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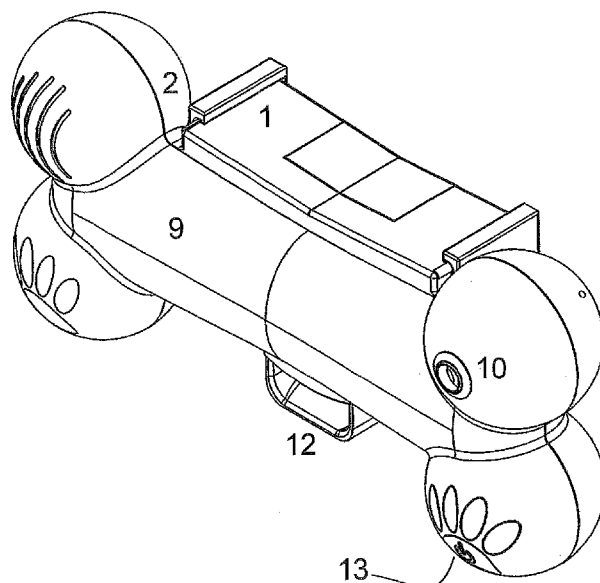


Fig. 1

(57) Abstract: A pet interaction device, comprising a communication interface configured for communication with a remote device, an audio-visual apparatus configured to present audio-visual information received from the remote device and/or capture and transmit audio-visual information to the remote device, a dispenser configured to store and dispense at least one treat and a sensor configured to sense an indication of the pet and, upon sensing the indication, to cause a communication session to be initiated with the remote device.

A PET INTERACTION DEVICE

Field of the Invention

The present invention relates to a pet interaction device. More particularly but not exclusively the invention relates to a pet interaction device for remote interaction.

Background

There are a number of times when a pet may be left unattended by their owner for example, when the owner goes to work or leaves the house for a number of hours. Although some owners may be able to take their pet to work or to certain places with them, this is often not possible therefore the dog may be left unattended for some periods of time.

Often the owner will arrange to be able to come back and visit the dog during the day or for someone else to visit for example to let them outside or take them for a walk. However for some pets, particularly young pets such as puppies, even after a few hours the pet may be anxious or destructive when left alone. Furthermore irregular sounds such as neighbors, deliveries or phones ringing may further distress the pet in the absence of the owner.

Some owners may leave a television or radio on as a distraction for their pets; however this may not settle the pet and may be costly to have on for long periods of time, and in particular does not provide two-way communication that replicates contact.

Prior Art

Accordingly a number of patent applications have been filed in an attempt to resolve the problem or similar, including the following:

United States patent application US 2011 139 076 (PU et al) discloses an intelligent pet-feeding device, comprising: a frame, configured with at least one output; at least one storage tank, for storing at least one kind of food while enabling each kind of food to be transported out of the frame from its corresponding output; a communication module, capable

of performing a wireless communication with a remote end; an imaging module, for capturing images and thus generating image signals accordingly; an audio transceiver module, for receiving and transmitting audio signals; and a central processing unit, electrically connected to the communication module, the imaging module and the audio transceiver module for processing signals received thereby and generated therefrom.

Granted European patent EP 1 876 885 (GROSS et al) discloses a dispenser device, in particular a reward dispenser device, comprising at least one dispenser for releasing a dispenser material for an animal, in particular for a dog, with the dispenser being equipped with at least one dispenser material receptacle and with a fixing device for carrying purposes, characterized in that the dispenser device has the dispenser and at least one signal transmitter, in that the dispenser has a release mechanism, which can be operated by remote control, for releasing the or a proportion of the dispenser material, in that the fixing device is designed as a fixing device for animals for the purpose of carrying the dispenser on the animal, and in that the signal transmitter, which is not to be carried by the animal, is designed for remote-controlled operation of the release mechanism.

Granted United States patent US 7 878 152 (KROLL) discloses a method of allowing communication from a pet owner to a pet including the steps of: a. Providing a speaker situated near a floor for the pet use, b. Providing a microphone near the owner, c. Initiating a telecommunications link from the microphone near the owner to the speaker near the floor for the pet use, d. Verifying that the link is from the pet owner, e. Amplifying the microphone signal from the owner delivered by the telecommunications link, f. Applying the amplifier signal to the speaker near the floor, and g. Thus allowing the owner to speak to the pet.

Summary of the Invention

The present invention is set out in the claims appended hereto. Referenced below in the description to the invention are to embodiments of the invention and should not be read as varying the scope of the invention as set out in the claims.

According to the present invention there is provided a pet interaction device comprising a dispenser, a video camera, audio capability, wireless connectivity and at least one sensor.

Said sensor may be disposed to sense movement of the pet. The wireless connectivity may

allow remote interaction. The apparatus may be part of a communication system. In preferred embodiments the device may be encompassed within and reliant upon standard telecommunications systems. The system may comprise a software or firmware application.

Preferably the pet interaction device enables two way communication thereby allowing an owner to stay in contact with their pet who is home alone, for example their dog, using their smartphone or cellphone or computer.

The interactive device is a fun way for the owner to communicate with their pet by calling the pet, activating audio and visual components and/or dispensing treats to gain the pet's attention and direct their orientation towards the device. The device replicates contact with the owner, who may subsequently give basic vocal training commands, watch the pet, give feedback to the pet, and/or dispense treats accordingly.

The device is not designed to replace human contact or encourage lengthier periods of absence from the pet as leaving pets for very lengthy periods of time can be undesirable and may lead to disruptive behaviour or anxiety, wherein the device is instead aimed for interaction, entertainment and training of the pet; and to check on the pet's welfare in the owner's absence.

The apparatus is embodied in preferred embodiments in a unitary device that is arranged in use in a pet's home, typically at a situation, arrangement and disposal synonymous with and reminiscent of a user or the pet's human owner and ideally with a means of attracting the pet's attention.

In this way typically there is provided an interactive pet communication system comprising: a device that is mountable on a surface which includes a casing that houses a treat dispenser wherein the device includes audio and visual means and is capable of transmitting and receiving data, including audio and visual information when triggered remotely by a controller or by activation of at least one sensor. This includes a capability for transmitting and receiving real-time audio and visual information when triggered remotely by a controller or by activation of at least one sensor.

