ABSTRACT

A body care appliance is disclosed. The body care appliance includes a toothbrush having a first display; a base station for storing and/or charging the toothbrush; and a second display for displaying interactive representations, which are interactively controllable by means of a control unit from the toothbrush. The second display forms a module that is designed separately from the base station and the toothbrush and is separately positionable; the second display having a communication interface for communication with the base station and/or with the toothbrush.
BODY CARE APPLIANCE FOR PERSONAL NEEDS

CROSS REFERENCE TO RELATED APPLICATIONS

[0001] This application is a continuation of International Application No. PCT/2010/052257, filed May 20, 2010, the substance of which is incorporated by reference in its entirety herein.

FIELD OF THE INVENTION

[0002] The present disclosure relates to a body care appliance for personal needs. More particularly, the present disclosure relates to a hand-guidable care tool, in particular a toothbrush, a base station for storing and/or charging the care tool and a display unit for display of interactive displays which are interactively controllable from the care tool by means of a control unit.

BACKGROUND OF THE INVENTION

[0003] In order to increase the stimulus for regular toothbrushing, displays are provided on tooth-cleaning appliances, on which videogames that are interactively controllable from the toothbrush can be shown. Due to the additional entertainment value, children in particular are motivated to brush their teeth regularly. As an alternative or in addition to entertainment games, instructions for efficient and effective cleaning of teeth may be displayed there, for example, so that the user of the toothbrush goes through the image sequences displayed.

[0004] WO 2007/112112 A1, for example, describes a tooth-cleaning appliance with which a display screen is provided on the base station for charging the toothbrush, videogames being shown on the display during toothbrushing. The videogame is controllable from the toothbrush. Firstly, the toothbrush has manually operable input buttons for input of control commands for the videogame. Secondly, cleaning parameters such as contact pressure and accelerations occurring during the cleaning movements are detected by various sensors on the toothbrush, so that the videogame is controlled on the display screen on the basis of the parameters thus detected. To display a suitable videogame for a particular user, the attachable part of the toothbrush is identified on the basis of an identification code, as a function of which the videogame or its game rules are selected. Although a certain adaptation to the individual user is guaranteed in this way, the degree of personalization and the adaptability to particular needs are limited.

[0005] US 2008/0102553 A1 also discloses a toothbrush designed as an input unit for control of a game console to thereby control a videogame. A sensor attached to the brush detects brush movements, the movement of a virtual game object of the videogame being controlled on the basis of the movement signals of the toothbrush.

[0006] US 2006/0040246 A1 describes an electric toothbrush that can be stored and charged on a base station. The base station has a display on which an interactive game such as PAC-MAN® is displayed. The toothbrush communicates wirelessly with the control unit for controlling the game, which is activated by removing the toothbrush from the base station or by a start button mounted on the toothbrush. Sensors on the toothbrush detect its movements, which are used to control movements of game characters and/or game parts on the display screen. Various memory modules may be used to allow various games to be executed. The more skillfully the user plays the game displayed on the display screen, the more points the user is credited with toward winning the game.

[0007] DE 10153863 A1 discloses a toothbrush having a spherical display part attachable to the shaft end of the toothbrush; the cleaning results detected by sensors may be displayed on this display or a game for children may be displayed here after a successful cleaning operation. However, no interactive control of the game shown on the display from the toothbrush is provided there; instead, the program shown on the display is controlled by input buttons arranged on the display part itself, so the entertainment value and the learning effect are limited. The actual display in the display part is incorporated into the spherical shape of the display part and is covered with a transparent cup-shaped cover made of scratchproof and acid-resistant plastic.

[0008] US 2008/0141478 and US 2008/0141476 disclose additional toothbrushing appliances having a display on which interactively controllable games are displayed, where several toothbrushes are able to communicate with one another to allow games to be played, e.g., “rock-paper-scissors” in competition. However, the displays are mounted on the hand-held part of the toothbrush itself, so that while brushing one’s teeth, it is impossible to play a game that supports proper dental hygiene.

[0009] The goal of this invention is to create an improved body care appliance of the type defined above that avoids the disadvantages of the prior art and improves upon the latter in an advantageous manner. In particular, the interactive controllability of the game displayed on the display screen should be improved in terms of operating convenience and the interaction between different users of the appliance and the display unit should be facilitated.

