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(71) **Applicant (for all designated States except US):** **MATTEL, INC.** [US/US]; Law Department M1-1220, 333 Continental Boulevard, El Segundo, CA 90245 (US).

(72) **Inventors; and**

(75) **Inventors/Applicants (for US only):** **KING, Paul** [US/US]; 93 Lucas Ct., Newbury Park, CA 91320 (US). **PASKO, Rene, M.** [US/US]; 1822 Spreckels Lane #1, Redondo Beach, CA 90278 (US). **BUSE, Carrie** [US/US]; 950 2nd Street #309, Santa Monica, CA 90403 (US). **WEIDETZ, Erich** [US/US]; 1434 10th Street #5, Santa Monica, CA 90403 (US).

(74) **Agent:** **SHUMAKER, Brantley, C.;** Kolisch Hartwell, P.C., 200 Pacific Building, 520 S.W. Yamhill Street, Portland, OR 97204 (US).

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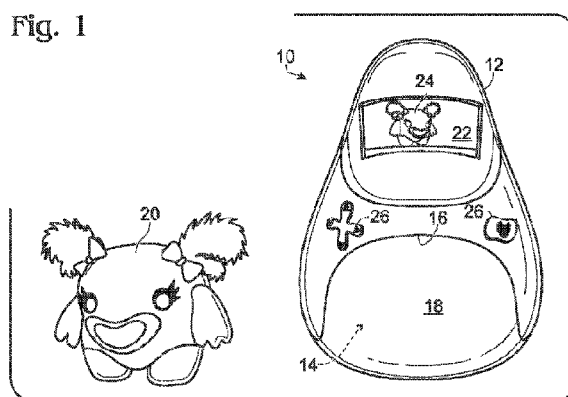
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Fig. 1



(57) Abstract: Electronic toys and methods of interacting with electronic toys are provided, in which the electronic toys include a body defining an interior and an opening into the interior plus a prize removably located in the interior and accessible through the opening. A controller is configured to: make the prize inaccessible through the opening; output instructions to make the prize accessible; receive input in response to the instructions; determine whether the input satisfies a predetermined criterion; and make the prize accessible again through the opening when the input satisfies the predetermined criterion.

ELECTRONIC TOY AND METHODS OF INTERACTING THEREWITHCross Reference to Related Applications

[0001] This application claims priority under 35 U.S.C. § 119(e) to U.S. Provisional Patent Application No. 61/089,434, filed on August 15, 2008, entitled "INTERACTIVE VIDEO TOY", the disclosure of which is incorporated herein by reference.

Background

[0002] Electronic toys exist that are adapted to display virtual characters on a video screen. Examples of electronic toys are found in the following patents: US5572646, US5685776, US5893798, US6037952, US6043822, US6061071, US6118458, US6213871, US6313843, and US6633295. Examples of toys that spawn and/or hide another toy are found in US6702644. The disclosures of all the patent applications, patents and other publications recited in this application are incorporated herein by reference in their entirety for all purposes.

Summary

[0003] An electronic toy and methods of interacting with an electronic toy are provided. The electronic toy may include a body defining an interior and an opening into the interior; a prize removably located in the interior and accessible through the opening; and a controller configured to: make the prize inaccessible through the opening; output instructions to make the prize accessible; receive input in response to the instructions; determine whether the input satisfies a predetermined criterion; and make the prize accessible again through the opening when the input satisfies the predetermined criterion.

Brief Description of the Drawings

[0004] Figs. 1 and 2 are views of an example embodiment of an electronic toy from the front and side, respectively.

[0005] Fig. 3 is an exploded view of an example embodiment of an electronic toy.

[0006] Fig. 4 is a schematic view of components in an example embodiment of an electronic toy.

[0007] Fig. 5 depicts example instructions on a display of one embodiment.

[0008] Figs. 6 and 7 depict an example embodiment of an electronic toy in a nominal configuration where a prize is visible and accessible through an opening in the body.

[0009] Figs. 8 and 9 depict the example embodiment of Figs. 5 and 6 in an active configuration where a virtual character is “lost,” and where the prize is concealed within the interior of the toy.

[0010] Fig. 10 is a flowchart demonstrating an example method, according to the disclosure.