In this way the user may communicate with their pet remotely for example when the user is at work and the pet is at home alone. Typically the user may activate the device remotely so as to stimulate the pet and check on the pet's wellbeing, interact, talk, train, entertain and dispense treats to

the pet. Furthermore the system may allow the user to establish the cause of behavioural problems or traits in their pet by being enabled to check the pet's status and behaviour when the user is not present.

In preferred embodiments the device may be adapted so as to be wall or ceiling mounted so to be able to dispense treats where the treats can be readily picked up and eaten by the pet, but so as to not be accessible to the pet, for example to prevent the dog being able to jump up to reach it but so as to enable the treat to be dispensed where it can be easily and naturally collected without disruption or deviation from standard routine, such as on the floor.

Typically the device is adapted to be mounted on a bracket so that it may be located on a surface such as the wall or ceiling wherein the device can be readily removed from the bracket for example so that it may be refilled with treats or relocated to a second bracket in a different room.

Ideally the bracket may be formed from a lightweight, durable material so as to be readily fitted to the surface. Preferably the bracket may be formed from a synthetic plastic that may be injection moulded to the desired dimensions to support and hold the device to aid in cleanliness and ease of formation and use. Advantageously the bracket is adapted to ensure the treat dispenser or any other functioning parts are not inhibited in use.

Preferably the bracket may be mounted on the wall at adult human eye level so that the pet is encouraged to look up to the device in the same way in which it would look up to the user. In particular, the device may be mounted at adult human eye level to encourage the pet to look up to the device in the same way in which it would look up to the user.

In some embodiments the device may be adapted to be free standing to allow for example placement on a shelf so as to remove the requirement for fitting of the bracket to the surface.

In preferred embodiments the casing encompasses all parts of the device and is formed from a lightweight, durable material such as synthetic plastic. In preferred embodiments the device may be dimensioned to represent a bone or fish so as to be readily distinguished as the pet communication device and attract the pet's attention.

Advantageously the device may have ends that provide suitable space to locate audio and/or visual components, whilst the centre may hold the treat dispenser.

The device may have any desired shapes and dimensions. The device may be predominantly square, rectangular round or in shape or have any other multi angled shape that may be readily accommodating of the components.

Preferably the casing houses the treat dispenser so that treats are held within a sealed compartment of casing until being dispensed. In this way they cannot be eaten by the pet prior to being dispensed and may be kept fresh within the device wherein a door reseals after dispensing, and wherein a mechanism mechanically enables the opening and closing of the dispenser so as to release treats from the casing typically through gravitational force.

In some embodiments to increase interaction the dispenser may dispense treats in different or randomised directions in order to replicate a naturalistic interaction.

Typically the mechanism includes a motor and/or resiliently deformable member or spring to enable the opening and closing of a channel through which treats are released and/or directed. For example the channel may move up and down or turn so as to capture the treat when raised and release the treat through the channel when lowered. In yet further embodiments a rotating door may dispense treats at points during rotation.

In some embodiments treats may be dispensed into the air with intention of the pet catching mid-air. In such embodiments the user may interact by monitoring such behaviour visually.

Preferably the device is provided with a mat or dish onto or into which the treats land when dropped so as to prevent them bouncing or skidding across the ground. Ideally the mat may be formed from a resiliently deformable material such as rubber or a cellular structure such as foam.

In preferred embodiments the casing houses audio and visual capability in the form of a microphone, speaker and/or a camera, wherein audio and visual information may be transmitted from the user to the pet and ideally from the pet to the user.

For example the camera may be used to transmit images of the pet or room the pet is in, to the user, and in addition or the alternative so as to enable the user to remotely check the pet's wellbeing.

Typically the user sends a signal to the device to activate the camera to take a picture or to record footage of the pet interact in real time. In further embodiments said signals are relayed automatically, for example by timed intervals or on trigger of a sensor. In further embodiments the pet may trigger interaction, for example wherein barking, may trigger recordal or transmittal of data from audio or visual capabilities. This enables communication to the user of real-time information relating to the pet and may enable real time interaction between the user and the pet.

In yet further embodiments a tactile form of pet interaction may be included, to include for example a button which the pet can press or toy which the pet can chew or squeeze. Said toy or button may be wireless connected to the device, and/or may be tethered, wired or fixed local to the device to enable efficient recordal or transmittal of images or audio.

Image data may then be transmitted to the controller for the user to view. Ideally the camera has a wide angle lens so as to be able to readily capture the pet's image. Furthermore the camera lens angle is arranged so as to be able to view a particular area for example being tilted towards the ground.

In some embodiments the lens or lenses may be moveable or mobile so as to be adjusted as required by the user. Yet further embodiments may comprise image recognition software and be enabled to automatically follow the pet. For example in yet further embodiments there may be provided a plurality of lenses in a plurality of locations.

In a similar manner the user may be able to select audio through the controller so as to engage the microphone and speaker to be able to hear the pet noises and so that the user can transmit audio communication to the pet, such as training instructions, reprimand or praise.

Additionally the audio data may be combined with the visual data so as to record video of the pet with sound.

In preferred embodiments the device includes at least one sensor which is triggered by audio and or

visual prompt, so that when the sensor is triggered a message is sent to the controller to alert the user to the sound. Alternatively when the sensor is triggered recording may be initiated and the data captured sent to the controller for user to observe.

The device in some embodiments may include a movement sensor so as to automatically capture image data when the sensor is activated and consequently relay details of the recorded movement to the user.

In some embodiments an activation button may be lit so as to provide a visual indicator of the status of the device wherein in particular the status is indicated to the pet, for example wherein lights may be provided or replica eyes, in order that the pet is alerted as to when the device is in use or when the user may be contactable.

In yet further embodiments a screen may be provided for the user to interact with the pet, wherein the pet may view the user on the screen if preferred.

In preferred embodiments the system may be used in conjunction with click or clicker training wherein a click sound is emitted as a reward for the dog or as an instruction. The click may be incorporated with the system to enable training techniques to be employed remotely.