SUMMARY OF THE INVENTION

[0010] In one embodiment, a body care appliance is provided. The body care appliance includes a toothbrush having a first display; a base station for storing and/or charging the toothbrush; and a second display for displaying interactive representations, which are interactively controllable by means of a control unit from the toothbrush. The second display forms a module that is designed separately from the base station and the toothbrush and is separately positionable; the second display having a communication interface for communication with the base station and/or with the toothbrush.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] The embodiments set forth in the drawings are illustrative in nature and not intended to limit the invention defined by the claims. The following detailed description of the illustrative embodiments can be understood when read in conjunction with the following drawings, where like structure is indicated with like reference numerals and in which:

[0012] FIG. 1 shows a schematic diagram of a body care appliance in accordance with one embodiment, including a toothbrush and a display unit for display of an interactively controllable toothbrushing game, both of which can be loaded onto a base station;

[0013] FIG. 2 shows a schematic diagram of the sequence of the interactively controllable toothbrushing game on the
screen of the display unit, whereby said display unit is shown in multiple displays at various times during the game;

[0014] FIG. 3 a schematic view of the toothbrush stored on the base station, showing its rocking motion on the base station to illustrate the magnetically operating holding means;

[0015] FIG. 4 shows a detailed diagram of a manually operable navigation switch on the toothbrush for controlling the avatar of the interactively controllable game.

DETAILED DESCRIPTION OF THE INVENTION

[0016] The following text sets forth a broad description of numerous different embodiments of the present disclosure. The description is to be construed as exemplary only and does not describe every possible embodiment since describing every possible embodiment would be impractical, if not impossible. It will be understood that any feature, characteristic, component, composition, ingredient, product, step or methodology described herein can be deleted, combined with or substituted for, in whole or part, any other feature, characteristic, component, composition, ingredient, product, step or methodology described herein. Numerous alternative embodiments could be implemented, using either current technology or technology developed after the filing date of this patent, which would still fall within the scope of the claims. All publications and patents cited herein are incorporated herein by reference.

[0017] According to the present disclosure, a display unit, despite its controllability from the care tool, should not be arranged fixedly on the base station or fixedly on the care tool but instead should be designed to be freely placeable, so that it can be stored in the best location respectively. According to one embodiment, the display unit forms a module that is designed separately and is separately positionable from the base station and the care tool and has a communication interface for communication with the base station and/or with the care tool even when separate. Due to the design of the display unit as a stand-alone module, the display unit may also be positioned in a location where it is readily visible for the child or an adult regardless of the position of the base station, so that visibility is good even with a back-and-forth movement of the care tool as intended, corresponding to the tooth-brushing movements in the mouth in the case of a toothbrush. Nevertheless, the screen display, in one embodiment, in the form of a videogame, can be controlled interactively from the care tool via the communication interface of the display. To do so, the care tool may have a communication link directly to the display module or may communicate with it indirectly via the base station.

[0018] To achieve a simple and efficient energy supply for the display unit despite the free placeability of the display unit without an action radius that depends on the base station, in one embodiment, the display unit is provided with a chargeable energy storage mechanism which is chargeable by docking the display unit on the base station. To this end, the display unit may have an energy-transmitting coupling unit, which can be brought into operative connection with a coupling device provided on the base station. The display unit and the base station have mutually compatible charging terminals by which the energy storage mechanism in the display unit can be charged from the base station.

[0019] The energy-transmitting coupling device for charging the energy storage mechanism of the display unit may operate without contact, although mechanically connectable charging terminals may also be provided in principle. In a further embodiment, the display unit may have an inductive charging terminal for inductive charging from the base station, whereby the latter also has an inductive charging terminal that is compatible with the inductive charging terminal on the display unit. By providing charging coils that communicate with one another on the display and on the base station, no mechanical terminals need be connected for charging the display. Furthermore, the inductive charging terminal on the display unit and/or on the base station can be protected by a seal, for example, moisture-proof, in particular being arranged beneath an appliance housing, so that operation even in humid rooms such as bathhouses and shower rooms is also possible without any problems.