Detailed Description

[0011] Figs. 1 and 2 are front and side views, respectively, of an example electronic toy 10. Toy 10 includes a body 12 defining an interior 14 that is accessible via an opening 16. Body 12 may be configured to resemble various shapes, such as simple geometric shapes like a cylinder, ergonomic shapes, or shapes of various characters. A drawer 18 may be included to move through opening 16 relative to body 12 and to provide access to interior 14 via opening 16. A prize 20 may be removably located in interior 14 so that it is accessible through opening 16. Prize 20 may be various objects or trinkets, such as a plush toy resembling a character.

[0012] A display 22 may be included on body 12 and may be configured to depict a virtual character 24. In exemplary embodiments, virtual character 24 resembles the same character as prize 20. Display 22 may be may an electronic screen, such as a Liquid Crystal Display (“LCD”). One or more user controls 26 may also be provided to allow a user to control the actions of virtual character 24 on display 22. User controls 26 may take the forms of various input devices, such as buttons, knobs, control pads, joysticks, and the like, and may output signals representative of a user’s manipulation of the controls. Audio-producing devices such as speakers may also be provided to produce sound effects. Some embodiments may not include a display, and may instead send sensory output to users in other ways, such as audible, visual (e.g., flashing lights) and/or haptic feedback.

[0013] Toy 10 may be altered between a nominal configuration, or “normal mode,” and an active configuration, or “runaway mode.” When toy 10 is in normal mode, a user may interact with virtual character 24 on display 22 with user controls 26. Prize 20 is stored within interior 14 so that it is accessible through opening 16 by, for example, opening drawer 18.

[0014] At various points during gameplay, virtual character 24 depicted on display 22 may “run away,” causing toy 10 to enter “runaway mode.” For example, virtual character 24 may appear to run off display 22, indicating that toy 10 has entered “runaway mode.” When toy 10 enters “runaway mode,” prize 20 may become inaccessible through opening 16. For example, if a user opens drawer 18, prize 20 will appear to have vanished, indicating that the prize “ran away.”

[0015] Fig. 3 is an exploded view of an exemplary toy, similar to those shown in Figs. 1 and 2. Prize 20 is stored in a first compartment 28 of interior 14 that is accessible through opening 16 when toy 10 is in its nominal configuration. A second

compartment 30 is defined within interior 14 and may become accessible through opening 16 when toy 10 switches to its active (runaway) configuration.

[0016] A separator 32 is provided (as part of an inner drawer 34 in Fig. 3) to separate first compartment 28 and second compartment 30 from one another. When electronic toy 10 is in its nominal configuration, first compartment 28 may be substantially similar in size and shape to second compartment 30 when toy 10 is in its active configuration, providing the illusion that the first and second compartments are one and the same. As will be described below, separator 32 may be selectively secured to drawer 18 or to body 12 in order to selectively define first compartment 28 and second compartment 30.

[0017] In some embodiments, inner drawer 34 includes a prize sensor 38, such as a leaf sensor, that is configured to detect the presence of prize 20 within first compartment 28. In some embodiments, if no prize 20 is detected, toy will not switch from its nominal configuration to its active (runaway) configuration, leaving first compartment 28 accessible through opening 16.

[0018] Fig. 4 schematically depicts components of an example electronic toy 10. A controller 40, which may be a microprocessor, ASIC, or other specialized logic device such as the GPL132A from General Plus Technology, Inc., may be contained within interior 14 and may be configured to control various components of toy 10. For example, controller 40 may be connected via a bus 42 to one or more of a motion sensor 44, a motor 46, one or more speakers 47, a rumble mechanism 48, one or more lights 49, display 22, user controls 26 and prize sensor 38. Motion sensor 44 may be various mechanisms, including a ball within a housing or cage, such as those described in U.S. Patents US3742478, US4196429 or US4688025, the disclosures of which are incorporated by reference.

[0019] Controller 40 may be configured to cause display 22 to display one or more virtual environments, as well as virtual character 24 interacting therewith. A user may operate user controls 26 to send signals to controller 40, so that controller 40 causes virtual character 24 to perform tasks, play games, and/or participate in activities within the virtual environments, as instructed by the user.

[0020] At various points during gameplay, controller 40 also may be configured to alter toy 10 from its nominal configuration, where prize 20 is accessible through opening 16, to its active (runaway) configuration, where prize 20 is inaccessible through opening 16. Controller 40 may then output instructions 50 on display 22 that a user may follow to make prize 20 accessible. For example, in the embodiment shown in Fig. 5, controller 40 causes display 22 to show instructions 50 in the form of directional arrows that are meant to cause a user to walk in various directions under the subterfuge that the user is looking in her own real-world environment (e.g., her home) for the “lost” virtual character 24. Other clues that may be used to instruct a user how to find the runaway virtual character 24 include hot/cold indicators, footprints, sounds, and the like.