In preferred embodiments the device includes a power source such as at least one battery so as to not require a wired power connection enabling the device to be readily moveable from one location to another. Although in some embodiments the device may be adapted to accept a mains power supply at least for recharging of the battery or batteries. In some embodiments, the device comprises a USB port to enable charging from a computer.

It may be envisaged that the device may be charged through a cable or docking station rather than removing and replacing batteries. For example the casing may include an opening to accept charging means such as the cable or docking station.

Typically the casing may include a plurality of compartments for housing the device components such as the dispenser and battery(s). Furthermore the device may also include compartments to house a printed circuit board (PCB) to connect the components and a receiver so receiver data and thereby operate the device.

Preferably the mechanism is controllable remotely by the controller wherein the controller is capable of sending data to the device, for example sending the signal in order to activate the dispensing mechanism.

In preferred embodiments the controller is capable of sending wireless signals to the receiver in the device so as to enable remote communication. Preferably the remote controller may operate through an internet connection or mobile network so as to enable transmission over greater distances. Additionally or alternatively the controller may operate wirelessly by radio frequency (RF), infra-red (IR) or intermachine operability such as Bluetooth (Trade Mark).

Preferably the system may be operated by a standard and independently sourced electronic device such as smartphone, tablet, computer or other microprocessor which serves as the controller wherein the controller is capable of sending and receiving wireless transmissions to and from the device. Furthermore these controllers have capability to enable visual and audio data to be played to the user.

In preferred embodiments the system may be operated through an interface such as a website or downloadable software application. For example the system may be provided with the application which can be installed on the smartphone, tablet or computer so as to operate the system remotely through the interface.

In some embodiments the system may include a timer so that the device may be programmed to release treats at predetermined times or intervals during the day or night, thereby keeping the pet entertained. In some further embodiments audio or visual components may be activated according to the timer, wherein the example the screen may be activated periodically to show an image of the user, or audio may be played accordingly to a randomised or periodic timer setting.

It may be envisaged in addition or the alternative that the timer can be controlled remotely so for example if the user is delayed in traffic or at work a programme may be run to release treats or otherwise activate components over the period the user is delayed.

Brief Description of Figures

Embodiments of the invention will now be described with reference to the accompanying figures, in which:

Figure 1 shows an isometric view of a preferred embodiment of the device for a canine;

Figure 2 shows side views of the embodiment shown in Figure 1;

Figure 3 shows top and bottom views of the embodiment shown in Figure 1;

Figure 4 shows end views of the embodiment shown in Figure 1;

And

Figure 5 shows an isometric exploded view of the embodiment shown in Figure 1; and

Figure 6 shows a schematic illustration of a pet interaction device and a remote device arranged for remote communication.

Detailed Description of Figures

With reference to the figures there is provided a unitary device mounted and mountable on a bracket 1, said device comprising two parts 2, 9.

A dispenser 12 dispenses treats as required, and a combined sensor with camera lens 11.

Internally the device further comprises a printed circuit board 6, rechargeable battery 3, dispenser gate 5, speaker 4 dispenser gate motor 7, and wireless receiver 8.

The invention has been described by way of examples only and it will be appreciated that variation may be made to the above-mentioned embodiments without departing from the scope of invention.

With respect to the above description then, it is to be realised that the optimum dimensional relationships for the parts of the invention, to include variations in size, materials, shape, form, function and manner of operation, assembly and use, are deemed readily apparent and obvious to one skilled in the art, and all equivalent relationships to those illustrated in the drawings and described in the specification are intended to be encompassed by the present invention.

Therefore, the foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly, all suitable modifications and equivalents may be resorted to, falling within the scope of the invention.

A detailed example of a pet interaction device, such as that illustrated by Figures 1 to 5, is now discussed with reference to Figure 6. It will be appreciated that the pet interaction device of Figure 6 may or may not comprise each of the components shown in the pet interaction device of Figures 1 to 5.

Figure 6 shows a pet interaction device 100 and a remote device 200.

The pet interaction device 100 comprises a communication interface 110 arranged for wireless communication with the remote device 200, a controller 120, a sensor 130, a dispenser 140, the dispenser 140 comprising a compartment 142, and audio-visual apparatus 150.

Each of the communication interface 110, the sensor 130, the dispenser 140 and the audio-visual apparatus 150 is coupled to receive signals from and send signals to the controller 120. In particular, the sensor 130 is arranged to provide sensor signals to the controller 120, the dispenser 12 is arranged to receive control signals from and send feedback to the controller 120, the audio-visual apparatus is configured to receive control signals and audio-visual data from and to provide audio-visual data to the controller 120, and the communication interface 110 is arranged for bidirectional communication of data, including audio-visual data, with the controller 120.

The sensor 130 comprises a motion sensor configured to sense a movement of the pet within a

threshold radius of the sensor 130 and, upon sensing the movement, to provide the controller 120 with a sensor signal indicating the presence of the pet in within the threshold radius.

The dispenser 140 comprises a compartment 142 which is arranged to receive a removable cartridge for storing treats, for example dog biscuits, for the pet. The compartment 142 has a door which is arranged to be aligned with an opening in a wall of the cartridge when the cartridge is received in the compartment 142. The door is configured to open to allow, in use, a treat to be dispensed from the opening in the cartridge upon receipt a command signal from the controller 120. The door may, for example, comprises electromagnets configured to hold the door shut until receipt of the controller signal, or it may comprise a rotating door arranged to be rotationally driven by a motor upon receipt of the controller signal. In another example, the compartment 142 comprises a rotatable hollow cylinder arranged to receive a cartridge, the compartment 142 having an opening which is alignable with a corresponding opening in a wall of the cartridge. The compartment 142 is configured to rotate to cause alignment of its opening with the opening of the cartridge to allow a treat to be dispensed therethrough upon receipt a command signal from the controller 120. The dispenser 140 may comprise a sensor to sense the quantity of treats in the compartment and to communicate the sensed quantity to the controller 120 at predetermined intervals or upon receipt of an update request from the controller 120. The sensor could, for example, be configured to measure the weight of treats within the compartment or the height of treats above a baseline of the compartment.

