140a, 140b) control commands to an illumination device so as to induce the illumination device to reproduce a first light effect according to the first illumination parameter (1c) and a second light effect according to the second illumination parameter.
2. Method (100, 100') according to claim 1, wherein the illumination space (14) comprises a color space, wherein the first illumination parameter (1c) is assigned to a first color and wherein the second illumination parameter (2c) is assigned to a second color.

3. Method (100, 100') according to claim 1, wherein the illumination space (14) comprises a position space, wherein the first illumination parameter (1c) defines a first illumination position and wherein the second illumination parameter (2c) defines a second illumination position; or wherein the illumination space (14) comprises a position space, wherein the first illumination parameter (1c) defines a first illumination direction and wherein the second illumination parameter (2c) defines a second illumination direction.
4. Method (100, 100') according to one of the previous claims, wherein the method (100, 100') comprises a step of defining a first and a second point (14b) of time for the first and the second light effects or wherein the method (100, 100') comprises the step of defining relative points of time for the first and the second light effects.
5. Method (100, 100') according to one of the previous claims, wherein the method (100, 100') comprises the step of defining a transition duration which is variable or predetermined, wherein the transition duration defines relative first and second points (14b) of time for the first and the second light effects.
6. The method (100, 100') according to claim 4 or 5, wherein the step of outputting (140a, 140b) control commands is performed, such that the first illumination effect according to the first illumination parameter (1c) is performed at a first point (14a) of time and the second illumination effect according to the second illumination parameter (2c) is performed at a second point (14b) of time.
7. The method (100, 100') according to one of the previous claims, wherein the method (100, 100') comprises the step of defining a third point (14c) of the illumination space, the third point (14c) is assigned to a third illumination parameter.
8. Method (100, 100') according to claim 7, wherein the step of outputting (140a, 140b) the control commands is performed, such that the illumination device reproduces a third illumination effect according to the third illumination parameter.
9. The method (100, 100') according to one of the previous claims, wherein the method (100, 100') comprises the step of defining a transition between the first and the second point (14b) of the illumination space (14) by use of a connection of the first and second illumination point within the illumination space, the connection comprises a plurality of points of the illumination space; or wherein the method (100, 100') comprises the step of defining a transition between the first and the second

ond point (14b) of the illumination space (14) by use of a connection of the first and second illumination point within the illumination space, the connection comprises a plurality of connection points of the illumination space, wherein the step of defining the transition is performed automatically. 5

10. The method (100, 100') according to claim 9, wherein method (100, 100') comprises the step of defining parameters belonging to the plurality of connection points lying on the connection between the first and the second illumination point and wherein the step of outputting (140a, 140b) control commands is performed, so as to reproduce illumination effects according the parameters belonging to the plurality of connection points. 10 15
11. The method (100, 100') according to claim 10, wherein the step of outputting (140a, 140b) the control commands is performed, such that colors assigned to the connection points are reproduced or such that positions assigned to the connection points are reproduced. 20
12. The method (100, 100') according to one of the previous claims, wherein the step of outputting (140a, 140b) the control commands is repeated for a second illumination cycle. 25
13. The method (100, 100') according to one of the previous claims, wherein the step of defining the first and the second point (14b) of the illumination space (14) is performed based on a user command. 30
14. The method (100, 100') according to one of the previous claims, wherein the illumination space (14) comprises two dimensions; and/or wherein the illumination space (14) is a two-dimensional color space or wherein the illumination space (14) is a two-dimensional position space having an x and a y dimension. 35 40
15. Computer program comprising a program code for performing, when running on a computer the method (100, 100') according to one of the claims 1 to 14. 45
16. Apparatus (10) or mobile device, comprising:

a user interface (12) configured to provide an illumination space, wherein the user interface 50 (12) is configured to receive a user command defining a first point (14a) of the illumination space, the first point (14a) assigned to a first illumination parameter, and a user command defining a second point (14b) of the illumination space, the second point (14b) assigned to a second illumination parameter; 55
a memory (16) for storing (130) the first and the

second illumination parameters (1c, 2c, 2c2, 3c); and
a control interface (18) configured to output control commands to an illumination device so as to induce the illumination device to reproduce a first light effect according to the first illumination parameter (1c) and the second light effect according to the second illumination parameter.