[0021] In one embodiment, toy 10 may be configured to mimic audibly the sound of a character moving from a first position relative to toy 10 to a second position, in order to prompt a user to “chase” the character. For example, toy 10 may include speakers 47 on each side. Controller 40 first may cause a speaker 47 on a first side to output the sound of footsteps. Controller may then silence the speaker 47 on the first side and cause the sound of footsteps to be output through the speaker 47 on the other side of toy, or a slow transition may be created with the sound of footsteps progressing from one speaker 47 to another of speaker 47. The effect is that a user believes they have heard something move from the first side to the second side.

[0022] Controller 40 next receives input from a user, typically in response to instructions 50, and determines whether the input satisfies a predetermined criterion. If the input satisfies the predetermined criterion, controller 40 may make prize 20 accessible again through opening 16. The input may be received from various sources, such as user controls 26 and motion sensor 44. The predetermined criterion may include one or more conditions, such as whether a user has completed enough levels or achieved a high enough score.

[0023] In embodiments where controller 40 causes display 22 to output instructions to move toy 10 in various directions, motion sensor 44 sends a signal to controller 40 when toy 10 is moved. In some such embodiments, controller 40 accumulates output from motion sensor 44 into a cumulative datum or value and compares the cumulative datum to a predetermined threshold. For example, motion sensor 44 may be configured to detect when a user takes a step, or the direction thereof, and controller 40 may accumulate the number and/or direction of steps into a cumulative motion datum. If the cumulative datum equals or exceeds the predetermined threshold, controller 40 may make prize 20 accessible again through opening 16.

[0024] In some embodiments, as the cumulative datum approaches the predetermined threshold, electronic toy 10 may provide feedback indicating that the user is “close” to finding the runaway virtual character 24. For example, controller 40 may cause speakers 47 to output sound, and in some cases may increase the volume of the sound as the cumulative datum approaches the predetermined threshold. Additionally or alternatively, controller 40 may cause lights 49 to illuminate, and in some cases may increase the luminosity or the frequency of

flashing of lights 49 as the cumulative datum approaches the predetermined threshold.

[0025] Phenomenon other than motion also may be detected by toy 10 as input. Toy 10 may include, in addition to or alternatively to motion sensor 44, sensors for detecting light or temperature. For example, a controller 40 may detect changes in a signal received from a photo or light sensor that are caused by movement of toy 10 relative to one or more light sources, as may be caused by a child walking around while holding toy 10. Controller 40 may accumulate these changes in the signal as a proxy for movement of toy 10.

[0026] A controller 40 in another embodiment may implement a similar process with respect to changes in temperature. A user may be instructed to carry toy 10 to various environments that presumably have different temperatures (e.g., indoors versus outdoors). Controller 40 may accumulate resulting changes in a signal from a temperature sensor as a proxy for movement.

[0027] Toy 10 may provide various types of feedback when a user “finds” a runaway virtual character 24. For example, rumble mechanism 48 may be configured to provide haptic feedback (e.g., vibration of toy 10). Additionally or alternatively, display 22 may provide one or more animations, and other output components such as speakers 47 and lights 49 may provide additional outputs.

[0028] Toy 10 may be altered between its nominal configuration, where prize 20 is accessible through opening 16, and its active configuration, where prize 20 is inaccessible through opening 16, in various ways. Figs. 6-9 depict an example toy 10 that has similar components to the example shown in Fig. 3. Figs. 6 and 7 are front and side views, respectively, of toy 10 in its nominal configuration (i.e. virtual character 24 has not “run away”). First compartment 28 of interior 14 is accessible

via opening 16 and separator 32 is secured to drawer 18 and not secured to body 12 so that as drawer 18 is opened, separator 32 and inner drawer 34 move with drawer 18.

[0029] Figs. 8 and 9 depict front and side views, respectively, of the toy 10 of Figs. 6 and 7 in its active (runaway) configuration. Separator 32 is engaged with body 12 so that when drawer 18 is opened, separator 32 and inner drawer 34 remain stationary relative to body 12. Thus, when drawer is opened, second compartment 30 is visible and accessible, and first compartment 28 is concealed, so that prize 20 appears to have disappeared or “run away.”