The cartridge may be removed when empty and replaced with a similar fresh cartridge, or the cartridge may be refilled. This compartment and cartridge arrangement allows treats to be easily restocked and helps to prevent debris from the treats from accruing in the dispenser 140.

The audio visual apparatus 150 comprise a microphone to capture audio output from the pet and a camera to capture a moving image of the pet. The microphone and camera may be provided by a standard video recorder to provide a stream of video data representing the pet, or they may be provided by discrete components. A camera may additionally or alternatively be provided for capturing static images of the pet.

The controller 120 is configured to receive data from, and to store data for controlling the operation of, the sensor 130, the dispenser 140, the audio-visual apparatus 140 and the communication interface 110. The controller 120 comprises programmable memory and may

comprise volatile and/or non-volatile memory. The controller 120 may comprise any suitable processor including a microprocessor and/or an application programmable interface or similar. In particular, the controller is configured to store instructions for causing the communication interface 110 to open a communication session with the remote device 200 upon receipt of a sensor signal indicating the presence of the pet within a threshold radius of the sensor. Instructions may also be stored for causing the dispenser 140 to dispense a treat at programmed intervals. Instructions may be stored for causing the audio-visual apparatus to capture audio-visual data for the pet at programmed intervals, to initiate a communication session with the pet interaction device 100 at programmed intervals, and/or to play, at intervals, a recorded message from the user which is stored in the memory.

The communication interface 110 comprises an appropriate telecommunications interface.

In an embodiment, the communication interface 110, controller 120, sensor 130, dispenser 140 and audio-visual apparatus 150 are arranged within a housing which, in one example, is of the form shown in Figures 1 to 5. In another example, the components are distributed.

The remote device 200 comprises a communication interface 210, application software 220, a controller 230 and a user interface 240. The communication interface 210 is arranged for wireless communication with the communication interface 110 of the pet interaction device 100, in particular to send and receive data, including audio-visual data, to and from the pet interaction device 100 and to provide received data to the controller 230. The controller 230 is coupled to exchange data with the user interface 240, which includes audio-visual hardware and software and a programmable interface of the remote device 200, and to exchange data with the application software 220.

The application software 220 comprises computer-readable instructions for running an application for interacting with the pet interaction device 200. In particular, instructions are stored for causing the user interface to capture audio-visual data for the user in response to initiation of a communication session by the remote device, to enable bidirectional audio-visual communication between the user and the pet. Instructions may be stored for initiating a communication session with the pet interaction device 100, via the communication interface 210, at programmed intervals or upon the input of a command from the user via the user interface 240.

The remote device may be a mobile phone, a laptop computer, a PC or any other telecommunications-enabled device with audio-visual capabilities.

In operation, movement of the pet within the threshold radius of the sensor 130 causes the sensor 130 to send a sensor signal to the controller 120. In response to receiving the sensor signal, the controller 120 sends a command to the audio-visual apparatus 150 to capture audio-visual information for the pet, and a command to the communication interface 110 to open a communication session with the remote device 200. The audio-visual data captured by the audio-visual apparatus 150 is then streamed to the remote device 200 and passed, via the controller 230 of the remote device 200, to the user interface 240 for receipt by the user. In response to the communication link being opened, the application software 220 of the remote device 200 causes the user interface 240 to capture audio-visual data for the user, which data is provided to the controller 230 for streaming to the pet interaction device 100. In this way a two-way real-time interaction is established between the user and the pet.

Additionally, the dispenser may dispense a treat to the pet at programmed intervals as instructed by the controller 120.

While in the above example the sensor 130 is described as comprising a motion sensor, the sensor 130 could additionally or alternatively comprise one or more of a heat sensor, a microphone and an image sensor, any or all of which could be configured to a sensor signal to the controller 120 upon sensing an indication of the pet within a threshold radius of the sensor. The sensor signal could be an on-off signal or could have an amplitude representing the magnitude of the sensed indication, and thereby representing the proximity of the pet to the sensor.

While in the above example, communication session is initiated with the remote device in response to the sensor sensing an indication of the pet, in another example, a communication session is only initiated upon verification of the identity of the pet. In such an example, the programmable memory of the controller 120 stores verification data for the pet, and the controller is configured, upon receipt of a sensor signal, to compare a characteristic of the sensor signal with a corresponding characteristic of the verification data and to cause initiation of a new communication session only when the characteristic of the sensor signal matches the characteristic of the verification data. The verification data could

comprises one or more of a visual profile for the pet, a sound profile for one or more pet-emitted sounds and a heat profile for the pet. This may allow interaction between the user and a particular one of several pets.

While in the above example, the dispenser is described as having a compartment 142 arranged to receive a removable cartridge, it will be appreciated that treats could be placed directly into the compartment, or a similar compartment, and dispensed directly therefrom. Such a compartment would be directly refillable with treats. The treats could comprise dog biscuits, another form of pet food or toys for the pet to play with.

In an embodiment, there is provided a pet interaction device, comprising:

- a communication interface configured for communication with a remote device;
- an audio-visual apparatus configured to present audio-visual information received from the remote device and/or capture and transmit audio-visual information to the remote device;
- a dispenser configured to store and dispense at least one treat; and
- a sensor configured to sense an indication of the pet and, upon sensing the indication, to cause a communication session to be initiated with the remote device.

In an embodiment, the sensed indication comprises at least one of movement, a heat indication and a sound indication and a visual indication of the pet.

In an embodiment, the sensor is configured to provide a sensor signal having an amplitude proportional to a magnitude of the sensed indication.

In an embodiment, the sensor is configured to provide a sensor signal only upon sensing an indication having a magnitude above a threshold value.

In an embodiment, the sensor comprises a heat sensor configured to provide a sensor signal only upon sensing to a heat above a threshold energy.

In an embodiment, the sensor comprises a microphone configured to provide a sensor signal only upon sensing a sound above a threshold volume.

In an embodiment, the sensor is configured to provide a sensor signal to the controller upon sensing an indication of the pet and the controller is configured to cause, in response to receiving the sensor signal, the communication session to be initiated with the remote device.