[0020] In a further embodiment, both the display unit and the care tool can be charged on the base station. It may be fundamentally sufficient if the base station therefore has only one charging terminal when the charging terminals that communicate with it are designed similarly on the display unit and the care tool accordingly, so that optionally the care tool or the display unit can be charged.

[0021] However, the base station may have two separate charging terminals, one of which can be brought into operative connection with the display unit and the other of which can be brought into operative connection with the care tool, such that the display unit and the care tool can both be charged simultaneously.

[0022] In one embodiment, both the charging terminal for the display unit and the charging terminal for the care tool are designed to operate inductively, in particular being provided with a charging coil which can be brought into a current-transmitting connection with a charging part that fits it on the display unit and/or on the care tool.

[0023] In this way, both the display unit and the care tool can be stored and/or placed on the base station in the idle state and/or when not in operation, thereby charging them in the idle state. For operation, the care appliance such as the toothbrush and the display can be picked up from the base station to allow operation independently of the base station. The display unit may also be operated even when it is docked on the base station and/or may communicate with the care tool in such a way that the display unit can be operated optionally on the base station or independently thereof. Operation on the base station may be advantageous, for example, when the energy storage mechanism of the display unit has only a low charge.

[0024] In a further embodiment, the display unit has standing means for placing it on a flat surface and on the other hand has shape-adapted bearing means that conform to the shape of the base station for supporting the display on the base station in an accurately fitted manner. The display unit may be docked on the base station in a form-fitting manner by means of the aforementioned shape-adapted bearing means. In a further embodiment, the aforementioned standing means for placing the display unit on a flat surface and the bearing means for docking the display unit on the base station may be integrated into one another and/or may be designed to be mutually complementary. For example, protruding feet may be inserted into receiving troughs on the base station having a complementary shape.

[0025] To be able to minimize the transmission power and not require a high data traffic, in a further embodiment, a game controller may be integrated into the display unit for controlling a videogame displayable on the display unit, so that only control commands for interactive control of the
The transmitted control commands coming from the care tool may comprise a display unit mounted on the care tool itself, for example, to point out special events in addition to the display unit designed separately or to convey other information. In a further embodiment, the care tool may include a display, which can be controlled by a control unit as a function of the game running on the separate display unit and/or as a function of an operating parameter of the care tool itself. For example, the display provided on the care tool itself may be used to draw attention to game situations that are especially interesting or important on the separate display unit.

The display unit on the tool end may be designed to be fundamentally different, so that in a further embodiment, display means simpler than those provided on a separate display unit are provided on the body care tool itself. In a further embodiment, the body care tool may have a lightable housing section and/or a light element that can be attached to the tool housing. With a body care tool in the form of a toothbrush, in a further embodiment, a light ring may be provided on the end of the hand-held piece; said light ring can be converted to various lighting states such as flashing and/or to different colors.

In a further embodiment, if the display on the tool end is controlled as a function of the game running on the separate display unit, then when the game on the separate display unit expects or requires a control command as input, for example, a signal may be delivered on the display on the tool end, for example, in the form of a blinking light.

The display element of the separate display unit may include an electronic display panel, for example, an LCD screen. According to another embodiment, the care tool and/or the separate display unit is positionable on the base station in a stationary but movable position. The bearing device provided for this purpose may fundamentally be designed in different ways, for example, may comprise a spring bearing which allows rocking or see-sawing or some other movement of the display unit and/or care tool on the base station in the supported state due to the change in shape of the bearing springs.

In a further embodiment, the movable bearing device includes shape-adapted bearing surfaces on the one hand on the display unit or the care tool for movable bearing of the display unit and/or the care tool on the base station, and, on the other hand, on the base station includes holding means, for example, magnetic, for magnetic holding of the display unit and/or the care tool on the base station.

In particular, the shape-adapted bearing surfaces may include oppositely curved bearing surface pairs such that at least one shape-adapted bearing surface is designed as a rocking surface having a multiaxial curvature, in particular an egg-shaped curvature for rocking the care tool and/or the display unit in various storage positions, such that said magnetic holding means advantageously form a centering device for centering the display unit resting on the rocker surface and/or the care tool resting on the rocker surface and/or a restoring device for restoring it to a neutral position after deflection.

