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(54) GARMENT CARE DEVICE WITH LIGHT INDICATORS

KLEIDUNGSPFLEGEVORRICHTUNG MIT LICHTINDIKATOREN

DISPOSITIF DE SOINS DE VÊTEMENTS AYANT DES INDICATEURS LUMINEUX

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Description

wherein the control unit is adapted to:

FIELD OF THE INVENTION

[0001] The invention relates to the field of garment care. 5

BACKGROUND OF THE INVENTION

[0002] Garment care devices with movement sensors are already known. However, those known devices do not provide any feedback to user on the movement information. This situation has negative consequences when the user would like to proactively modify the movement of the device in order to optimize the ironing settings, so that improved ironing results can be achieved. 10 15

[0003] Document US 2004/133295 discloses a controller for a fabric grooming device to provide optimal user convenience, wherein the controller has at least an interface. 20

[0004] Document US 2013/125427 discloses an iron comprising: a water reservoir; a heatable soleplate; at least one water outlet opening; a water atomization and distribution unit; a sensor; and a control unit.

[0005] Document US 2010/242314 discloses a steam iron including a sensor for detecting and measuring movement of the steam iron. 25

[0006] Document US 2006/081588 discloses an interface for an iron with a graphic display indicating the current temperature selection, user controls for adjusting the current temperature selection, and a ready indicator. 30

[0007] Document WO 82/03520 discloses an appliance including an audible alarm and visual indicator to warn the user of an impending power turn-off unless use of the appliance is detected by a use detector. 35

[0008] Document US 6 104 009 discloses an electric clothes iron with circuitry for automatically disabling power to the iron when the iron is left unattended for a certain period of time.

[0009] Document US 6 452 501 discloses an electric heating appliance adapted to signal the shut-off of a heater to a user by an indicator. 40

OBJECT AND SUMMARY OF THE INVENTION

[0010] It is an object of the invention to propose an improved garment care device that avoids or mitigates above-mentioned problems.

[0011] The invention is defined by the independent claims. The dependent claims define advantageous embodiments. 50

[0012] To this end, the garment care device according to the invention comprises:

- a sensor connected to a control unit for generating an output signal characterizing a movement of the garment care device, 55
- a display for displaying a plurality of light indicators,

a) identify some movement characteristics in said output signal, said movement characteristics reflecting that the garment care device is moving, wherein said movement characteristics correspond to the amount of a linear displacement along a given direction of the garment care device,

b) control the switching of said plurality of light indicators, based on the movement characteristics, and

c) switch said plurality of light indicators (303) according to a given light pattern, and characterised in that the control unit is adapted to control the switching of a number of light indicators among said plurality of light indicators, said number of light indicators depending on said amount of linear displacement.

[0013] This solution gives to the user a visual feedback on the movement characteristics of the device. First, this visual feedback by the light indicators is informative on the movement characteristics. For example, the visual feedback may indicate that the user is performing short strokes or long strokes. Secondly, the visual feedback is also helpful for user to modify the way the device is moved. For example, if the switching of the light indicators is such that it reflects that the movement of the device characterizes short strokes, the user may decide to move the device with longer strokes, in particular if he knows that the device can enter a specific operating mode associated with long strokes.

[0014] The invention also relates to a method of controlling at least one light indicator in a garment care device as mentioned above.

[0015] Detailed explanations and other aspects of the invention will be given below.

BRIEF DESCRIPTION OF THE DRAWINGS

[0016] Particular aspects of the invention will now be explained with reference to the embodiments described hereinafter and considered in connection with the accompanying drawings, in which identical parts or sub-steps are designated in the same manner : 45

Fig.1 depicts a first embodiment of a garment care device according to the invention,

Fig.2 depicts a display for displaying at least one light indicator in a garment care device according to Fig.1,

Fig.3 depicts a second embodiment of a garment care device according to the invention,

Fig.4 depicts a display for displaying at least one light indicator in a garment care device according to Fig.3,

Fig.5A-5B illustrate examples of a signals generated

by an accelerometer used in a garment care device according to the invention,
Fig.6 depicts a flow chart of a method according to the invention.

DETAILED DESCRIPTION OF THE INVENTION

[0017] Fig.1 depicts a first embodiment of a garment care device 100 according to the invention.

[0018] The garment care device 100 comprises a sensor 101 connected to a control unit 104 for generating an output signal characterizing a movement of the garment care device.

[0019] The garment care device also comprises a display 102 for displaying at least one light indicator 103.

[0020] The control unit 104 is adapted to:

- a) identify some movement characteristics in the output signal, said movement characteristics reflecting that the garment care device is moving,
- b) control the switching of said at least one light indicator 103, based on said movement characteristics
- c) switch said at least one light indicator (303) according to a given light pattern.

[0021] This also applies to the device depicted in Fig.3.

[0022] For example, the light indicators 103 correspond to surface-mounted light-emitting diodes ("LED"). Alternatively, the light indicators correspond to discrete LEDs or a LED module.

[0023] For example, the sensor 101 is an accelerometer of the type Micro Electro-Mechanical Systems (MEMS) which is adapted to generate at least one acceleration signal along any axis X, Y, Z forming an orthonormal reference, with Z corresponding to a vertical direction, and X-Y forming a horizontal plan.

[0024] To generate steam, the garment care device depicted in Fig. 1 comprises a water tank 105, a steam generator 106 receiving water from the reservoir 105. The steam generated in the steam generator 106 exits via steam vents 107 arranged in the soleplate S. In order to control the amount of steam generated, a water pump 108, preferably controlled by control unit 104, is used to carry water from the water tank 105 to the steam generator 106.