In an embodiment, the controller is configured to cause the communication session to be initiated with the remote device upon receipt of a sensor signal having an amplitude above a threshold amplitude stored in the programmable memory only.

In an embodiment, the controller is further configured to cause a communication session to be initiated with the remote device at intervals defined by a regime stored in the memory.

In an embodiment, the controller is further configured to cause a communication session to be initiated with the remote device upon receipt of a request for communication from the remote device.

In an embodiment, the programmable memory is configured to receive and store a recorded message. The recorded message may comprise audio data and/or image data. The controller may be configured to cause the message to be played in response to a command from the remote device. The controller may be configured to cause the audio-visual apparatus to play the recorded message at intervals defined by a regime stored in the programmable memory. The controller is configured to update the regime in response to an update command from the remote device.

In an embodiment, the pet interaction device comprises a pet interaction element configured such that tactile interaction of the pet with the pet interaction element causes a communication session to be initiated. The pet interaction element may be configured such that tactile interaction of the pet with the pet interaction element causes the message to be played.

In an embodiment, the dispenser is configured to dispense a treat at intervals defined by a regime stored in the programmable memory.

In an embodiment, the controller is configured to update the regime in response to an update command from the remote device.

In an embodiment, the dispenser is configured to dispense a treat in response to a command from the remote device.

In an embodiment, the sensor comprises an image sensor, wherein the controller is configured to compare sensed image data received from the image sensor with model image data representing the pet and, in response to finding a positive match, to do at least one of:

- enable communication with the remote device; and
- dispense a treat.

In an embodiment, the sensor comprises an image sensor, wherein the controller is configured to compare sensed image data received from the image sensor with model image data representing the pet and, in response to finding a positive match, to play the recorded message.

In an embodiment, the pet interaction device is configured to be powered by at least one of a battery, a USB port, a docking station or a mains connection.

In an embodiment, the pet interaction device is configured to communicate wirelessly with the remote device via radio frequency (RF) or infra-red (IR) technology or intermachine operability such as Bluetooth™.

In an embodiment, the pet interaction device is configured to communicate with an application on the remote device.

In an embodiment, the device is mountable on a wall. Being mountable on a wall may comprise being configured to securely couple to a wall-mountable bracket.

In an embodiment, there is provided a pet interaction kit comprising the pet interaction device of claim 36 and the wall-mountable bracket. The kit may comprise a collector to catch treats dispensed from the dispenser.

In an embodiment, the pet interaction device comprises a dispenser, a video camera, audio capability, wireless connectivity and at least one sensor.

In an embodiment, the pet interaction device comprising a unitary device adapted for mounting in a plurality of locations.

In an embodiment, the pet interaction device comprises audio and visual means and capable of transmitting and receiving data, including audio and visual information, when triggered remotely by a controller or by activation of at least one sensor.

In an embodiment, the pet interaction device comprises a tactile form of pet interaction. The tactile form may be provided as a button for operation by the pet.

In an embodiment, the pet interaction device comprises a pet visual attraction aid.

In an embodiment, the pet interaction device comprises the wireless connectivity to enable use of a software application on a mobile computing device.

Claims

1. A pet interaction device, comprising:
a communication interface configured for communication with a remote device;
an audio-visual apparatus configured to present audio-visual information received from the remote device and/or capture and transmit audio-visual information to the remote device;
a dispenser configured to store and dispense at least one treat; and
a sensor configured to sense an indication of the pet and, upon sensing the indication, to cause a communication session to be initiated with the remote device.
2. The pet interaction device of claim 1, wherein the sensed indication comprises at least one of movement, a heat indication and a sound indication and a visual indication of the pet.
3. The pet interaction device of claim 1 or 2, wherein the sensor comprises a motion sensor.
4. The pet interaction device of any of the preceding claims, wherein the sensor comprises a heat sensor.
5. The pet interaction device of any of the preceding claims, wherein the sensor comprises a microphone.
6. The pet interaction device of any of the preceding claims, wherein the sensor is configured to provide a sensor signal having an amplitude proportional to a magnitude of the sensed indication.
7. The pet interaction device of any of claims 1 to 5, wherein the sensor is configured to provide a sensor signal only upon sensing an indication having a magnitude above a threshold value.
8. The pet interaction device of claim 3, wherein the motion sensor is configured to provide a sensor signal only upon sensing a movement within a threshold radius.

9. The pet interaction device of claim 4, wherein the heat sensor is configured to provide a sensor signal only upon sensing to a heat above a threshold energy.
10. The pet interaction device of claim 5, wherein the microphone is configured to provide a sensor signal only upon sensing a sound above a threshold volume.
11. The pet interaction device of any of the preceding claims, comprising a controller having a processor and programmable memory.
12. The pet interaction device of claim 11, wherein the sensor is configured to provide a sensor signal to the controller upon sensing an indication of the pet and the controller is configured to cause, in response to receiving the sensor signal, the communication session to be initiated with the remote device.
13. The pet interaction device of claim 11 or 12, wherein the controller is configured to cause the communication session to be initiated with the remote device upon receipt of a sensor signal having an amplitude above a threshold amplitude stored in the programmable memory only.
14. The pet interaction device of any of claims 11 to 13, wherein the programmable memory stores verification data for the pet, and wherein the controller is configured, upon receipt of a sensor signal, to:
- compare a characteristic of the sensor signal with a corresponding characteristic of the verification data; and
 - to allow initiation of a new communication session only when the characteristic of the sensor signal matches the characteristic of the verification data.
15. The pet interaction device of claim 14, wherein the verification data comprises at least one of:
- a visual profile for the pet;
 - a sound profile for one or more pet-emitted sounds;
 - a heat profile for the pet.
16. The pet interaction device of any of claims 11 to 15, wherein the controller is further

configured to cause a communication session to be initiated with the remote device at intervals defined by a regime stored in the memory.

17. The pet interaction device of any of claims 11 to 16, wherein the controller is further configured to cause a communication session to be initiated with the remote device upon receipt of a request for communication from the remote device.