In particular, a care tool designed as a toothbrush may have a cup-shaped and/or egg-shaped curvature on one end of the hand-held piece, which can be placed in a receiving
trough on the base station. The magnetic holding means hold the toothbrushes in an upright idle position centered in the bearing shell.

[0038] The magnetic holding means may be arranged coaxially with the inductive charging coils described previously in a further embodiment. In another embodiment, the magnetic holding means may also be formed by the charging coil itself so that the inductively transmitted charging current at the same induces magnetic forces in the care tool acting to center and/or hold the care tool to hold it in an upright charging position. In this way, the charging terminals at the same time act as display means which display correct placement on the base station. If the care tool is set down incorrectly, so that no charging current flows, the care tool will fall over and/or it will not be held in its proper idle position. In this regard, setting down the care tool may serve as part of the interactive game and/or as a supplement and continuation of the game being played on the display screen of the display unit.

[0039] According to another embodiment, the display unit may fulfill a double function and may form an electronic picture frame into which images can be input and displayed by a connectable image source independently of the toothbrushing device.

[0040] FIG. 1 shows a toothbrushing appliance 1 which includes an electric toothbrush 2, which has a hand-held piece 3 forming a handle piece and an attachable part 4 detachably connected to the former, the attachable part being an attachable brush with a bristle field 5 in the embodiment shown here, but optionally also being other cleaning elements such as plastic strips, interdental tooth-cleaning appliances or the like.

[0041] A drive motor, which can be driven by a suitably designed drive train of the bristle field 5 of the attachable part 4, is accommodated in the interior of the hand-held piece 3. An energy-storing mechanism in the form of a battery which can be charged via a charging terminal 6 is also provided in the interior of the hand-held piece 3. Said charging terminal 6 is advantageously located on an end section at the rear of the hand-held piece 3 with which it can be stored and/or deposited on a base station 7, so that it can be cleared out of the way when not in use while being charged.

[0042] As shown in FIG. 3, the toothbrush 2 stands upright on the station body 8 of the base station 7, designed essentially in the manner of a flat plate, whereby according to an embodiment, the upright stand is achieved without a locking form-fitting connection or the like, so that the upright toothbrush 2 can rock back and forth, as illustrated in FIG. 3.

[0043] Therefore, a bearing surface pair 10 having an adapted shape and forming a pair of rocking surfaces with multiaxial curves whose surface segments conform to one another is provided as bearing means 9. In the embodiment shown here, the bearing surface 10a of the station body 8 may be designed as a rotationally symmetrical trough, while the end face of the hand-held piece 3 of the toothbrush 2 forms an egg-shaped or cup-shaped surface segment or a rotationally symmetrical convex surface segment that conforms to said bearing trough 10a. One or both of the bearing faces 10a and/or 10b may have a flattened area to permit centered standing.

[0044] To keep the toothbrush 2 in its upright standing position when stored, magnetic holding means 11 are provided in the area of the bearing means 9, acting between the toothbrush 2 and the base station 7 and having a centering effect, holding the toothbrush 2 in its upright vertical idle position. The magnetic holding means 11 may have a permanent magnet in the base station 7, acting on a metallic bearing element, for example, in the form of a bearing ring in the end piece of the hand-held piece 3. The magnetic holding means 11 may be designed so that a restoring torque acts on the hand-held piece 3 when the hand-held piece 3 is deflected out of its centered idle position. This restoring device can be formed by the magnetic holding means 11 in the embodiment shown here.

[0045] The toothbrush 2 may be inductively charged by the base part 7. The charging terminal 6 of the hand-held piece 3 may be designed to operate inductively, as is a charging terminal 12, which is provided on and cooperates with the base station 7. Both charging terminals 6 and 12 may be covered and/or encapsulated with respect to the environment. In particular, they may be arranged beneath the housing of the hand-held piece 3 and/or the base station 7, so the charging current is transmitted without contact. In order for the magnetic fields of the standing device not to be superimposed mutually on the electromagnetic alternating field and cause attenuation, both devices may be arranged so that they are “nested” relative to one another. For example, in one embodiment, the standing magnet is designed to surround the inductive coils for the electromagnetic coupling (for transmission of the charging current). In another embodiment, an inverted arrangement with the coil surrounding the standing magnets is also provided. The standing magnet may be arranged in the base station and/or in the lower section of the handle. This subject of inductive energy transfer with the standing magnet can be combined with other embodiments as desired.

