(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
11 July 2019 (11.07.2019)

WIPO | PCT

(10) International Publication Number
WO 2019/135782 A1

(51) International Patent Classification:
A63H 3/28 (2006.01) *A63H 13/00* (2006.01)
A63H 3/50 (2006.01) *A63H 29/22* (2006.01)
A63H 3/48 (2006.01) *A63H 31/08* (2006.01)
A63H 11/00 (2006.01)

(21) International Application Number:
PCT/US2018/023040

(22) International Filing Date:
17 March 2018 (17.03.2018)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
15/863,859 05 January 2018 (05.01.2018) US

(71) Applicant: **AMERICAN FAMILY LIFE ASSURANCE COMPANY OF COLUMBUS** [US/US]; 1932 Wynnton Road, Columbus, GA 31999 (US).

(72) Inventors: **MADDOCKS, Richard, Joseph**; 7 Copper Kettle Lane (US). **ASKELAND, Leif**; 39 Sophia Lane, Greenville, RI 02828 (US). **RODRIGUEZ, Eduardo, Javier**; 53 Lawton Ave., Tiverton, RI 02878 (US). **SMITH, Shelley, Marie**; 37 Liberty Street, Plymouth, MA 02360 (US).

(74) Agent: **LEHRER, Richard, M.** et al.; Fisherbroyles, LLP, 1 Prior Court, Palisades, NY 10964 (US).

(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JO, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK,

(54) Title: ANIMATRONIC TOY

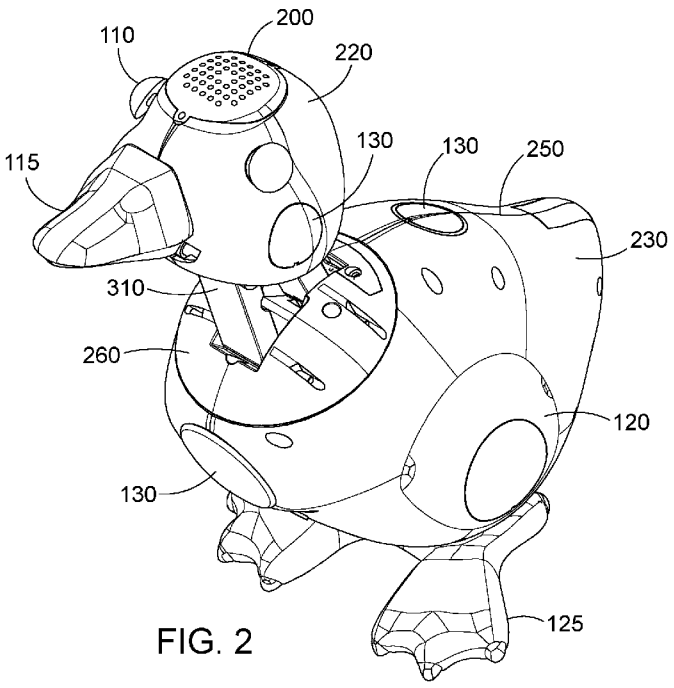

FIG. 2

(57) Abstract: An animatronic doll is disclosed. The doll, includes multiple motors, one or more of which controls conjoined movements of various parts of the doll and one or more of which controls individual parts of the doll. The doll may include a speaker for causing the duck to vibrate and/or it may include various sensors for user and environmental interaction.

WO 2019/135782 A1

[Continued on next page]

EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

— *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*

Published:

— *with international search report (Art. 21(3))*

ANIMATRONIC TOY

Field of the Technology

[0001] The technology of this application relates generally to a child's toy and more specifically but not exclusively to an animatronic duck shaped toy.

Background of the Technology

[0002] An animatronic toy is typically a plastic figure in the shape of an animal, person or fictional character, which has internal gears and controllers that move parts of the toy to mimic organic movements. Animatronic toys have existed since at least the mid-1980s with the introduction of toys such as Teddy Ruxpin™, a bear whose mouth and eyes moved while he read stories that were played from an audio tape cassette deck built into its back, and others.

[0003] Animatronic toys have a potential use not only for play, but also in a healthcare setting. It is well known that pet therapy can provide comfort and emotional support to people of all ages. The movement and interaction of an animatronic toy simulating an animal, can provide a similar form of therapy to those who do not otherwise have access to pet therapy.

[0004] Conventional toys of this nature find it difficult to mimic lifelike movements in a believable way.

[0005] It may be advantageous to create an animatronic toy with substantially lifelike movements.

Brief Summary of the Technology

[0006] Many advantages will be determined and are attained by one or more embodiments of the technology, which in a broad sense provides an animatronic toy with naturalistic lifelike movement to simulate an animal such as duck. The duck may execute various choreographed movements to enable both calming and joyful interactions with a user. For example, the duck may tilt its head forward and open its mouth, or the duck may tilt its head left or right or the duck may turn its head right or left while leaning its body in the opposite direction.

[0007] In one or more embodiments a doll that performs automated movements is provided. The doll may include an outer shell that forms a shape of the doll. The outer shell may be separated into a head section and a body section, such that the head and body sections are connected through at least one internal connection. Further, at least one of the head and the body may be movable relative to the other; The doll further includes movable body parts, and at least one body part is located at least partially within the body section and at least one body part is located at least partially within the head section. At least two motors are disposed within the outer shell. At least one of the of motors is mounted so that it can simultaneously drive various ones of the automated movements of the doll and at least one of the motors may be mounted to drive a single movement of the doll. A set of gears associated may be with each of the motors. The gears act to step down an output speed of the motor. The doll includes a cam mechanism associated with each of the motors and a follower associated with at least one of the cam mechanisms. A cam mechanisms included a groove. The groove acts as a guide path for the associated follower. The doll also includes at least one controller associated with at least one of the motors, wherein the controller provides the automated movements of the body parts by starting and stopping the motor.

[0008] In one or more embodiments an animatronic duck is provided which includes automated moving parts. The duck may include a base section which includes feet and at least one leg. The base section may house a body support element, which has a top and a shaft support. An axle/shaft may be supported in the shaft support and a cam follower may be supported by the axle. The cam follower rotates about an axis of the axle. The duck also includes an outer shell that forms a shape of the duck. The outer shell may be separated into a head section and a body section. The head and body sections are connected through at least one internal connection. A motor may be connected to the cam follower. A set of gears may be meshed to the motor. A horizontal cam mechanism may be associated with the set of gears. The cam mechanism may have a groove, which acts as a guide path for the follower. The duck includes a head turning gear horizontally meshed with the set of gears and a neck assembly joined with the head turning gear. The internal connection

may be connected to the neck assembly such that when the motor operates the head section turns relative to the body section and the body section tilts relative to the base.

[0009] The technology will next be described in connection with certain illustrated embodiments and practices. However, it will be clear to those skilled in the art that various modifications, additions and subtractions can be made without departing from the spirit or scope of the claims.

Brief Description of the Drawings

[0010] For a better understanding of the technology, reference is made to the following description, taken in conjunction with any accompanying drawings in which:

[0011] FIG. 1 illustrates a front view of an exemplary animatronic doll including an attached removable skin in accordance with one or more embodiments of the disclosed technology;

[0012] FIG. 2 illustrates a perspective view of the exemplary doll of FIG. 1 without the skin in accordance with one or more embodiments of the disclosed technology;

[0013] FIG. 3 illustrates a bottom view of the exemplary doll of FIG. 1 without the skin in accordance with one or more embodiments of the disclosed technology;

[0014] FIG. 4 illustrates a left-side view of the exemplary doll of FIG. 1 without the skin in accordance with one or more embodiments of the disclosed technology;

[0015] FIG. 5 illustrates a right-side view of the exemplary doll of FIG. 1 without the skin in accordance with one or more embodiments of the disclosed technology;

[0016] FIG. 6 illustrates a rear view of the exemplary doll of FIG. 1 without the skin in accordance with one or more embodiments of the disclosed technology;

[0017] FIG. 7 illustrates a left-side view of the exemplary doll of FIG. 1 without the skin and with the side panel of the head removed in accordance with one or more embodiments of the disclosed technology;

[0018] FIG. 8 illustrates a left-side view of the exemplary doll of FIG. 1 without the skin, with the wing and side panel of the body removed and with a cover for the neck assembly removed in accordance with one or more embodiments of the disclosed technology; and

[0019] FIG. 9 illustrates a right-side view of an upper portion of the exemplary doll of FIG. 1 without the skin, with the side panel of the body and the side panel of the

head removed and with a cover for the neck assembly removed in accordance with one or more embodiments of the disclosed technology.