[0025] Preferably, the sensor 101 is arranged in a handle 109. By doing so, the risk of damaging the sensor 101, for example as a result of water leaking from the reservoir 105, maybe reduced. Furthermore, an additional protective housing (not shown) may provide additional protection to the sensor 101 (and/or control unit 102).

[0026] Controlling the switching of the light indicators means any one of the following type of control:

- switching-on to full brightness,
- switching-off,
- increasing the light intensity by a certain percentage,
- decreasing the light intensity by a certain percent-

age.

[0027] The brightness of a given light indicator is illustrated in Fig.2 and Fig.4 by a blacken surface (total or partial) of the corresponding light indicator.

[0028] Fig.2 depicts a display 102 for displaying a plurality of light indicators in a garment care device according to Fig.1.

[0029] In this example, for sake of simplifying the explanation, only two light indicators are arranged, a first light indicator 103a, a second light indicator 103b. However, a larger number of light indicators could be used similarly.

[0030] Preferably, the light indicators have different sizes.

[0031] The movement characteristics correspond to the amount of a linear displacement along a given direction (D) of the garment care device.

[0032] The amount of a linear displacement may preferably correspond to the length of the user's stroke in this given direction (D) when using the garment care device.

[0033] For example, the given direction (D) correspond to the X axis.

[0034] Fig.5A is an illustration of an example of a signal AS generated by a sensor 101 used in a garment care device according to the invention.

[0035] In the present case, the sensor 101 is an accelerometer, and the output signal generated by the sensor 101 is an acceleration signal AS varying along the time in the given direction D, such as, for example, the X axis. The unit for the vertical axis of the graph is in milli g (or abbreviated as "mg"), with $1\text{ g} = 9.81\text{ m/s}^2$.

[0036] The characteristics of the output signal correspond to the time interval d1 between two consecutive zero-crossing points of the output signal. In order to classify the length of the user's stroke, the time interval d1 is compared to a given duration threshold d0:

- if the measured time interval d1 is smaller than the given duration threshold d0, the stroke of the user using the garment care device is considered as a short stroke.
- if the measured time interval d1 is larger than the given duration threshold d0, the stroke of the user using the garment care device is considered as a long stroke.

[0037] The given duration threshold d0 corresponds to the average value of the time interval between two consecutive zero-crossing points of the output signal corresponding to an average value of a user's stroke length.

[0038] By definition, the stroke length along a given direction D, corresponds to the linear distance of the garment care device between a starting position with zero speed, to the next position with zero speed.

[0039] By definition, the average value of a stroke length of a user is the average linear distance that allows

classifying a stroke length between a short stroke and a long stroke. A short stroke is smaller than the average linear distance, a long stroke is larger than the average linear distance.

[0040] The garment care device is preferably adapted to modify characteristics of some operating modes of the device, based on whether a short or long stroke is detected. For example the temperature of a soleplate can be varied, the temperature of a steam chamber can be varied, the amount of steam generated can be varied accordingly.

[0041] It is noted that in case the output signal generated by the sensor 101 contains a certain level of noise, for example ± 50 mg, the time interval $d1$ between two consecutive zero-crossing points of the output signal should be calculated with an offset corresponding to the estimated value of the noise level. An example is illustrated in Fig.5B.

[0042] Preferably, the given duration threshold $d0$ has a value in the range [200; 800] ms, preferably 550 ms.

[0043] The control unit 104 is adapted to control the switching of a number of light indicators, and the number of light indicators depends on the amount of linear displacement (i.e. distance).

[0044] In particular, the number of light indicators which are switched to full brightness is smaller if the amount of linear displacement is below a given threshold, than the number of light indicator which are switched to full brightness if said amount of linear displacement is above said given threshold. The given threshold corresponds to the linear displacement value between a short stroke and a long stroke.

[0045] For example:

- if short stroke is detected, one light indicator is switched-on.
- if long stroke is detected, two light indicators are switched-on.

[0046] Alternatively:

- if short stroke is detected, one light indicator is switched to full brightness, and one light indicator is switched-on with partial brightness, as shown in the view (b) of Fig.2,
- if long stroke is detected, two light indicators are switched to full brightness, as shown in the view (c) of Fig.2.

[0047] Preferably, the movement characteristics reflect that the garment care device is not moving.

[0048] For example, a no moving state of the garment care device can be detected by measuring the acceleration signal(s) along any one of axis X, Y, Z. In particular, if along a given axis, the acceleration signal has a value lower than 50 mg (or more generally the noise level), with $1\text{ g} = 9.81\text{ m/s}^2$, it can be considered that the device is not moving along this given axis.

[0049] The no moving state of the garment care device can be detected along one or a plurality of axis X, Y, Z. If a plurality of axis is considered, the acceleration signal must have a value lower than 50 mg along each of those axis in order to conclude that the garment care device is not moving.

[0050] Preferably, if a no moving state of the garment care device is detected, the control unit 104 is adapted to switch at least one light indicator among said plurality of light indicators 103. This also applies to device depicted in Fig.3.

[0051] For example, if a no moving state of the garment care device is detected:

- only one light indicator, for example light indicator 103a, is switched with a brightness less than the full brightness, as illustrated in view (a) of Fig.2, or
- all light indicators are switched with a full brightness as illustrated in view (c) of Fig.2.

[0052] According to the invention, the movement characteristics reflect that the garment care device is moving.