[0046] In one embodiment, the base station 7 also serves as a set-down surface for a display unit 13, including an electronic display element 14 in the form of a screen, i.e., display, optionally designed as an LCD, for example.

[0047] The aforementioned display unit 13 is embodied here as a stand-alone unit, separately from the base station 7, and can be docked on the base station 7 to be charged there, but may also be operated separately at a distance from the base station 7.

[0048] The display unit 13 in the embodiment shown here comprises a base body 15, which forms the bottom of the display unit 13 and supports the display element 14. In an embodiment, a transparent covering bell 16 is inverted over said display element 14, covering and/or encapsulating said display element 14 and connected by a fluid connection to said base body 15, thereby embedding the display element 14 beneath the covering bell 13.

[0049] An energy storage mechanism in the form of a battery, which is chargeable via a charging terminal 17 from the base station 7, may be integrated into the base body 15 as the power supply to the display element 14. The charging terminal 17 on the display unit 13 and the charging terminal 18 of the base station 7 cooperating with the former may be designed to operate inductively, so that the charging current can be transmitted without contact and the charging terminals 17 and/or 18 are embedded to protect them from moisture, in particular being covered beneath the housing of the respective part. FIG. 1 shows that the bottom side of the base body 15 of the display unit 13 forms a set-down surface with which the display unit 13 can be stored on any flat surface. The display unit 13 can communicate with the toothbrush 2 via a communication interface 19 (not shown here). For wireless communication, a transmitter/receiver module is provided on the display unit 13, with which a corresponding transmitter/re-
ceiver module in the hand-held piece 3 of the toothbrush can communicate, so that data can be transmitted in both directions. For example, a Bluetooth interface may be provided on the display unit 13 and on the toothbrush 2 to establish a Bluetooth connection between the two parts.

[0050] The display unit 13 also has a control unit 20, which controls the displays on the display element 14 and converts control commands received from the hand-held piece 3 of the toothbrush 2 into corresponding graphic commands for the screen display. For example, the control unit 21 may show a videogame on the display element 14 and may control it interactively, as shown in the example in FIG. 2.

[0051] At least one avatar 22 and/or a virtual element that can be moved and/or guided over the screen and/or moved and/or guided over the screen background may be shown on the display element 14. In the embodiment shown here, the avatar 22 is formed by the figure of a child, which can be moved over an island and into the underwater world near the island to clean an underwater reef, representing the teeth of a set of teeth to be cleaned. The avatar 22 can be navigated by the toothbrush 2 over the screen display and/or the display element 14. To do so, the hand-held piece 3 of the toothbrush 2 includes navigation control means for creating navigation commands, which are transmitted to the control unit 21 over said communication interface 19 and/or 20 and control the movement of the avatar 22 on the display element 14. In the embodiment shown here in FIG. 4, said navigation control means includes a manually operable navigation switch 23, which may be designed to be fundamentally different and may be embodied as in a trackball, such as those known for use on a laptop, for example, to recognize operations and/or forces acting in different directions and convert them into navigation control signals in various directions.

[0052] To simplify navigation of the avatar 22 for children, the navigation switch 23 on the hand-held piece 3 may be designed as a four-fold pressure switch having pressure sections oriented in four directions, positioned with respect to one another in the form of a cross. By depressing one or two pressure segments situated side by side, a navigation control signal in a corresponding direction, optionally also superimposed, can be created and converted into a movement of the avatar in the corresponding direction. A fixed directional assignment between the pressure sections and the display screen may be provided here, for example, such that depressing the pressure segment directed toward the attachable part 4 always produces a movement of the avatar 22 upward toward the upper edge of the display screen. Alternatively, the directional orientation may also depend on the alignment of the brush shown in the virtual display, such that the virtual display of the brush is always moved to the right across the longitudinal axis of the virtual brush display regardless of its rotational position on the display screen, for example, when the pressure segment situated at the right on the true toothbrush is depressed. However, this is a highly complex control procedure, which is not very suitable for children but can increase the game’s appeal for adults. Alternatively, the navigation switch 23 is a switch, which is to be operated as soon as certain positions/configurations are discernible on the display. Also alternatively, the navigation switch 23 is also designed as an ON/OFF switch of the electric toothbrush (for example, with a longer pressure time to turn the toothbrush on and off than for operation of the display functions). In another alternative, the ON/OFF switch of the electric toothbrush and the navigation switch 23 are designed separately, for example, on two opposing sides or other sides of the toothbrush handle.