[0020] The technology will next be described in connection with certain illustrated embodiments and practices. However, it will be clear to those skilled in the art that various modifications, additions, and subtractions can be made without departing from the spirit or scope of the claims.

Detailed Description of the Technology

[0021] One or more embodiments of the technology provides, in a broad sense, an animatronic doll. A doll such as an animatronic duck is provided which may include, among other things, a speaker, various input devices, a movable beak, a tongue within the moveable beak, wings and feet. The duck may perform various conjoined or individual movements such as a tilting of the head forward while opening the beak, turning the head to the right or left while the body tilts in the opposite direction, or tilting the head right or left. The duck may also provide sounds in conjunction with the movements or separate from the movements.

[0022] Discussion of an embodiment, one or more embodiments, an aspect, one or more aspects, a feature, one or more features, a configuration or one or more configurations, an instance or one or more instances is intended be inclusive of both the singular and the plural depending upon which provides the broadest scope without running afoul of the existing art and any such statement is in no way intended to be limiting in nature. Technology described in relation to one or more of these terms is not necessarily limited only to use in that embodiment, aspect, feature, configuration or instance and may be employed with other embodiments, aspects, features, configurations and/or instances where appropriate.

[0023] For purposes of this disclosure "doll" means an animatronic scaled figure which has the shape of a person, animal or creature. The doll may be completely animatronic, or a combination of animatronic and manually movable parts. While the disclosure may refer to a duck shaped doll or simply a duck, the technology is not so limited. This reference is made for ease of explanation only and is not intended to be limiting as far as the shape or size of the doll. Disclosure related to the duck may be applied or related equally to other dolls that have a similar shape.

[0024] For purposes of this disclosure "sensor" means one or more photodetectors, capacitive sensors, radio frequency (rf) sensors, cameras, microphones, Bluetooth Low Energy (BLE) detectors, WiFi detectors, ProSe detectors, LTE-D detectors or accelerometers.

[0025] Figures 1-8 illustrate various aspects of an animatronic duck 100. Figure 1 illustrates duck 100 fully assembled with a plush outer skin that simulates an actual duck. As illustrated, duck 100 may include two eyes 110, a beak 115, wings 120 and feet 125. Duck 100 may also include one or more sensors 130. One or more sensors may be employed to activate various movements and/or sounds. In addition, the duck 100 may include various direct current (DC) motors, shafts, gears, cams and cam followers which combine in various combinations to enact various movements of duck 100.

[0026] Figs. 2-6 illustrate an embodiment of the doll 100 with the skin removed. Fig. 2 illustrates that the duck may include a speaker 200 for broadcasting sounds that the duck 100 is configured to produce. Speaker 200 may be a standard speaker or it may be a vibrational speaker. Speaker 200 may be electrically connected to a conventional storage device with prerecorded sounds and/or it may be electrically connected to a recording device and microphone which allows the user to make recordings for playback through the speaker 200. The speaker may be activated by one or more of the sensors 130.

[0027] Figs. 2-6 further illustrate that the head and body may include housings 220 and 230. As illustrated both the housing for the head 220 and the housing for the body 230 may exhibit bilateral symmetry across a center of the duck 250, where the respective sides of the housings are snapped together to form the exterior of the duck 100. This provides shape to the duck 100 and protects the inner workings thereof. Each side of housings 220 and 230 may be formed from a single piece of molded plastic or from smaller pieces that are snapped together in a conventional manner. The body housing 230, when assembled, may provide a relatively circular opening near the top for the neck of the duck 100. The opening may be covered by a dome shaped neck cover 260, which itself may provide openings for the neck linkages 310 and 315 to pass therethrough. Neck cover 260 may be rotatably connected to the duck 100 (as will be discussed further below) to enable the head to rotate/turn from side to

side. As illustrated in Figure 6, the body housing may also include an opening for a battery compartment. The battery compartment may include a battery cover 600 which may be selectively removed to enable battery replacement without the need to remove the rest of the body housing 230.

[0028] Figures 3 and 6 illustrate that feet 125 may be connected to a single leg 320 that extends into the duck 100. This leg 320 and feet 125 combination acts as a base for the duck 100 around which the duck 100 may lean.

[0029] As discussed above, one of the movements that duck 100 may perform includes tilting the body to one side or the other relative to the center 250. This motion, which will be explained with reference to Figure 8, may be accomplished with motor 820, which is electrically connected to the batteries via a processor or via other circuit logic. Motor 820 is meshed with a set of gears 825, which are configured to step down the speed of the motor to provide smooth lifelike movement. The gears 825 may also be configured to change the direction of the energy provided by motor 825 (e.g. from a vertical plane of movement into a horizontal plane of movement). Gears 825 may be connected to or in contact with cam 830 such that when gears 825 rotate they rotate cam 830. Cam 830 includes a groove 835 around its circumference, in which follower 800 is located. As illustrated, the groove may traverse the circumference of the cam so that the groove on one side of the cam is higher than on the other side of the cam. Thus, as the cam rotates, the follower 800 will lean to one side or the other depending upon whether it is in the higher side of the groove or the lower side of the groove. In turn, this leans the body of the duck 100 to one side or the other. Because the groove traverses the entirety of the cam, the motor 820 can be a single direction motor, although it need not be. As the cam follower 800 moves through the path of the groove 835 it will alternate between tilting towards the left and tilting towards the right without having to reverse the motor 835 to do so. Cam follower 800, which may include a protrusion which interacts with groove 835 also includes a long portion that extends downwards towards the leg 320.

[0030] Leg 320 may include a hollow middle which houses body support 805. The top of body support 805 may include a shaft support for shaft 810. Shaft 810 may be configured to rotate or it may be configured to be locked in place. Shaft 810 may also be placed through a hole in cam follower 800 to support cam follower 800. If shaft

810 is configured to rotate then cam follower 800 may be secured to shaft 800 or shaft 800 may be part of can follower 800. If shaft 810 does not rotate then cam follower 800 may rest on shaft 800 such that can follower 800 may rotate about shaft 810. Biasing spring 815 may also be connected to shaft 810 or it may be connected to body support 805. Either way, biasing spring 815 is configured to contact cam follower 800 to ensure a controlled smooth movement when cam follower 800 moves.

[0031] As indicated above, various movements may be conjoined. Two such movements may include tilting of the body with turning the head. To that end, motor 820 may also be employed to rotate the head.to the left or to the right. A head turning gear 840 is also meshed with the set of gears 825 and thus as gears 825 rotate they rotate head turning gear 840, which in turn rotates the neck assembly 845. Neck assembly 845 is connected to neck housing 850, which is connected to neck cover 260. Neck cover 260 is connected to neck linkages 310/315, which connect the head to the body. Thus, as the head turning gear 840 rotates, it rotates the head.