[0053] For example, a moving state of the garment care device can be detected by measuring the acceleration signal(s) along any one of axis X, Y, Z. In particular, if along a given axis, the acceleration signal has a value larger than 50 mg (or more generally the noise level), with $1\text{ g} = 9.81\text{ m/s}^2$, it can be considered that the device is moving along this given axis, so overall moving.

[0054] According to the invention, if a moving state of the garment care device is detected, the control unit 104 is adapted to switch a number of light indicators 303 according to a given light pattern, wherein said given light pattern corresponds to a given number of said plurality of light indicators being switched. Other light patterns not forming part of the claimed invention correspond to a light brightness pattern; or a knight rider effect.

[0055] In the case where the light pattern corresponds to a given number of said plurality of light indicators being switched, the light indicator(s) may be switched on or off according to the detected movement of the device. The exact number of light indicators vary depending on the detected movement.

[0056] In the example where the light pattern is light brightness pattern, the brightness of the light indicator(s) may be varied according to the detected movement of the device. In the example of a single light indicator, there may be multiple levels of brightness the indicator may occupy according to the detected movement of the device. Alternatively, in the case where there are multiple light indicators, the brightness of each indicator may be altered to a predefined pattern in response to a given detected motion.

[0057] Fig.3 depicts a second embodiment of a garment care device 300 according to the invention. This embodiment comprises an iron 301 cooperating with a base unit 302 via a hose cord 308. The base unit 302 comprises a water reservoir 304, a boiler 307 and a water

pump 305 for providing water from the water reservoir 304 into the boiler 307. The boiler 307 generates steam as fluid in the hose cord 308. Steam which reaches the iron 301 is further heated in the steam generator 106. The control unit 104 is preferably arranged in the base unit 302, and communicate with the sensor 101 via a wire embedded inside the hose cord 308. The hose cord 308 is also adapted to carry power supply to the steam generator 106.

[0058] The garment care device also comprises a display 302 for displaying a plurality of light indicators 303, which works similarly as the display 102 described above. One difference is that the number of light indicators is larger (i.e. five light indicators 303a, 303b, 303c, 303d, 303e). The display 302, the sensor 101 and the control unit 104 work similarly as in the embodiment of Fig.1.

[0059] According to the invention, if a moving state of the garment care device 300 is detected, in particular a moving state of the iron 301, the control unit 104 is adapted to switch the plurality of light indicators 303 according to a given light pattern.

[0060] According to an example not forming part of the claimed invention, the light pattern is a knight rider effect. The knight rider effect is characterized by the fact that at any given time, one of the light indicators is fully bright and the neighbouring two light indicators have limited brightness, for example 30%. The rest of the light indicators are switched-off. The position of the fully bright light indicator on the display 302 is shifted overtime according to the sequence of display shown in Fig.4: (b), (c), (d), (e), (f), (e), (d), (c), (b), etc...

[0061] In other words, the knight rider effect is defined as a lighting sequence, wherein at a first stage in the lighting sequence a single light indicator of a plurality of light indicators is lit to full brightness, the light indicators adjacent the lit indicator are lit to limited brightness and the remaining indicators are turned off as shown in Figure 4(b). In the second stage of the lighting sequence, one of the limited brightness indicators is lit to full brightness, the indicators adjacent this indicator are lit to a limited brightness and the remaining indicators are turned off as shown in Figure 4(c). This transition gives the visual effect of the fully lit indicator having shifted to an adjacent indicator in a first direction as shown by the transition from Figure 4(b) to Figure 4(c). This transition is sequentially repeated until the fully lit indicator is the last indicator in the first direction, i.e. there are no further adjacent light indicators in said first direction as shown in Figure 4(f). At this point, the direction of progression is reversed and the fully lit indicator progresses in a sequential manner along a second direction, opposite to the first direction as shown in the transition from Figure 4(f) to Figure 4(e). The transition described above is performed in the second direction until the fully lit indicator is the last indicator in the second direction. This above described lighting sequence may then be repeated, alternating between the first and second directions. Thus, the knight rider ef-

fect provides the visual effect of a fully lit light indicator progressing back and forth in a stepwise manner across a plurality of light indicators.

[0062] According to an example not forming part of the claimed invention, the movement characteristics correspond to the speed of displacement (i.e. velocity) along a given direction (D) of the garment care device. For example, this applies to devices depicted in Fig.1 and Fig.3. For example, the speed of displacement can be obtained by integrating the corresponding acceleration signal(s).

[0063] Preferably, according to this example the control unit 104 is adapted to control the switching of a number of light indicators among said plurality of light indicators 103, 303, while having the number of light indicators depending on the speed of displacement.

[0064] For example, the number of light indicator which are switched (with full or partial brightness), is proportional to the speed of displacement. In other words, the higher the speed of device, the larger the number of light indicators which are switched.

[0065] Preferably, the garment care device corresponds to any one of the following types:

- dry iron,
- steam iron, as depicted in Fig.1,
- pressurized steam generator (with base connected to an iron via a hose cord, either the hose carrying water, either the hose cord carrying steam as depicted in Fig.3),
- handheld garment steamer,
- stand garment steamer.

[0066] Fig.6 depicts a flow chart of a method according to the invention of controlling a plurality of light indicators in a garment care device, such as a garment care device depicted along with Fig.1 and Fig.3. The method comprises the steps of:

- generating 601 an output signal characterizing a movement of said garment care device,
- identifying 602 some movement characteristics in said output signal,
- control 603 the switching of said at least one light indicator, based on said movement characteristics.