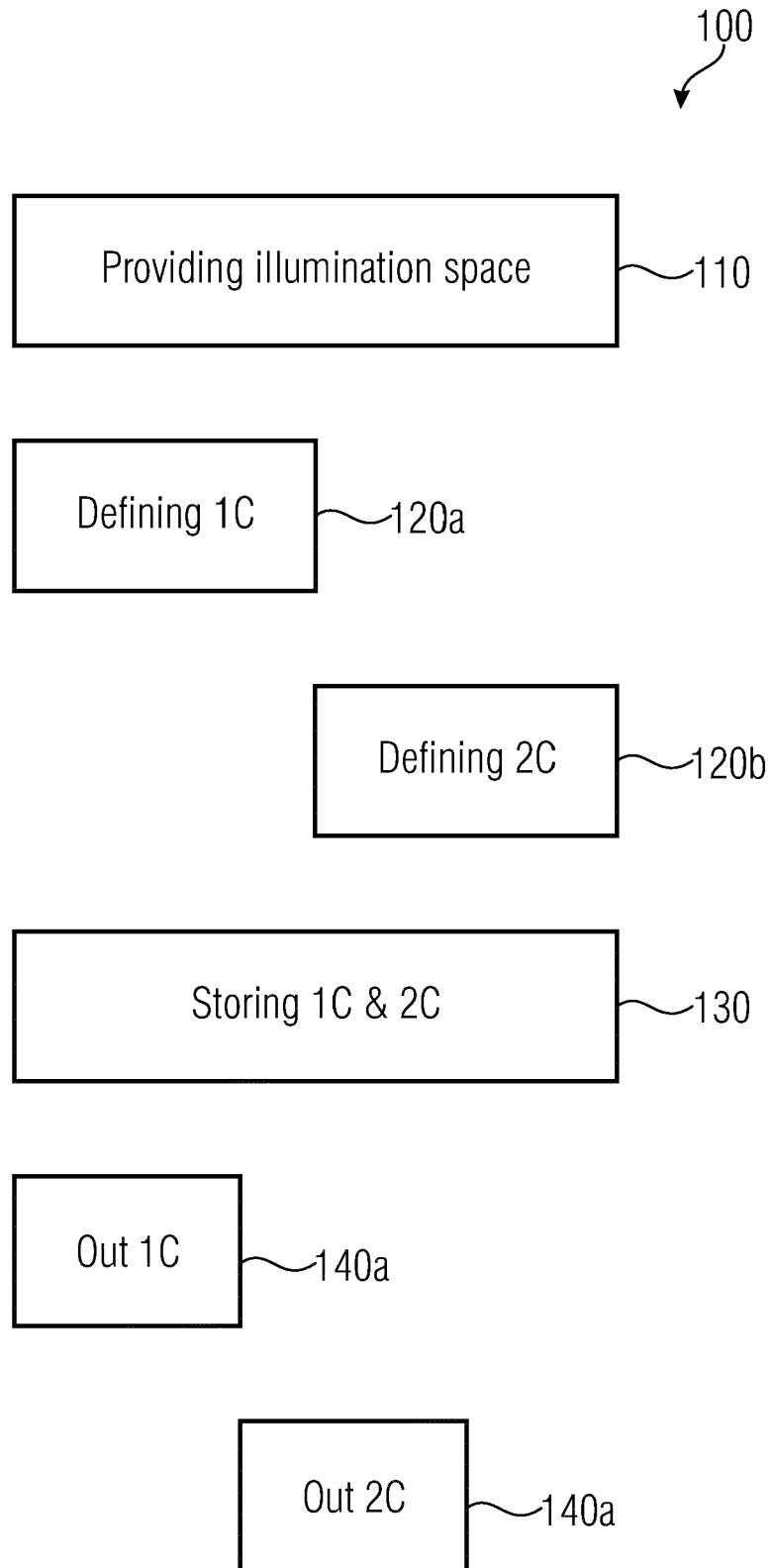


Fig. 1a

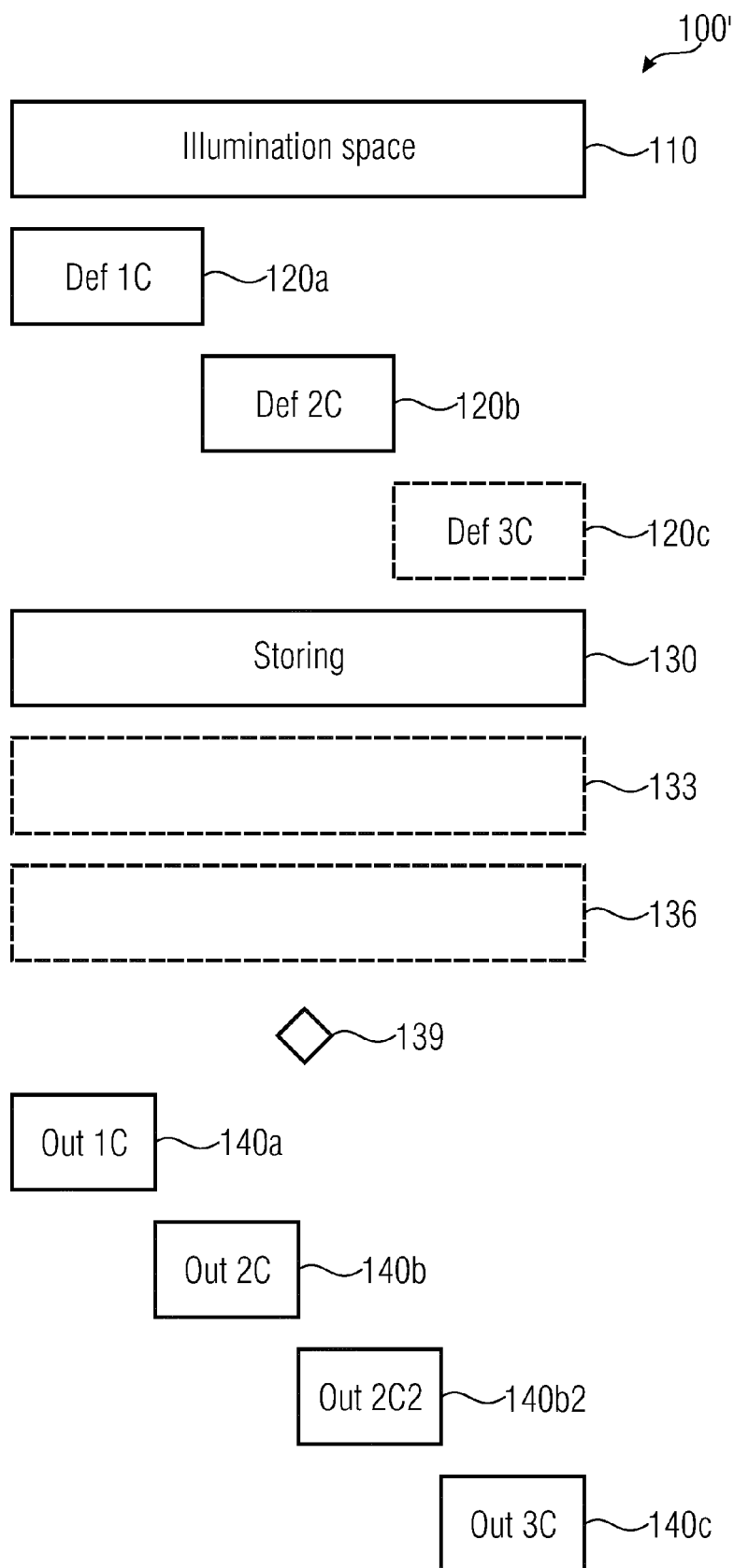


Fig. 1b

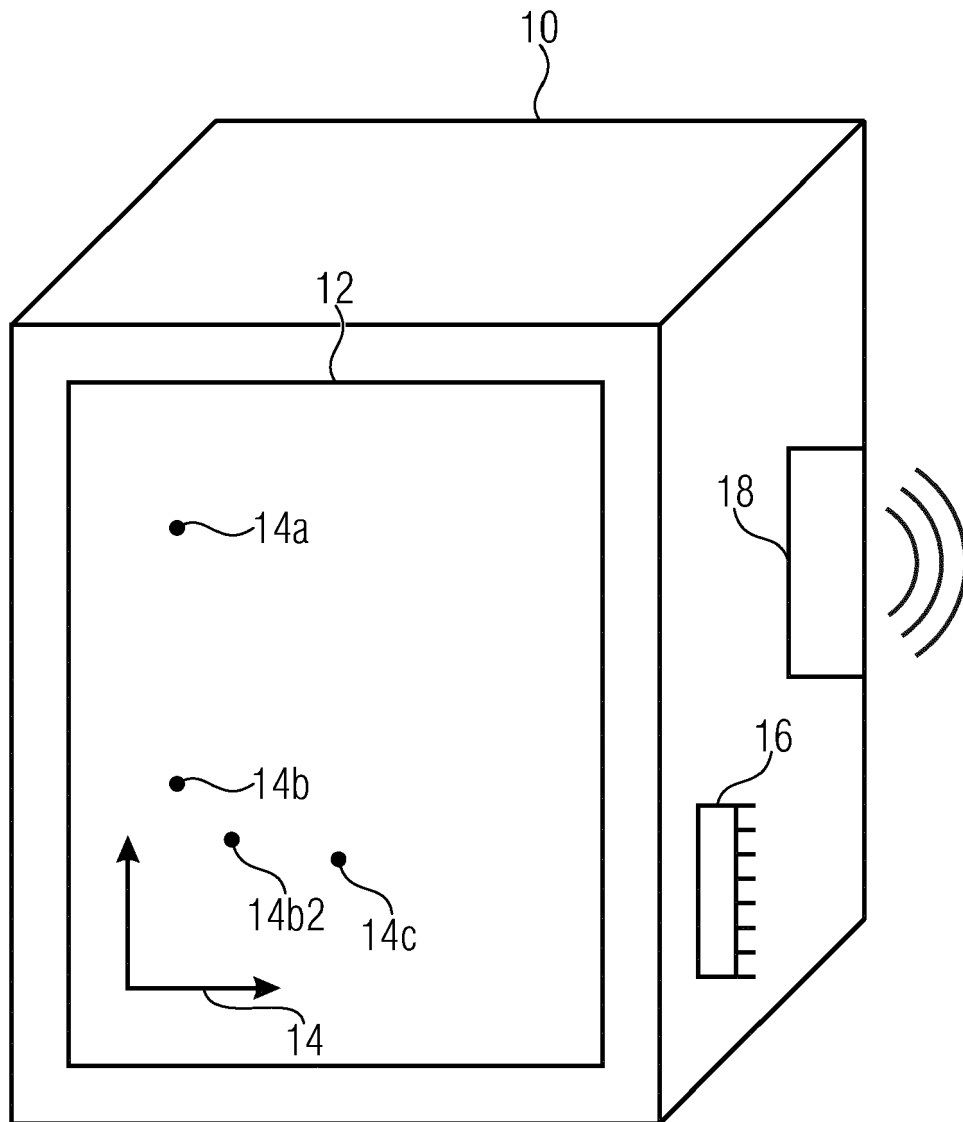


Fig. 2

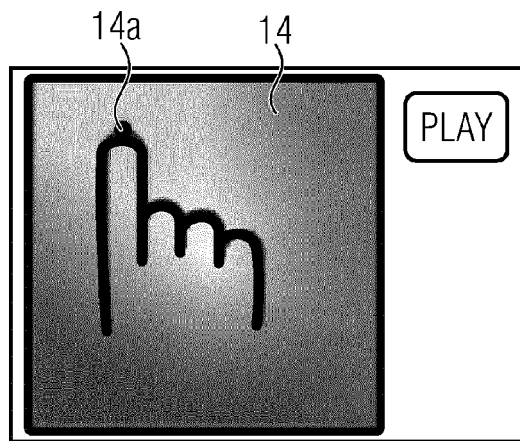


Fig. 3a

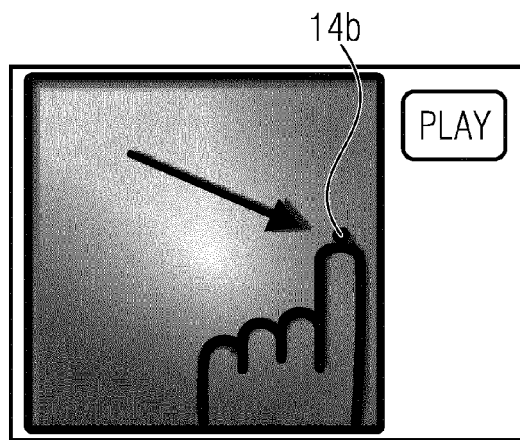


Fig. 3b

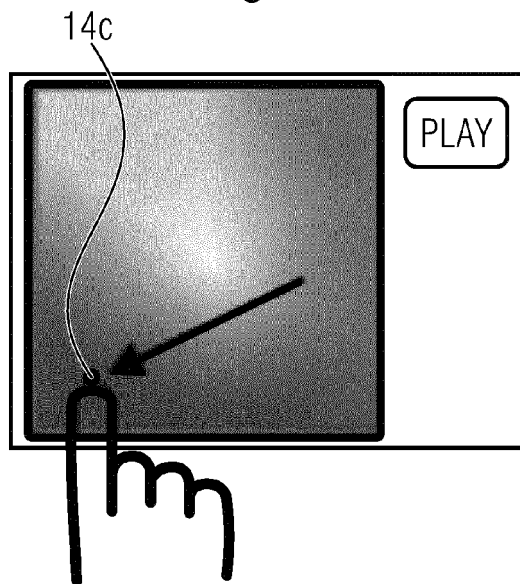


Fig. 3c

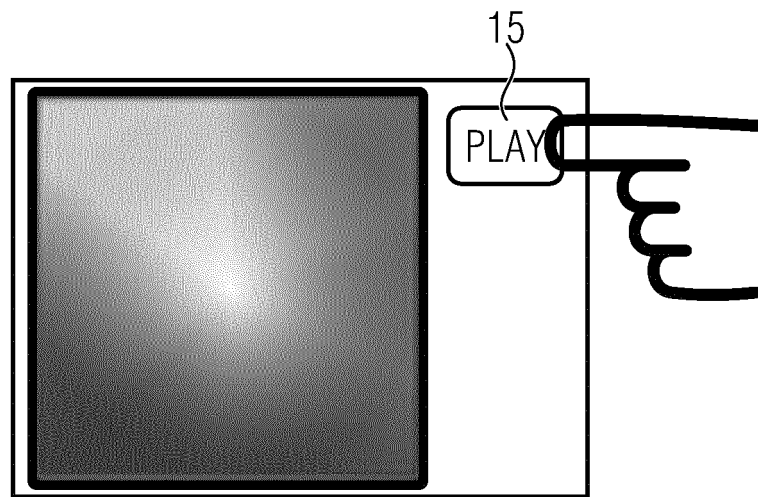


Fig. 3d

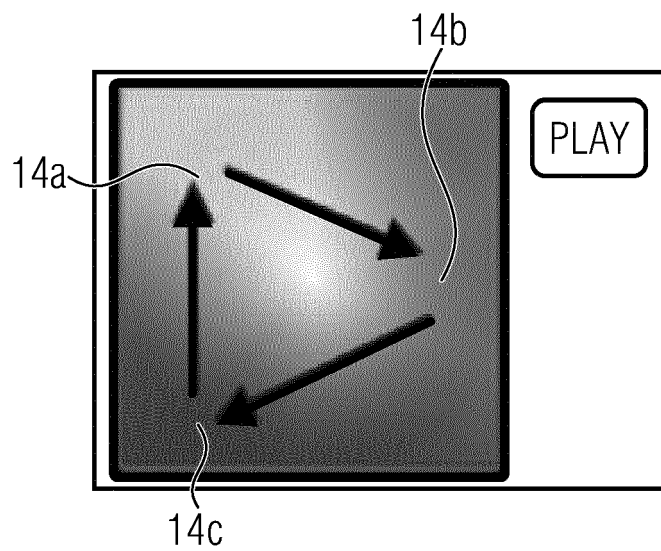


Fig. 3e