[0032] In one or more embodiments, duck 100 may tilt its head forward. Figures 7-9 illustrate that tilting motor 900 in combination with a set of tilt gears 910, neck cam 865, neck follower 860, neck linkages 310 and 315, neck housing 260 and neck subassembly 915 may be employed for this task. Head tilting motor 900 may be electrically connected to the batteries via a processor or via other circuit logic. Motor 900 is meshed with a set of gears 910, which are configured to step down the speed of the motor 900 to provide smooth lifelike movement. The gears 910 may also be configured to change the direction of the energy provided by motor 900 (e.g. from a vertical plane of movement into a horizontal plane of movement). Gears 910 may be connected to or in contact with neck cam 865 such that when gears 910 rotate they rotate cam 865. Cam 865 may be substantially disc shaped and connected to follower 860 in a planar surface proximal the circumference of the cam 865 such that the planar surfaces of cam 865 and follower 860 are substantially parallel. Follower 860 may be a substantially flat, longitudinal element which connects to cam 865 in a planar surface of follower 860 at a location which is off-center in the longitudinal direction. This configuration causes follower 860 to move in a relatively up and down direction rather than solely in a circular motion as cam 865 rotates about its axis. As neck follower 860 moves up it pushes on the bottom of rear neck linkage

315, which then pushes up on the rear of the neck assembly 915 while the front neck linkage 310 which is attached to the front of the neck assembly 915 remains relatively motionless (or at least it has less range of motion than front neck linkage) which causes the front of the head to tilt in a downwards direction. A pair of beak linkage assemblies 920 connect the lower beak 405, which may be hingedly connected to the head, to the upper edge of the rear neck linkage 315 such that as the rear linkage 315 moves in an upward direction it puts downward pressure on lower beak 405 thus making it appear as if the duck 100 is opening its beak. Beak linkage assemblies 920 may connect to the lower beak 405 at a point below and forward of the hinge 980 that connects the lower beak 405 to the head.

[0033] One or more embodiments provides the ability for the duck 100 to tilt its head to the left or right. In such an embodiment, a side head tilt motor 940 may be secured on top of neck assembly 915. Side head tilt motor 940 may be electrically connected to the batteries via a processor or via other circuit logic. Side head tilt motor 940 is meshed with a set of gears, which are configured to step down the speed of the side head tilt motor to provide smooth lifelike movement. The gears may be connected to or be in contact with head cam 930, which in turn may be connected to the housing for the head 220 such that when the gears rotate they rotate head cam which in turn tilts the head to one side or the other.

[0034] In any or all of the above embodiments, a cam (e.g. cam 865 in Fig. 8) may include wipers 870 for contact with a printed circuit board (similar to rotary phone technology), to generate various codes for operating various movements of duck 100, and/or to activate vibrational speaker 200 and/or to generate sounds though speaker 200. Additionally, any or all of the above configurations may include a spring linkage to allow for manual movement of the various elements without causing them to break.

[0035] Having thus described preferred embodiments of the technology, advantages can be appreciated. Variations from the described embodiments exist without departing from a scope of one or more claims. It is seen that an animatronic doll provided. Although specific embodiments have been disclosed herein in detail, this has been done for purposes of illustration only, and is not intended to be limiting with respect to the scope of the claims, which follow. It is contemplated by the inventors that various substitutions, alterations, and modifications may be made without

departing from the spirit and scope of the technology as defined by the claims. For example, different and/or additional individual or conjoined movements may be included. The combination of conjoined movements may be modified, etc. Other aspects, advantages, and modifications are considered within the scope of the following claims. The claims presented are representative of the technology disclosed herein. Other, unclaimed technology is also contemplated. The inventors reserve the right to pursue such technology in later claims.

[0036] Insofar as embodiments described above are implemented, at least in part, using a computer system, it will be appreciated that a computer program for implementing at least part of the described methods and/or the described systems is envisaged as an aspect of the technology. The computer system may be any suitable apparatus, system or device, electronic, optical, or a combination thereof. For example, the computer system may be a programmable data processing apparatus, a computer, a Digital Signal Processor, an optical computer or a microprocessor. The computer program may be embodied as source code and undergo compilation for implementation on a computer, or may be embodied as object code, for example.

[0037] It is also conceivable that some or all of the functionality ascribed to the computer program or computer system aforementioned may be implemented in hardware, for example by one or more application specific integrated circuits and/or optical elements. Suitably, the computer program can be stored on a carrier medium in computer usable form, which is also envisaged as an aspect of the invention. For example, the carrier medium may be solid-state memory, optical or magneto-optical memory such as a readable and/or writable disk for example a compact disk (CD) or a digital versatile disk (DVD), or magnetic memory such as disk or tape, and the computer system can utilize the program to configure it for operation. The computer program may also be supplied from a remote source embodied in a carrier medium such as an electronic signal, including a radio frequency carrier wave or an optical carrier wave.

[0038] It is accordingly intended that all matter contained in the above description or shown in the accompanying drawings be interpreted as illustrative rather than in a limiting sense. It is also to be understood that the following claims are intended to cover the generic and specific features of the technology as described herein, and all

statements of the scope of the technology which, as a matter of language, might be said to fall there between.

[0039] Having described the technology, what is claimed as new and secured by Letters Patent is:

Claims:

1. A doll that performs automated movements, the doll comprising:
an outer shell that forms a shape of the doll;
the outer shell being separated into a head section and a body section, the head and body sections being connected through at least one internal connection;
wherein at least one of the head and the body is movable relative to the other;
a plurality of movable body parts, at least one body part being located at least partially within the body section and at least one body part being located at least partially within the head section;
a plurality of motors disposed within the outer shell, wherein at least one of the plurality of motors is mounted so that is can simultaneous drive a plurality of the automated movements of the doll and wherein at least one of the plurality of motors is mounted to drive a single movement of the doll;
a set of gears associated with each of the motors; the gears configured to step down an output speed of the motor;
a cam mechanism associated with each of the motors and a follower associated with at least one of the cam mechanisms;
at least one of the cam mechanisms including a groove, wherein the groove acts as a guide path for the associated follower; and
at least one controller associated with at least one of the motors, wherein the controller provides the automated movements of the body parts by starting and stopping the motor.
2. The doll according to claim 1 wherein the head rotates left and right relative to the body.
3. The doll according to claim 2 further comprising a base section, wherein the doll is supported by the base section.
4. The doll according to claim 3 wherein the body section tilts relative to the base when the head rotates left and right.
5. The doll according to claim 1 wherein the head tilts to the left and to the right relative to the body.

6. The doll according to claim 1 wherein the head tilts to the front and back relative to the body.
7. The doll according to claim 6 wherein the head tilts to the front relative to the body.
8. The doll according to claim 6 wherein the doll is a duck, the at least one body part being located at least partially within the head section includes a beak and the beak opening when the head tilts to the front relative to the body.
9. The doll according to claim 1 wherein the controller includes at least one wiper for generating a code associated with a body part movement.
10. The doll according to claim 1 wherein the plurality of motors include direct current motors.
11. The doll according to claim 1 further including a vibrational speaker attached to the head section.
12. An animatronic duck which includes automated moving parts, the duck comprising:
    a base section; the base section including feet and at least one leg;
    the base section housing a body support element; the body support element having a top and the top having a shaft support;
    an axle supported in the shaft support;
    a cam follower supported by the axle, wherein the cam follower rotates about an axis of the axle;
    an outer shell that forms a shape of the duck;
    the outer shell being separated into a head section and a body section, the head and body sections being connected through at least one internal connection;
    a motor connected to the cam follower;
    a set of gears meshed to the motor;
    a horizontal cam mechanism associated with the set of gears; the cam mechanism including a groove, wherein the groove acts as a guide path for the follower;
    a head turning gear horizontally meshed with the set of gears;
    a neck assembly coupled to the head turning gear; and the internal connection coupled to the neck assembly; wherein when the motor operates the head

section turns relative to the body section and the body section tilts relative to the base.