[0067] According to the claimed invention, the step of identifying 602 comprises:

- identifying the amount of a linear displacement along a given direction (D) of the garment care device.

[0068] According to examples not forming part of the claimed invention, the step of identifying 602 comprises:

- identifying that the garment care device is not moving, or
- identifying that the garment care device is moving, or
- identifying the speed of displacement along a given

direction (D) of the garment care device.

[0069] In a further example, the control unit (104) may be adapted to:

- a) identify some movement characteristics in said output signal, said movement characteristics reflecting that the garment care device is not moving, and
- b) control the switching of at least one light indicator (103, 303) according to a given light pattern.

[0070] The given light pattern according to this example may correspond to either:

- a given number of said at least one light indicator being switched, or
- a light brightness pattern.

[0071] The above embodiments as described are only illustrative, and not intended to limit the technique approaches of the present invention. Although the present invention is described in details referring to the preferable embodiments, those skilled in the art will understand that the technique approaches of the present invention can be modified or equally displaced without departing from the protective scope of the claims of the present invention. In the claims, the word "comprising" does not exclude other elements or steps, and the indefinite article "a" or "an" does not exclude a plurality. Any reference signs in the claims should not be construed as limiting the scope.

Claims

1. A garment care device (100) comprising:

- a sensor (101) connected to a control unit (104) for generating an output signal characterizing a movement of said garment care device,
- a display (102, 302) for displaying a plurality of light indicators (103, 303), wherein the control unit (104) is adapted to:

- a) identify some movement characteristics in said output signal, said movement characteristics reflecting that the garment care device is moving, wherein said movement characteristics correspond to the amount of a linear displacement along a given direction (D) of the garment care device,
- b) control the switching of said plurality of light indicators (103, 303), based on said movement characteristics, and
- c) switch said plurality of light indicators (303) according to a given light pattern,

and **characterised in that** the control unit (104)

is adapted to control the switching of a number of light indicators among said plurality of light indicators (103, 303), said number of light indicators depending on said amount of linear displacement.

2. A garment care device as claimed in claim 1, wherein the number of light indicators which are switched to full brightness is smaller if said amount of linear displacement is below a given threshold, than the number of light indicators which are switched to full brightness if said amount of linear displacement is above said given threshold.

3. A garment care device as claimed in any of claims 1 to 2, wherein said sensor (101) is an accelerometer of the type Micro Electro-Mechanical Systems (MEMS).

4. A garment care device as claimed in any of claims 1 to 3, corresponding to any of the types defined by dry iron, steam iron, pressurized steam generator, handheld steamer, stand garment steamer.

5. Method of controlling plurality of light indicators in a garment care device, the method comprising the steps of:

- generating (601) an output signal characterizing a movement of said garment care device,
- identifying (602) some movement characteristics in said output signal, wherein said movement characteristics correspond to the amount of a linear displacement along a given direction (D) of the garment care device,
- controlling (603) the switching of said plurality of light indicators, based on said movement characteristics
- and **characterised in that** the method further includes controlling the switching of a number of light indicators among said plurality of light indicators, said number of light indicator depending on said amount of linear displacement.

Patentansprüche

1. Kleidungspflegevorrichtung (100), umfassend:

- einen Sensor (101), der mit einer Steuereinheit (104) verbunden ist, um ein Ausgangssignal zu erzeugen, das eine Bewegung der Kleidungspflegevorrichtung charakterisiert;
- eine Anzeige (102, 302) zum Anzeigen einer Vielzahl von Lichtanzeigen (103, 303), wobei die Steuereinheit (104) angepasst ist zum:

a) Identifizieren einiger Bewegungseigen-

schaften in dem Ausgangssignal, wobei die Bewegungseigenschaften widerspiegeln, dass sich die Kleidungspflegevorrichtung bewegt, wobei die Bewegungseigenschaften dem Betrag einer linearen Verschiebung entlang einer gegebenen Richtung (D) der Kleidungspflegevorrichtung entsprechen;

b) Steuern des Schaltens der mehreren Lichtindikatoren (103, 303) basierend auf den Bewegungseigenschaften und

c) Schalten der Vielzahl von Lichtindikatoren (303) gemäß einem gegebenen Lichtmuster,

und **dadurch gekennzeichnet, dass** die Steuereinheit (104) dazu angepasst ist, das Schalten einer Anzahl von Lichtindikatoren unter den mehreren Lichtindikatoren (103, 303) zu steuern, wobei die Anzahl von Lichtindikatoren von dem Betrag der linearen Verschiebung abhängt.

2. Kleidungspflegevorrichtung nach Anspruch 1, wobei die Anzahl der Lichtindikatoren, die auf volle Helligkeit geschaltet werden, kleiner ist, wenn der Betrag der linearen Verschiebung unter einem gegebenen Schwellenwert liegt, als die Anzahl von Lichtindikatoren, die auf volle Helligkeit geschaltet sind, wenn der Betrag der linearen Verschiebung über dem gegebenen Schwellenwert liegt.

3. Kleidungspflegevorrichtung nach einem der Ansprüche 1 bis 2, wobei der Sensor (101) ein Beschleunigungsmesser vom Typ Mikroelektromechanische Systeme (MEMS) ist.

4. Kleidungspflegevorrichtung nach einem der Ansprüche 1 bis 3, die einem der Typen entspricht, die durch Trockeneisen, Dampfbügeleisen, Druckdampfzeuger, Handdampfer, Standkleidungsdampfer definiert sind.