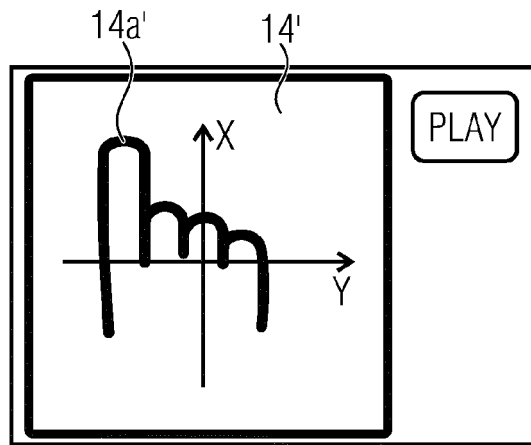


Fig. 4a

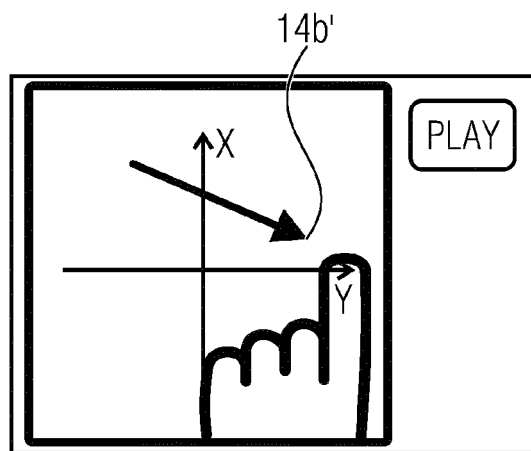


Fig. 4b

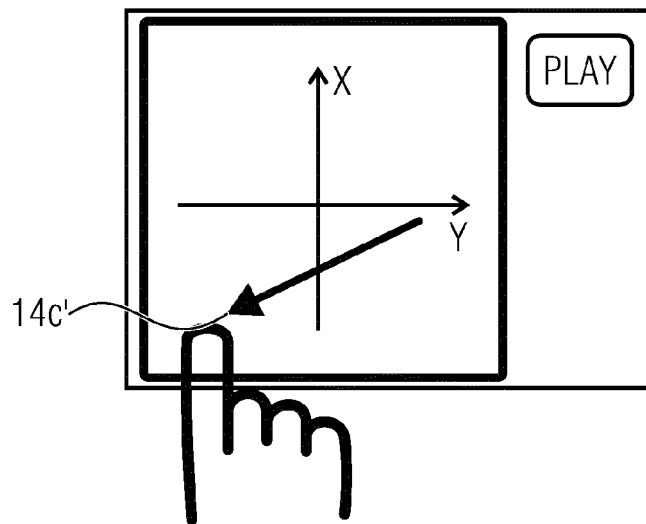


Fig. 4c

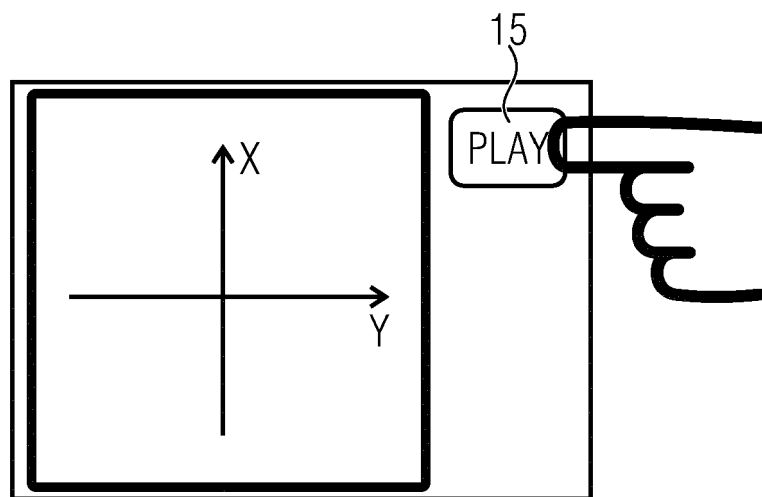


Fig. 4d

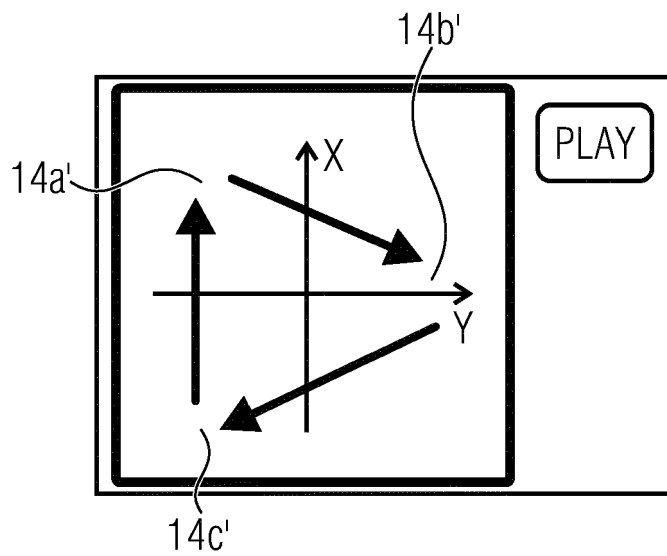


Fig. 4e



EUROPEAN SEARCH REPORT

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Place of search Munich		Date of completion of the search 6 April 2020	Examiner Plamann, Tobias
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing claims for which payment was due.

☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due and for those claims for which claims fees have been paid, namely claim(s):

☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

☒ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.

☐ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.

☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:

☐ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:

☐ The present supplementary European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims (Rule 164 (1) EPC).



LACK OF UNITY OF INVENTION
SHEET B

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The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. claims: 1, 2, 16(completely); 4-15(partially)

Method for establishing a transition from a first light effect to a second light effect to be reproduced by an illumination device according to a first and second illumination parameter, wherein the illumination parameters correspond to different colours; and a corresponding apparatus.

2. claims: 3(completely); 4-15(partially)

Method for establishing a transition from a first light effect to a second light effect to be reproduced by an illumination device according to a first and second illumination parameter, wherein the illumination parameters correspond to different illumination positions or directions; and a corresponding apparatus.

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

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5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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