13. The duck according to claim 12 further including a neck housing and a neck cover coupled between the head turning gear and the internal connection.
14. The duck according to claim 13 further comprising another motor secured within the neck assembly and meshed to another set of gears;
another cam mechanism associated with the another set of gears; and another follower associated with the another cam mechanism; wherein the another follower is configured to move in an up and down direction as the another cam rotates;
wherein the internal connection includes a pair of spaced apart linkages, the another follower urging one of the linkages in an upward direction as the another follower moves in the up direction causing the head section to tilt forward relative to the body section.
15. The duck according to claim 14 further including a lower beak hingedly connected to the head section;
a beak linkage assembly connected between the lower beak and an upper portion of the one of the linkages such that as the one of the linkages moves in an upward direction it applies a downward force on the lower beak causing the lower beak to rotate about the hinged connection to the head section.
16. The duck according to claim 12 wherein the motor and the another motor include direct current motors.
17. The duck according to claim 12 further including at least one controller associated with the motor, wherein the controller starts and stops the motor.
18. The duck according to claim 17 wherein the controller includes at least one wiper for generating a code associated with the head turning.

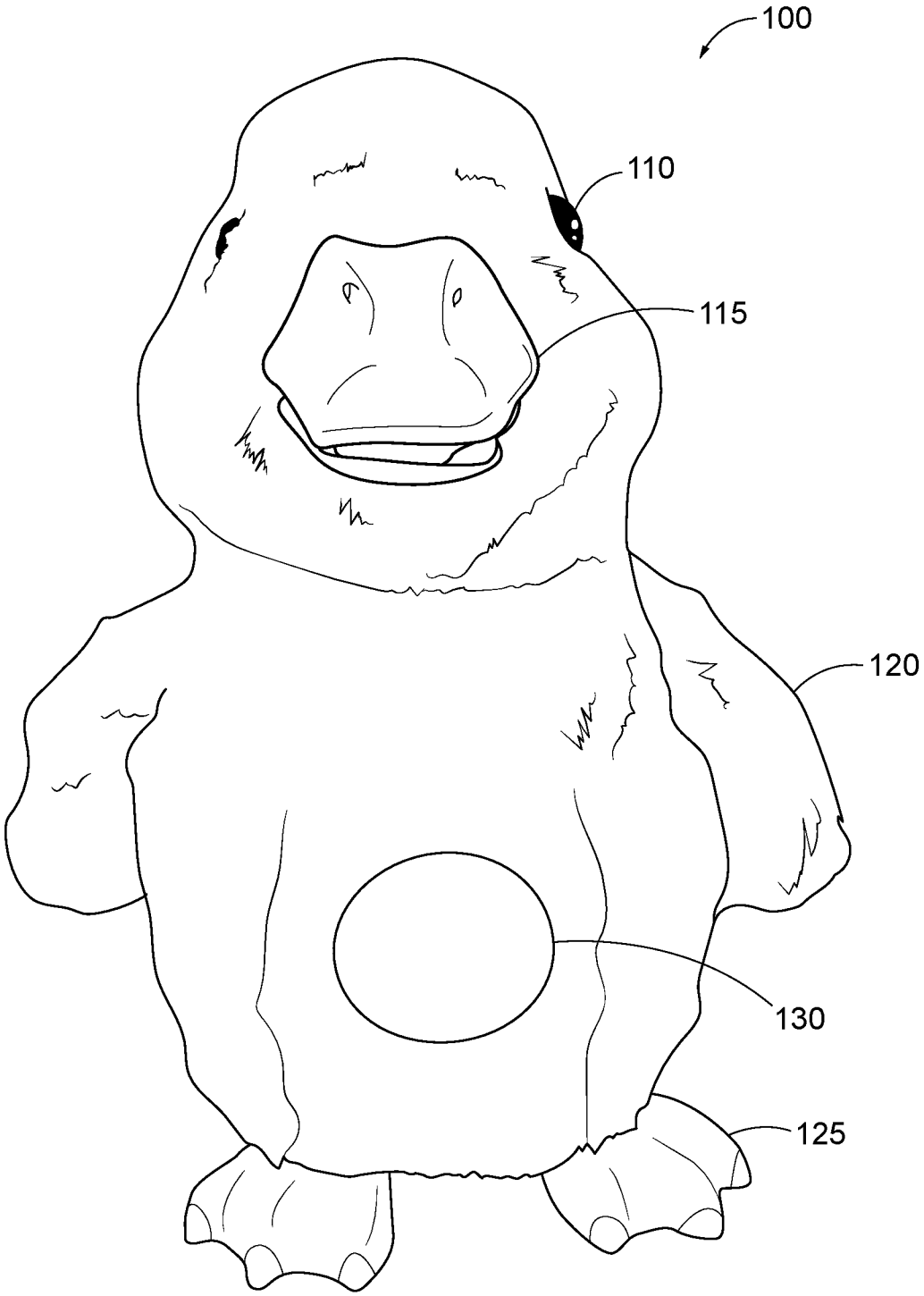

FIG. 1

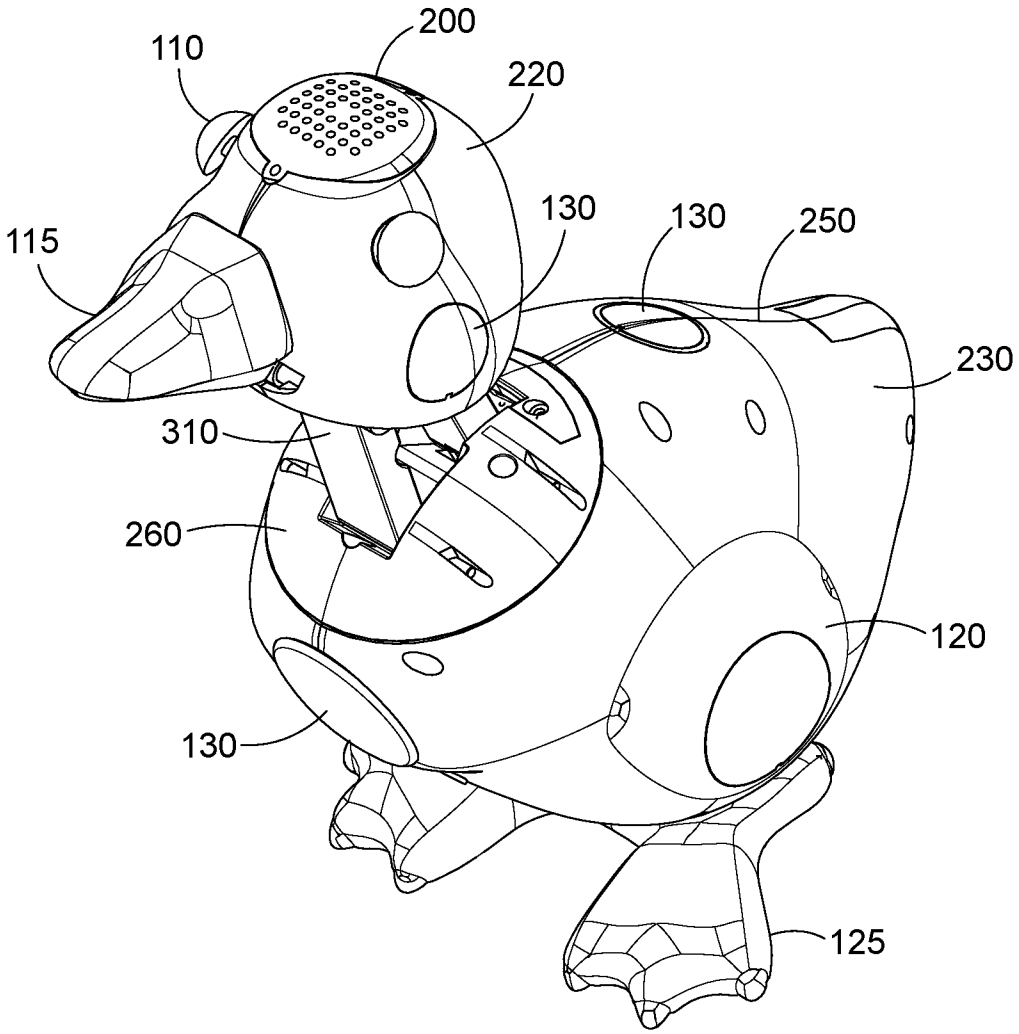

FIG. 2

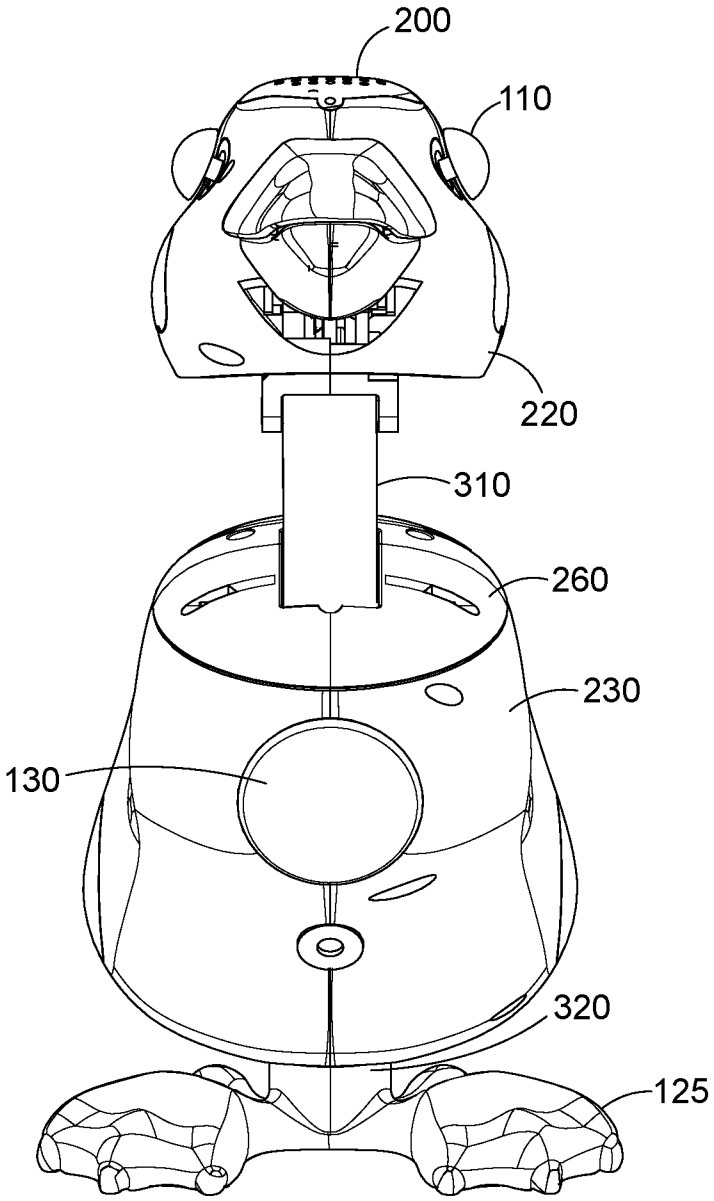

FIG. 3

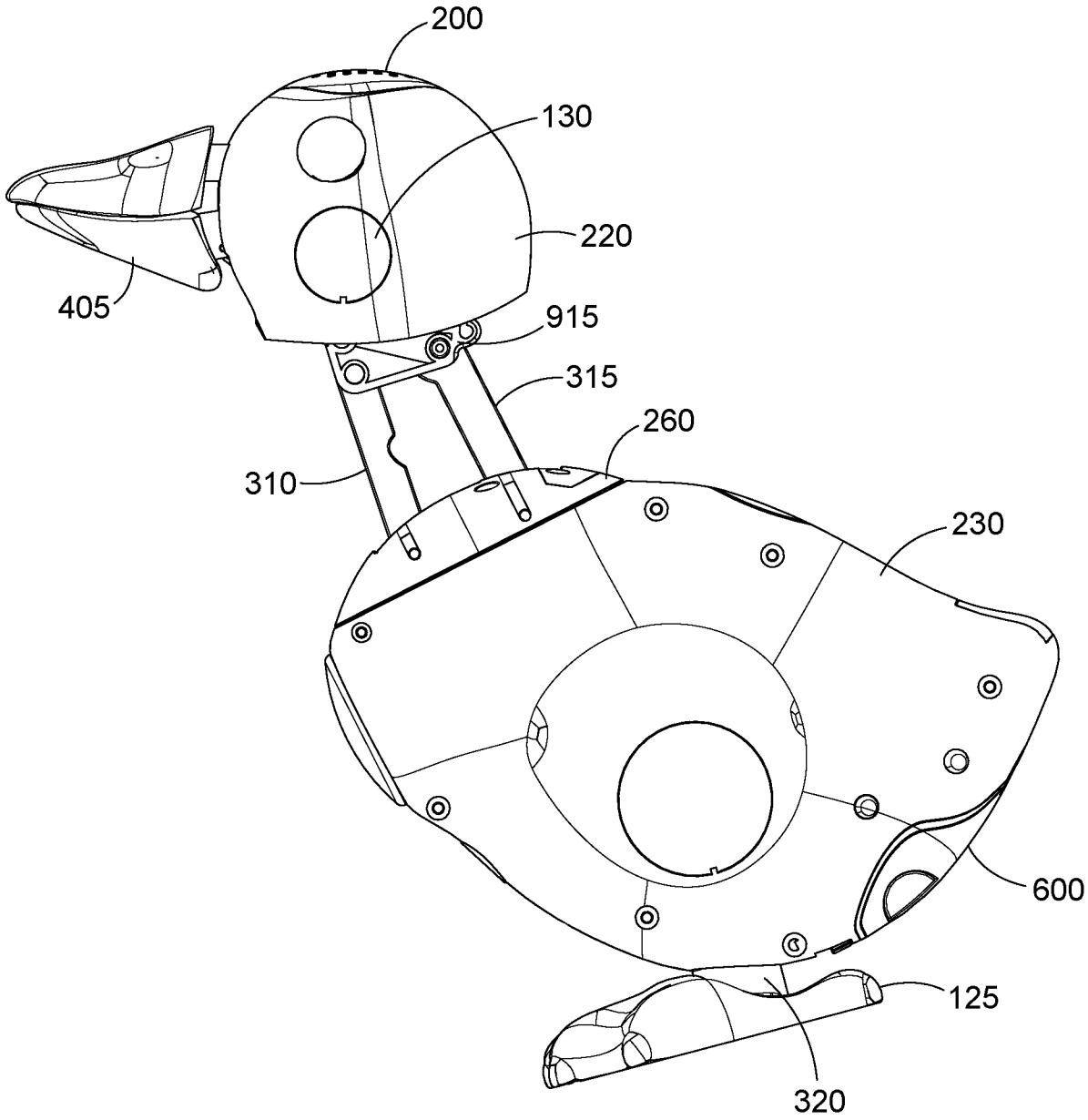

FIG. 4

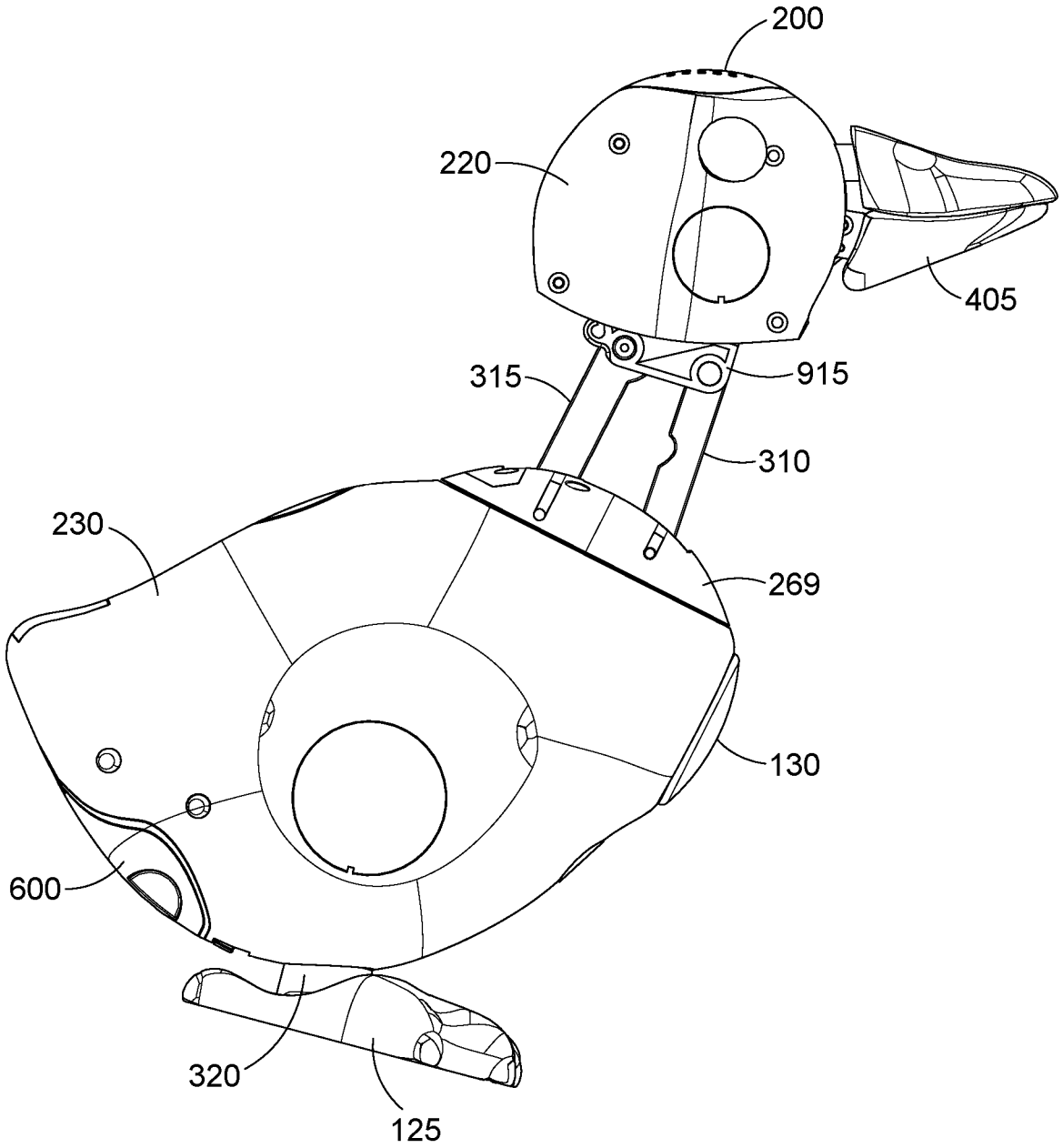

FIG. 5

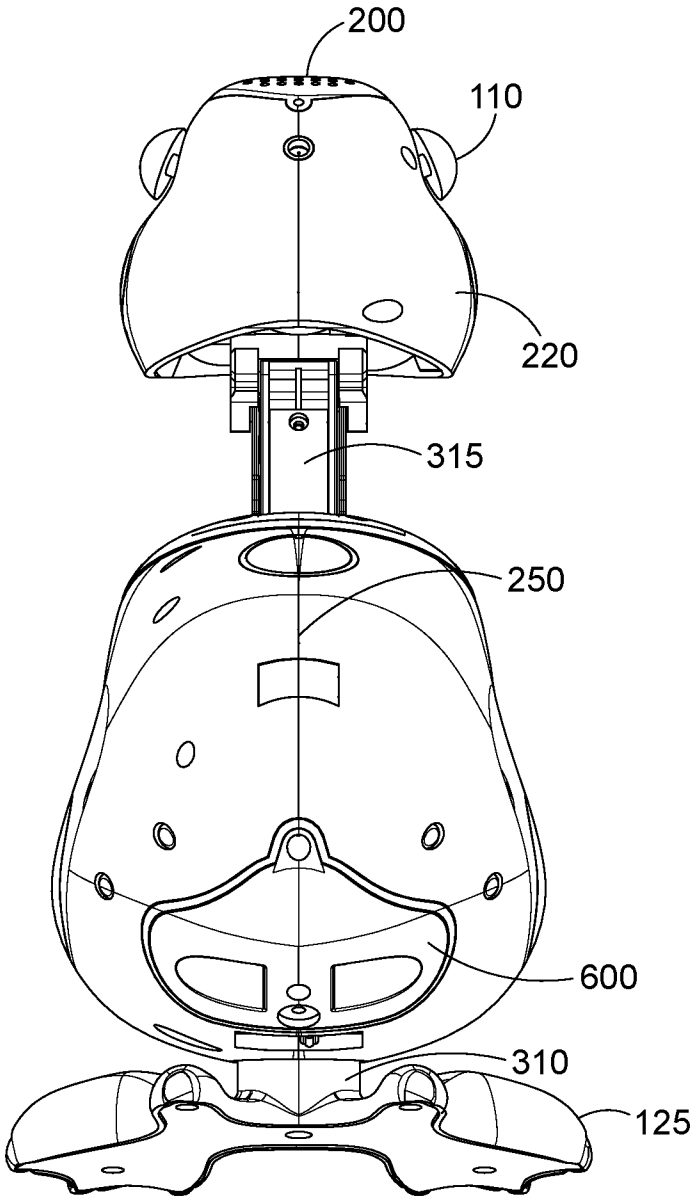

FIG. 6

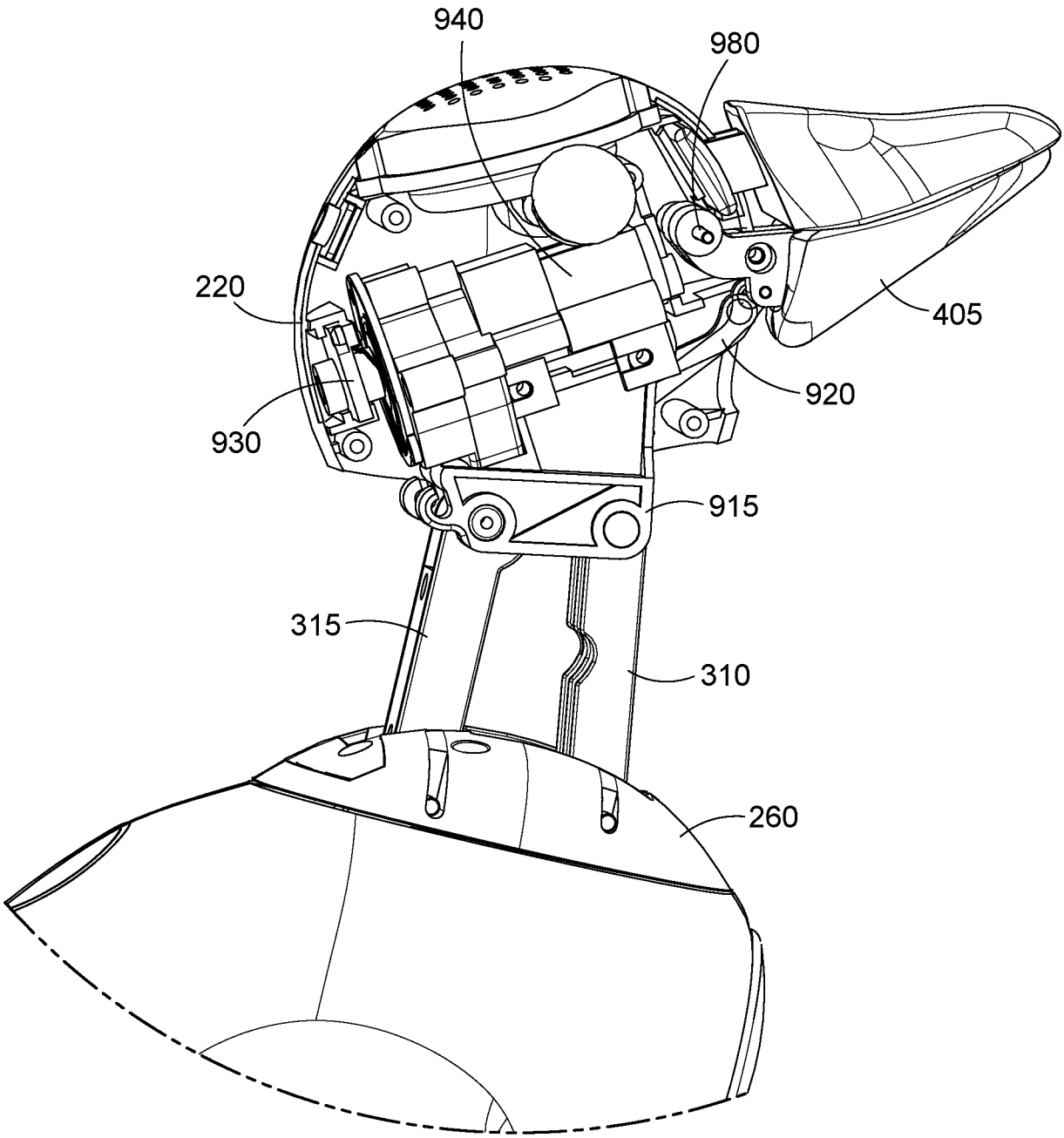

FIG. 7

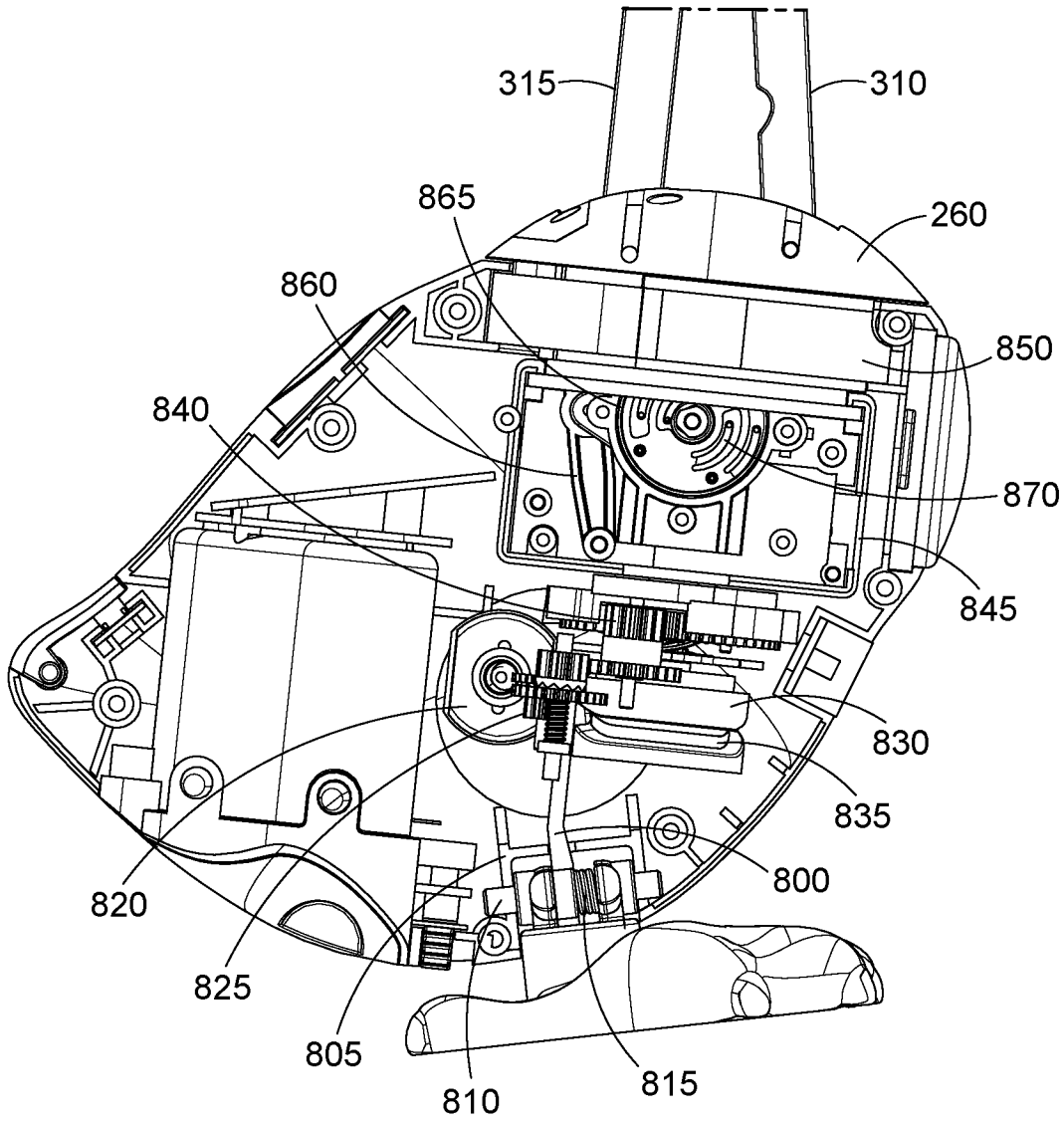
315
310
865
260
860
850
840
870
845
830
835
800
820
825
805
810
815