5. Verfahren zum Steuern einer Vielzahl von Lichtindikatoren in einer Kleidungspflegevorrichtung, wobei das Verfahren die Schritte umfasst von:

- Erzeugen (601) eines Ausgangssignals, das eine Bewegung der Kleidungspflegevorrichtung charakterisiert,

- Identifizieren (602) einiger Bewegungseigenschaften in dem Ausgangssignal, wobei die Bewegungseigenschaften dem Betrag einer linearen Verschiebung entlang einer gegebenen Richtung (D) der Kleidungspflegevorrichtung entsprechen;

- Steuern (603) des Schaltens der mehreren Lichtindikatoren basierend auf den Bewegungseigenschaften

- und **dadurch gekennzeichnet, dass** das Verfahren ferner das Steuern des Schaltens einer Anzahl von Lichtindikatoren unter den mehreren Lichtindikatoren umfasst, wobei die Anzahl von Lichtindikatoren von dem Betrag der linearen Verschiebung abhängt.

Revendications

1. Dispositif de soins de vêtements (100) comprenant:

- un capteur (101) connecté à une unité de commande (104) pour générer un signal de sortie caractérisant un mouvement dudit dispositif de soins de vêtements,

- un afficheur (102, 302) pour afficher une pluralité de indicateurs lumineux (103, 303), où l'unité de commande (104) est adaptée pour:

a) identifier certaines caractéristiques de mouvement dans ledit signal de sortie, lesdites caractéristiques de mouvement reflétant que le dispositif de soins de vêtements est en mouvement, où lesdites caractéristiques de mouvement correspondent à la quantité d'un déplacement linéaire le long d'une direction donnée (D) du dispositif de soins de vêtements,

b) commander la commutation de ladite pluralité d'indicateurs lumineux (103, 303), sur la base desdites caractéristiques de mouvement, et

c) commuter ladite pluralité d'indicateurs lumineux (303) selon un motif lumineux donné,

et caractérisé en ce que l'unité de commande (104) est adaptée pour commander la commutation d'un certain nombre d'indicateurs lumineux parmi ladite pluralité d'indicateurs lumineux (103, 303), ledit nombre d'indicateurs lumineux dépendant de ladite quantité de déplacement linéaire.

2. Dispositif de soins de vêtements selon la revendication 1, dans lequel le nombre d'indicateurs lumineux qui sont commutés à la pleine luminosité est plus petit si ladite quantité de déplacement linéaire est inférieur à un seuil donné, par rapport au nombre d'indicateurs lumineux qui sont commutés à la pleine luminosité si ladite quantité de déplacement linéaire est supérieure audit seuil donné.

3. Dispositif de soins de vêtements selon l'une quelconque des revendications 1 à 2, dans lequel ledit capteur (101) est un accéléromètre du type micro-systèmes électromécaniques (MEMS).

4. Dispositif de soins de vêtements selon l'une quelconque des revendications 1 à 3, correspondant à l'un quelconque des types définis par un fer à sec, un fer à vapeur, un générateur de vapeur sous pression, un appareil à vapeur portable à main, un appareil à vapeur pour vêtements sur pied. 5

5. Procédé de commande d'une pluralité d'indicateurs lumineux dans un dispositif de soins de vêtements, le procédé comprenant les étapes de: 10

- générer (601) un signal de sortie caractérisant un mouvement dudit dispositif de soins de vêtements,
- identifier (602) certaines caractéristiques de mouvement dans ledit signal de sortie, où lesdites caractéristiques de mouvement correspondent à la quantité d'un déplacement linéaire le long d'une direction donnée (D) du dispositif de soins de vêtements, 15 20
- commander (603) la commutation de ladite pluralité d'indicateurs lumineux, sur la base desdites caractéristiques de mouvement
- et **caractérisé en ce que** le procédé comprend en outre le commande de la commutation d'un certain nombre d'indicateurs lumineux parmi ladite pluralité d'indicateurs lumineux, ledit nombre d'indicateurs lumineux dépendant de ladite quantité de déplacement linéaire. 25 30