18. The pet interaction device of any of claims 11 to 17, wherein the programmable memory is configured to receive and store a recorded message.

19. The pet interaction device of claim 18, wherein the message comprises audio data.

20. The pet interaction device of claim 18 or 19, wherein the message comprises image data.

21. The pet interaction device of any of claims 18 to 20, wherein the controller is configured to cause the message to be played in response to a command from the remote device.

22. The pet interaction device of any of claims 18 to 21, wherein the controller is configured to cause the audio-visual apparatus to play the recorded message at intervals defined by a regime stored in the programmable memory.

23. The pet interaction device of claim 22, wherein the controller is configured to update the regime in response to an update command from the remote device.

24. The pet interaction device of any of claims 11 to 23, comprising a pet interaction element configured such that tactile interaction of the pet with the pet interaction element causes a communication session to be initiated.

25. The pet interaction device of any of claims 18 to 23, comprising a pet interaction element configured such that tactile interaction of the pet with the pet interaction element causes the message to be played.

26. The pet interaction device of any of claims 11 to 25, wherein the dispenser is configured to dispense a treat at intervals defined by a regime stored in the programmable memory.
27. The pet interaction device of claim 26, wherein the controller is configured to update the regime in response to an update command from the remote device.
28. The pet interaction device of any of the preceding claims, wherein the dispenser is configured to dispense a treat in response to a command from the remote device.
29. The pet interaction device of any of the preceding claims, wherein the sensor comprises an image sensor.
30. The pet interaction device of claim 29, wherein the controller is configured to compare sensed image data received from the image sensor with model image data representing the pet and, in response to finding a positive match, to do at least one of:
enable communication with the remote device; and
dispense a treat.
31. The pet interaction device of any of claims 18 to 23, wherein the sensor comprises an image sensor, wherein the controller is configured to compare sensed image data received from the image sensor with model image data representing the pet and, in response to finding a positive match, to play the recorded message.
32. The pet interaction device of any preceding claim, wherein the pet interaction device is configured to be powered by at least one of a battery, a USB port, a docking station or a mains connection.
33. The pet interaction device of any preceding claim, wherein the pet interaction device is configured to communicate wirelessly with the remote device via radio frequency (RF) or infra-red (IR) technology or intermachine operability such as Bluetooth™.
34. The pet interaction device of any preceding claim, wherein the pet interaction device is configured to communicate with an application on the remote device.

35. The pet interaction device of any preceding claim, wherein the device is mountable on a wall.
36. The pet interaction device of claim 35, wherein being mountable on a wall comprises being configured to securely couple to a wall-mountable bracket.
37. A pet interaction kit comprising the pet interaction device of claim 36 and the wall-mountable bracket.
38. A pet interaction kit comprising the pet interaction device of any of claims 1 to 36 and a collector to catch treats dispensed from the dispenser.
39. A pet interaction system comprising:
the pet interaction device of any of claims 1 to 36 or the kit of claim 37 or 38; and
the remote device.
40. A pet interaction device, comprising:
means for communicating with a remote device;
means for presenting audio-visual information received from the remote device and/or for capturing and transmitting audio-visual information to the remote device;
means for storing and dispensing a treat; and
means for sensing an indication of the pet and, upon sensing the indication, causing a communication session to be initiated with the remote device.
41. A pet interaction device comprising a dispenser, a video camera, audio capability, wireless connectivity and at least one sensor.
42. A pet interaction device comprising a unitary device adapted for mounting in a plurality of locations.
43. A device according to claim 41 or 42 further comprising audio and visual means and capable of transmitting and receiving data, including audio and visual information, when triggered remotely by a controller or by activation of at least one sensor.

44. A device according to claim 41, 42 or 43 further comprising a tactile form of pet interaction.
45. A device as claimed in claim 44, in which said tactile form is as a button for operation by the pet.
46. A device according to any of claims 41 to 45 further comprising a pet visual attraction aid.
47. A device according to any of the claims 41 to 46 wherein the wireless connectivity enables use of a software application on a mobile computing device.

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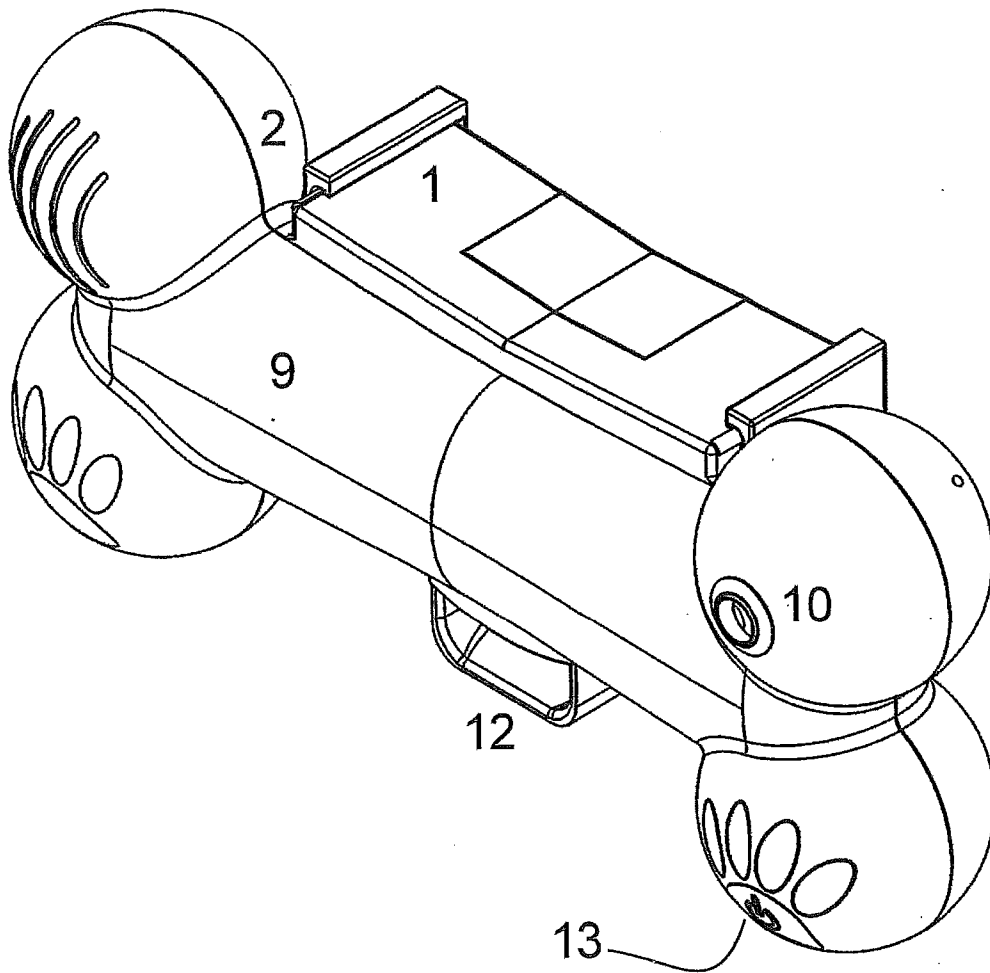