FIG. 8

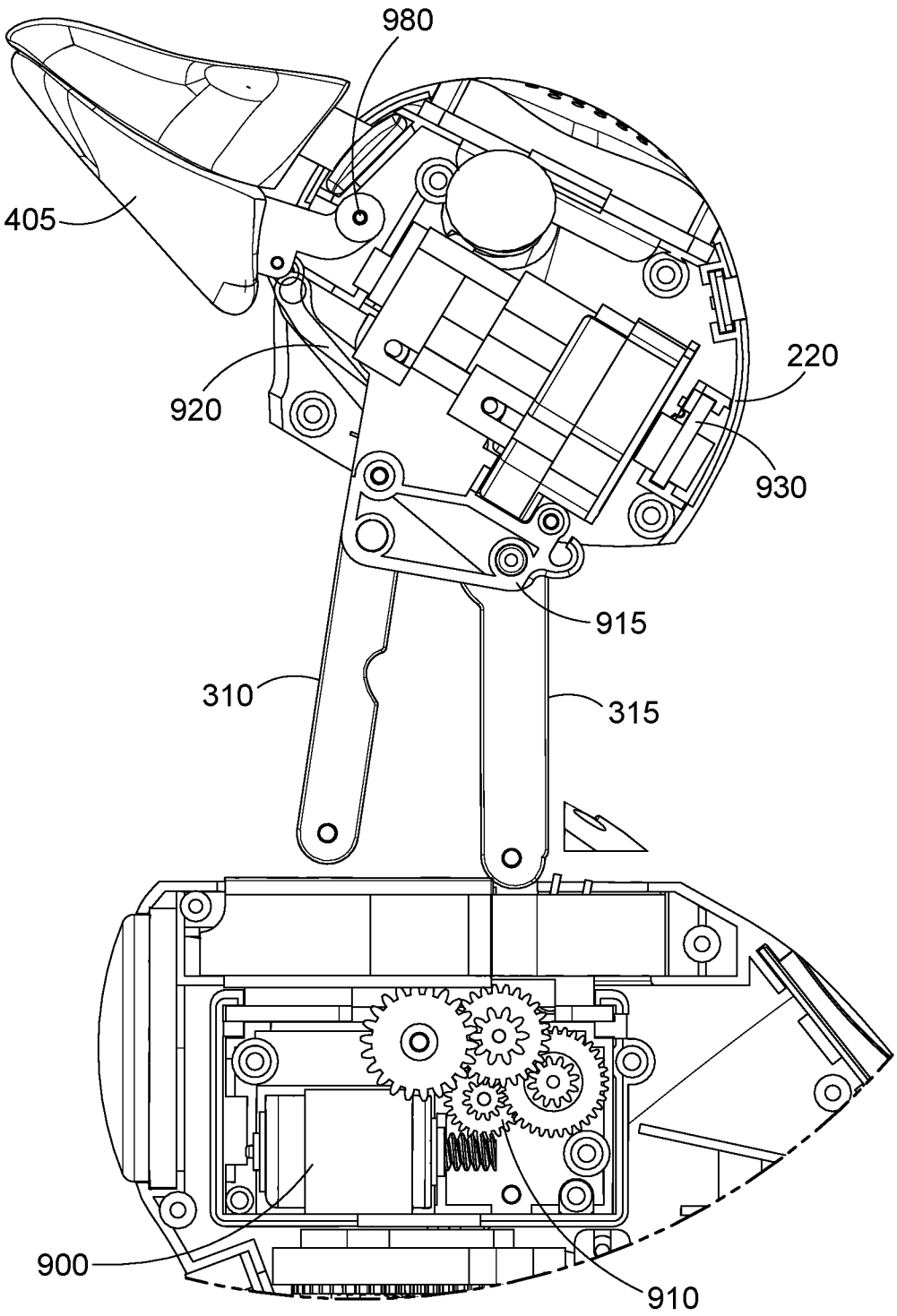

FIG. 9

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 18/23040

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:
See Extra Sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of additional fees.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:
1-11

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.

☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.

☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 18/23040

A. CLASSIFICATION OF SUBJECT MATTER
IPC(8) - A63H 3/28, A63H 3/50, A63H 3/48, A63H 11/00, A63H 13/00, A63H 29/22, A63H 31/08 (2018.01)
CPC - A63H 3/48, A63H 13/005, A63H 3/28, A63H 3/50, A63H 11/00, A63H 13/00, A63H 29/22, A63H 31/08

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
See Search History Document

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
See Search History Document

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
See Search History Document

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 6,017,261 A (WACHTEL) 25 January 2000 (25.01.2000), entire document, especially Fig. 1, 3, 5-6; col. 2, ln. 29-30, 36-40; col. 3, ln. 4-6, 27-35, 40-46, 52-54, 64-67; col. 4, ln. 1-7, 17-21.	1-11
A	US 5,224,896 A (TERZIAN) 06 July 1993 (06.07.1993), entire document, especially Fig. 1-3; col. 1, ln. 6-9; col. 4, ln. 1; col. 8, ln. 1-3, 19-34, 45-49; col. 9, ln. 1-7.	1-11
A	US 2010/0216370 A1 (HOETING) 26 August 2010 (26.08.2010), entire document.	1-11
A	US 4,913,676 A (KOGUCHI et al.) 03 April 1990 (03.04.1990), entire document.	1-11
A	"Robot Duck !! My Mom.." (IMAGINATIVE GUY) 03 July 2016 (03.07.2016); retrieved from internet 31.05.2018; <URL=https://www.youtube.com/watch?v=6S1ad6b2wmA>; entire document.	1-11
X/P	"Kids with Cancer Have New Hope Thanks to the Aflac Duck (Yes, That Duck)" (THIBODEAUX) 09 January 2018 (09.01.2018); retrieved from internet 08.05.2018; <URL=https://www.inc.com/wanda-thibodeaux/how-aflac-is-using-its-iconic-duck-to-treat-kids-with-cancer.html>; entire document.	1-11
X/P	"This Robot Duck Eases Children Through Cancer Treatments" (THE VERGE) 11 January 2018 (11.01.2018); retrieved from internet 09.05.2018; <URL=https://www.youtube.com/watch?v=LQy-qn_JMoM>; entire document.	1-11

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
01 June 2018	02 AUG 2018
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-8300	Authorized officer: Lee W. Young PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

Form PCT/ISA/210 (second sheet) (January 2015)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 18/23040

Continuation of Box No. III - Lack of unity of Invention:

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fees must be paid.

Group I: Claims 1-11, directed to a doll that performs automated movements, controlled by a controller associated with a motor.

Group II: Claims 12-18 directed to an animatronic duck which includes automated moving parts.

The inventions listed as Groups I-II do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons:

SPECIAL TECHNICAL FEATURES

The invention of Group I includes the special technical feature of at least one controller associated with at least one of motor, wherein the controller provides the automated movements of the body parts by starting and stopping the motor, not required by the claims of Group II.

The invention of Group II includes the special technical feature of an animatronic duck comprising a base section housing a body support element having a shaft support and an axle supported in the shaft support; and a neck assembly coupled to a head turning gear, not required by the claims of Group I.

COMMON TECHNICAL FEATURES

Groups I and II share the common technical features of a doll having automated movements, the doll comprising an outer shell that forms a shape of the doll; the outer shell being separated into a head section and a body section, the head and body sections being connected through at least one internal connection and the head section movable relative to the body section; a motor wherein the motor operates a movement; a set of gears associated with the motor; a cam mechanism; and the cam mechanism including a groove, wherein the groove acts as a guide path for an associated cam follower.

However, this shared technical feature does not represent a contribution over prior art as being anticipated by US 5,224,896 A (Terzian).

Terzian teaches a doll having automated movements (col. 1, ln. 6-9; describing a motor driven doll for self supporting movement), the doll comprising an outer shell that forms a shape of the doll (Fig. 1 - see outer shell of doll); the outer shell being separated into a head section (head 30, Fig. 1) and a body section (torso 22, Fig. 1), the head and body sections being connected through at least one internal connection (col. 8, ln. 19-23; describing the head 30 being force fit on the neck plug 292 of torso 22) and the head section movable relative to the body section (col. 8, ln. 24-34; describing head 30 both rocking side to side and rotating side to side relative the torso 22); a motor (DC motor 84, Fig. 3) wherein the motor operates a movement (col. 8, ln. 24-29; describing motor 84 driving the movements of the doll); a set of gears (gears 88, 98, 100, 104, 106, Fig. 3) associated with the motor; a cam mechanism (face cam 108, fig. 2); and the cam mechanism including a groove (cam groove 112, Fig. 2), wherein the groove acts as a guide path for an associated cam follower (cam follower link 250, Fig. 2).

As the common technical features were known in the art at the time of the invention, these cannot be considered special technical features that would otherwise unify the groups.

Therefore, Groups I-II lack unity under PCT Rule 13 because they do not share a same or corresponding special technical feature.