35

40

45

50

55

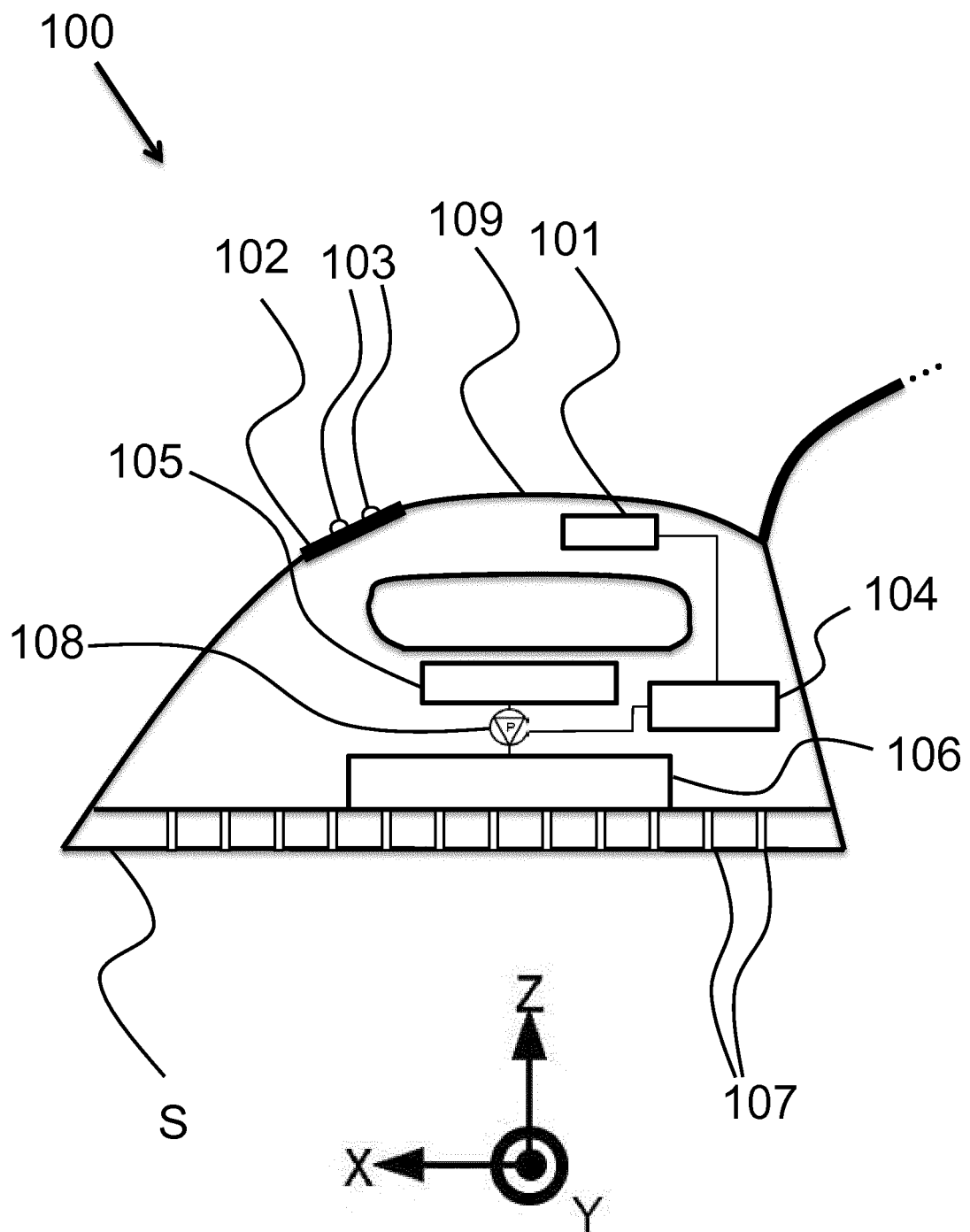


FIG.1

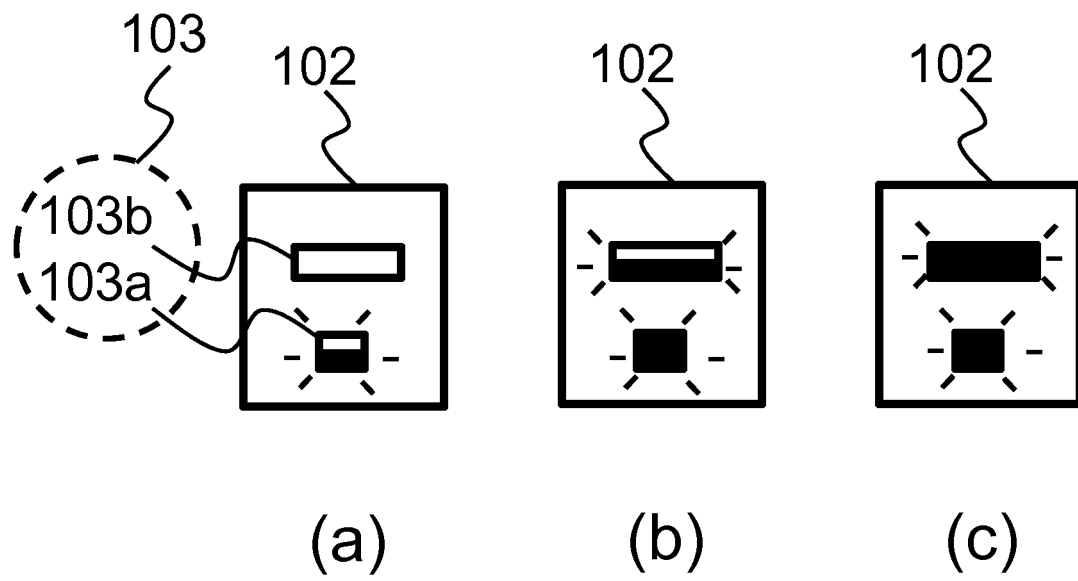


FIG.2

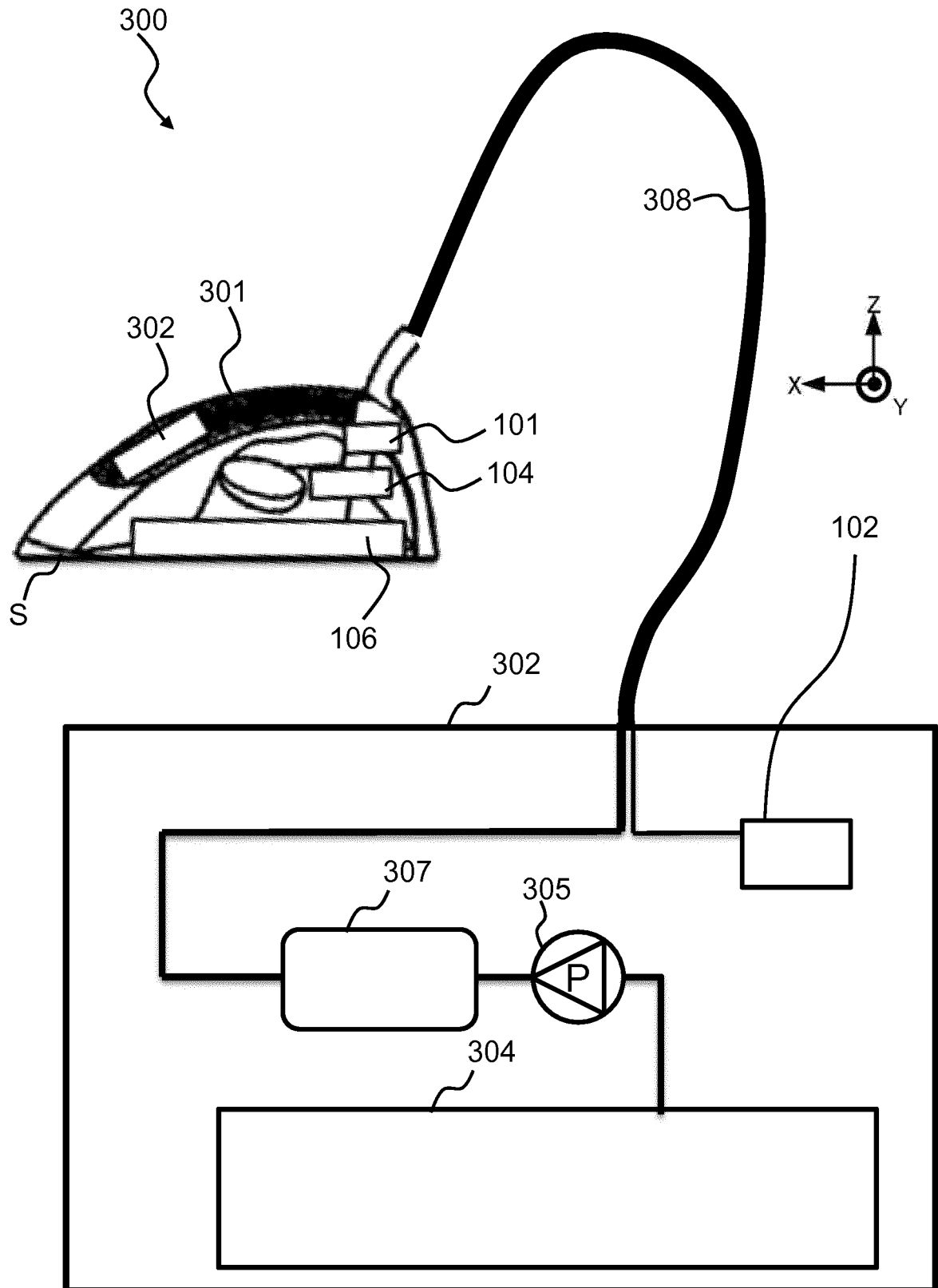