Fig. 1

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fig. 2 a

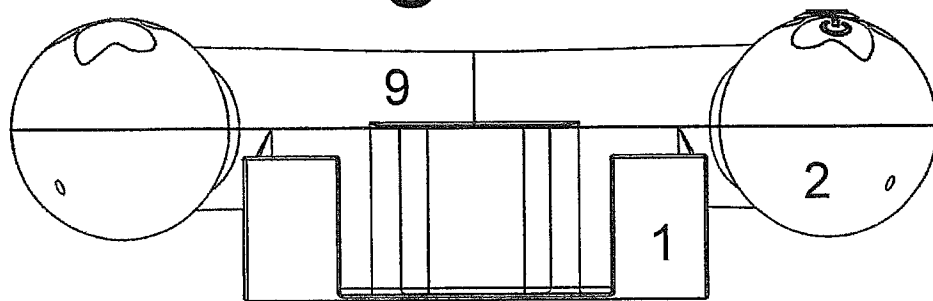
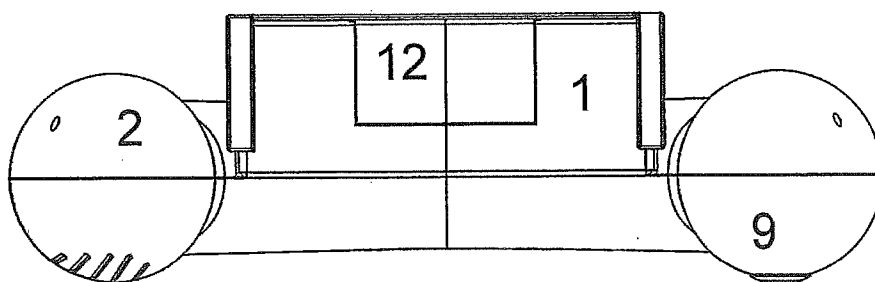


fig. 2 b



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fig. 3a

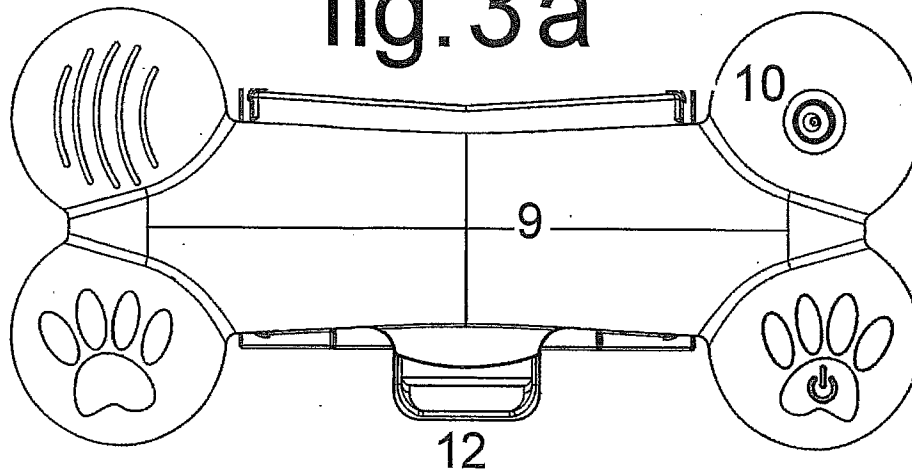
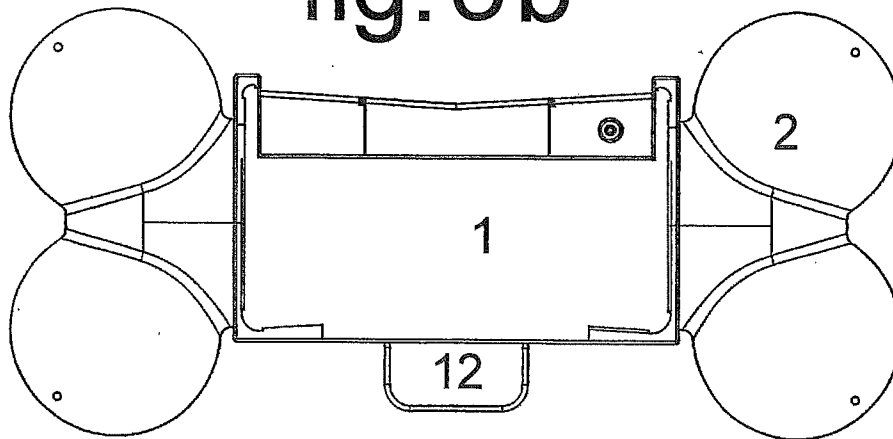