[0053] In one embodiment, navigation control signals on the hand-held piece 3 may also be derived from operating parameters of the toothbrush 2. In particular, motion and/or acceleration signals corresponding to movements, in particular brushing movements by the toothbrush 2 may be generated by means of suitable detection devices, for example, in the form of motion sensors and/or acceleration sensors, so that the virtual display of the avatar 22 and/or the virtual brush part held by the avatar is navigated according to the actual movements of the toothbrush 2. The toothbrush 2 may also have an inclination sensor integrated into it, detecting the inclination and/or the orientation of the toothbrush 2 in space, so the avatar 22 not only moves back and forth but can also be tilted. The screen display of the avatar 22 may also be moved in synchronization with the movements and/or pressure switch operations on the toothbrush 2.

[0054] The dimensions and values disclosed herein are not to be understood as being strictly limited to the exact numerical values recited. Instead, unless otherwise specified, each such dimension is intended to mean both the recited value and a functionally equivalent range surrounding that value. For example, a dimension disclosed as “40 mm” is intended to mean “about 40 mm.”

[0055] Every document cited herein, including any cross referenced or related patent or application, is hereby incorporated herein by reference in its entirety unless expressly excluded or otherwise limited. The citation of any document is not an admission that it is prior art with respect to any invention disclosed or claimed herein or that it alone, or in any combination with any other reference or references, teaches, suggests or discloses any such invention. Further, to the extent that any meaning or definition of a term in this document conflicts with any meaning or definition of the same term in a document incorporated by reference, the meaning or definition assigned to that term in this document shall govern.

[0056] While particular embodiments of the present invention have been illustrated and described, it would be obvious to those skilled in the art that various other changes and modifications can be made without departing from the spirit and scope of the invention. It is therefore intended to cover in the appended claims all such changes and modifications that are within the scope of this invention.

1. A body care appliance comprising:
   - a toothbrush having a first display;
   - a base station for storing and/or charging the toothbrush;
   - and a second display for displaying interactive representations, which are interactively controllable by means of a control unit from the toothbrush;
   - wherein the second display forms a module that is designed separately from the base station and the toothbrush and is separately positionable; the second display having a communication interface for communication with the base station and/or with the toothbrush; and wherein the display includes a display element enclosed within a transparent convexly curved covering hood for increased visibility of the display element from various directions.

2. The body care appliance according to claim 1, wherein the second display has a rechargeable energy storage mechanism, wherein charging terminals that can be brought into
operative connection with one another are provided on the second display and on the base station.

3. The body care appliance according to claim 2, wherein both the second display and the toothbrush can be charged on the base station simultaneously.

4. The body care appliance according to claim 1, wherein the second display has an inductive charging terminal for inductive charging by the base station.

5. The body care appliance according to claim 1, wherein the toothbrush has a chargeable energy storage mechanism and an inductive charging terminal for inductive charging of the energy storage mechanism by the base station.

6. The body care appliance according to claim 1, wherein the second display has a game controller for controlling a videogame that can be displayed on the second display, such that game control commands that can be processed by the game controller can be sent to the game controller via the communication interface.

7. The body care appliance according to claim 1, wherein a game controller is provided on at least one of the base station and the toothbrush for controlling a videogame displayable on the second display, graphic control commands being transmittable from the toothbrush to the second display via the communication interface.

8. The body care appliance according to claim 1, wherein the base station includes restoring means for the second display and the toothbrush.

9. The body care appliance according to claim 8, wherein the restoring means are formed by magnetic holding means for holding the second display and the toothbrush on the base station.

10. The body care appliance according to claim 1, wherein the second display forms an electronic picture frame having a separate image data terminal for connection of an external image data source.

11. The body care appliance according to claim 1, wherein the first display provided on the toothbrush has a lightable display ring on a hand-held part.