FIG.3

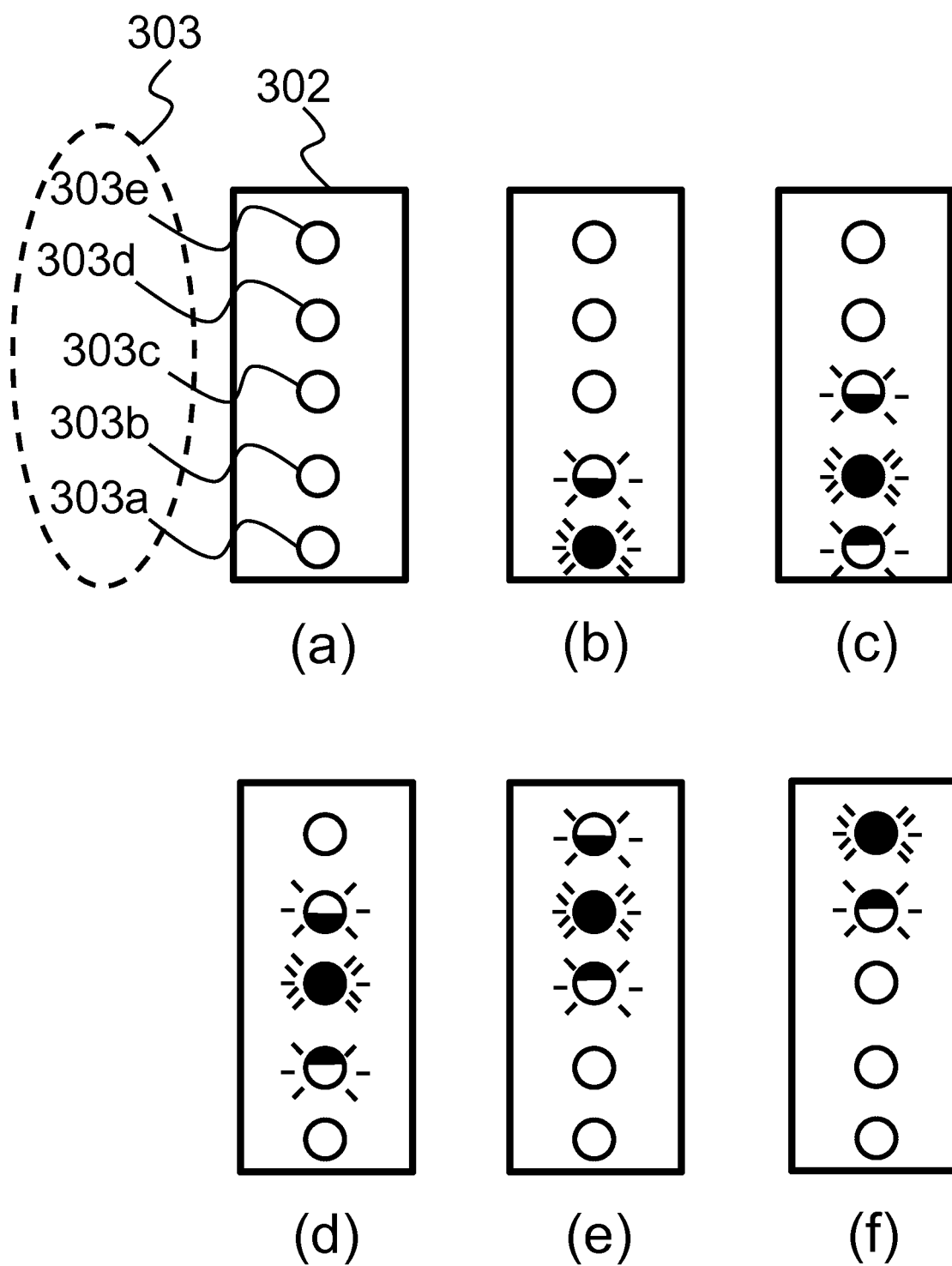


FIG.4

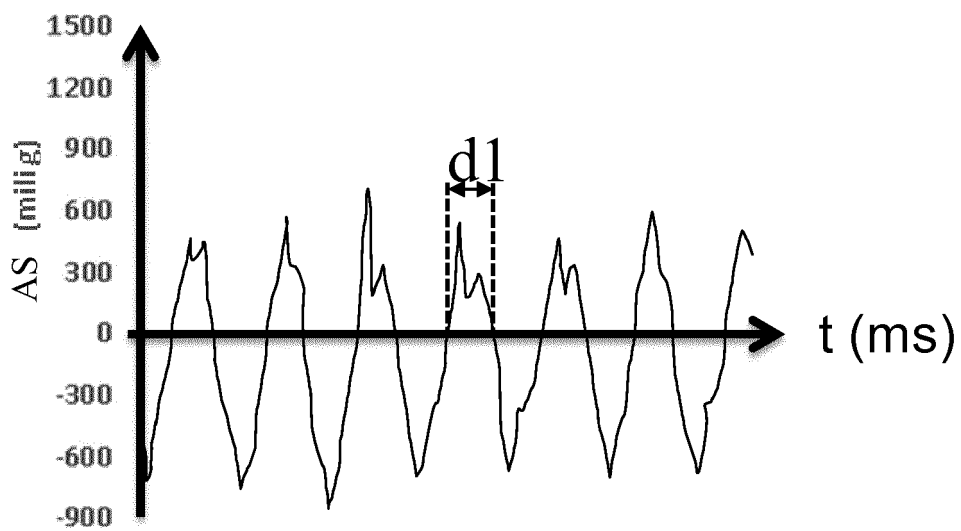


FIG.5A

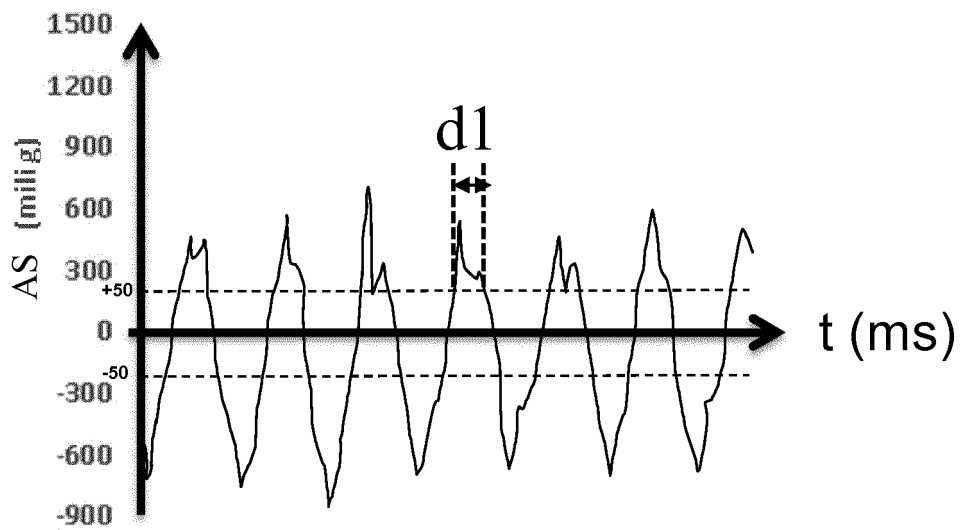


FIG.5B

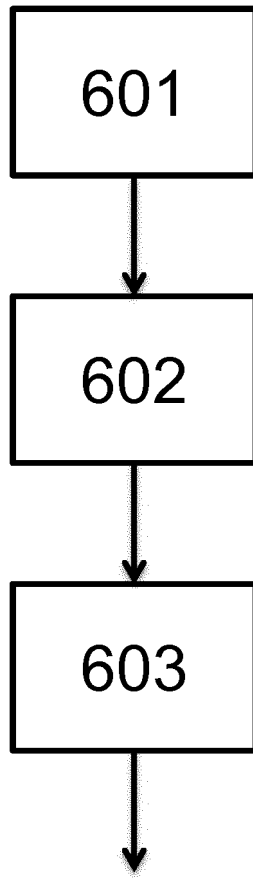


FIG.6

REFERENCES CITED IN THE DESCRIPTION

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