fig. 3b



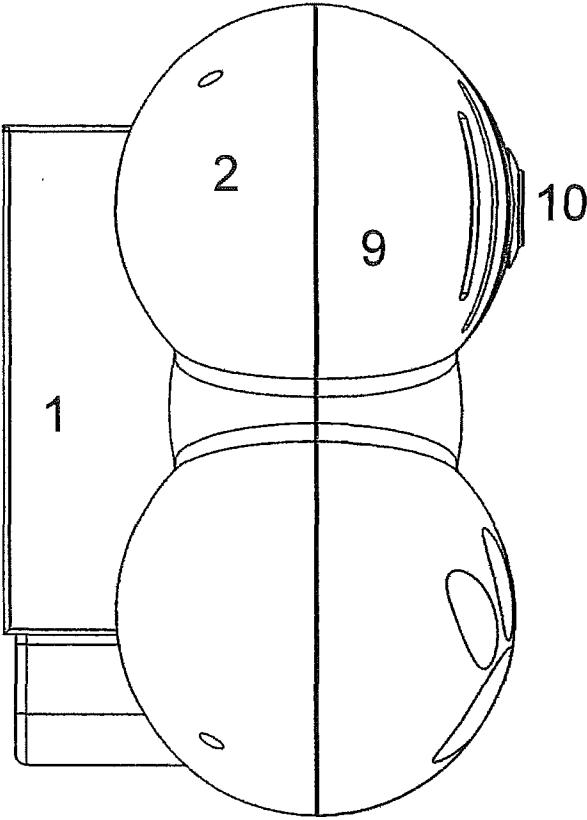


fig. 4a

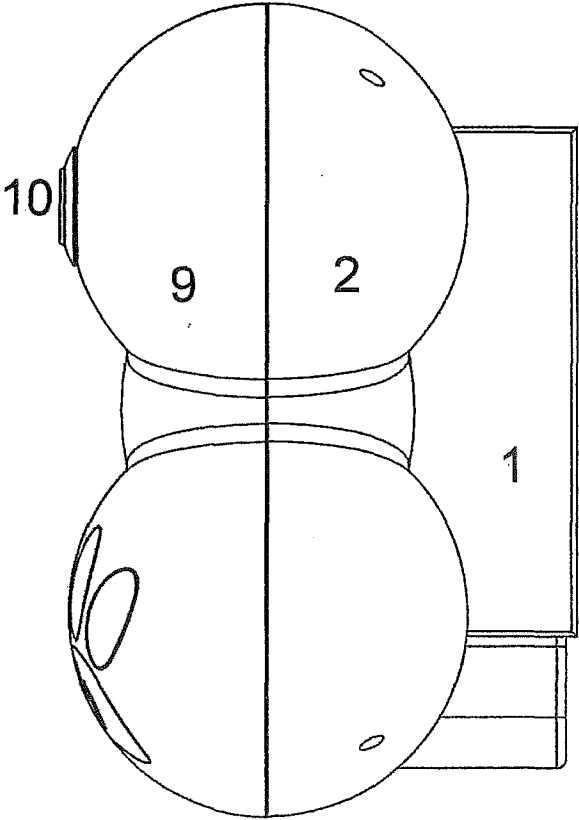


fig. 4b

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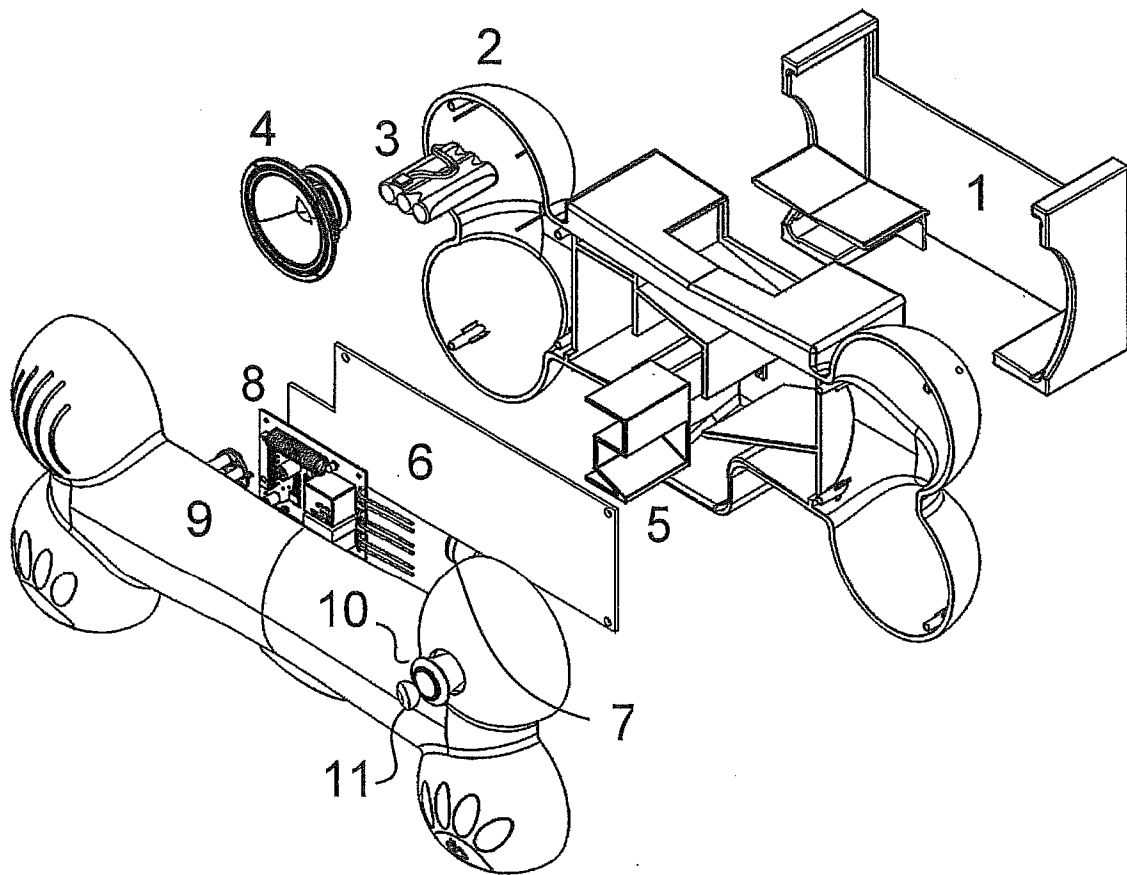


Fig. 5

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Fig. 6