[0030] Fig. 10 depicts an example method of using an electronic toy such as those described here. In step 100, a prize is placed within the interior of a toy so that it is accessible through an opening of the toy. In step 102, the toy is altered to make the prize inaccessible. In step 104, instructions are output (e.g., on display 22) to users that indicate how users can make the prize accessible once again. In step 106, the toy receives input in response to the instructions. As noted above, input can be received through user controls 26 or motion sensor 44. In step 108, the input (e.g., cumulative motion of the electronic toy 10 as measured by motion sensor 44 and represented by the cumulative motion datum) is compared to a predetermined criterion (e.g., minimum movement threshold). If the predetermined criterion is met, the toy is altered to make the prize once again accessible through the opening in step 110.

[0031] While embodiments of a toy and methods of toy play have been particularly shown and described, many variations may be made therein. This disclosure may include one or more independent or interdependent embodiments directed to various combinations of features, functions, elements and/or properties.

Other combinations and sub-combinations of features, functions, elements and/or properties may be claimed later in a related application. Such variations, whether they are directed to different combinations or directed to the same combinations, whether different, broader, narrower or equal in scope, are also regarded as included within the subject matter of the present disclosure. Accordingly, the foregoing embodiments are illustrative, and no single feature or element, or combination thereof, is essential to all possible combinations that may be claimed in this or a later application. Each example defines an embodiment disclosed in the foregoing disclosure, but any one example does not necessarily encompass all features or combinations that may be eventually claimed. Where the description recites “a” or “a first” element or the equivalent thereof, such description includes one or more such elements, neither requiring nor excluding two or more such elements. Further, ordinal indicators, such as first, second or third, for identified elements are used to distinguish between the elements, and do not indicate a required or limited number of such elements, and do not indicate a particular position or order of such elements unless otherwise specifically stated.

What is claimed is:

1. An electronic toy comprising:
a body defining an interior adapted to receive a prize and an opening into the interior; and
a controller configured to:
make the interior inaccessible through the opening;
output instructions;
receive input in response to the instructions;
determine whether the input satisfies a predetermined criterion; and
make the interior accessible again through the opening when the input satisfies the predetermined criterion.
2. The electronic toy of claim 1, further comprising a motion sensor, wherein the input includes output from the motion sensor.
3. The electronic toy of claim 2, wherein the controller is further configured to accumulate the output from the motion sensor into a cumulative motion datum, and wherein determining whether the input satisfies the predetermined criterion includes comparing the cumulative motion datum to a predetermined threshold.
4. The electronic toy of claim 3, wherein the motion sensor is configured to detect a direction of motion.

5. The electronic toy of claim 3, wherein the controller is further configured to output instructions to move the electronic toy.
6. The electronic toy of claim 5, further comprising a first speaker on one side of the toy and a second speaker on another side of the toy, wherein the instructions to move the electronic toy include audio that is output first from the first speaker and then from the second speaker.
7. The electronic toy of claim 1, further comprising a temperature sensor, wherein the input includes output from the temperature sensor.
8. The electronic toy of claim 1, further comprising a light sensor, wherein the input includes output from the light sensor.
9. The electronic toy of claim 1, wherein the controller is further configured to output a virtual character on a display and to control the virtual character based on signals received from one or more user controls.
10. The electronic toy of claim 9, wherein the prize is an object that resembles the virtual character.
11. The electronic toy of claim 9, wherein the controller is further configured to remove the virtual character from the display, indicating that the interior is no longer accessible through the opening.

12. The electronic toy of claim 1, further comprising a rumble mechanism configured to rumble the electronic toy when the input satisfies the predetermined criterion.

13. The electronic toy of claim 1, further comprising a light, wherein the controller is configured to illuminate the light when the input satisfies the predetermined criterion.

14. The electronic toy of claim 1, further comprising a speaker, wherein the controller is configured to output audio through the speaker when the input satisfies the predetermined criterion.

15. The electronic toy of claim 1, further comprising:
first and second compartments located within the interior, the electronic toy being alterable between a nominal configuration where the first compartment is accessible through the opening and the second compartment is inaccessible, and an active configuration where the second compartment is accessible through the opening and the first compartment is inaccessible.

16. The electronic toy of claim 15, further comprising:
a drawer that moves through the opening relative to the body; and
a separator that moves relative to the drawer and separates the first and
second compartments;
wherein the separator is secured to the drawer when the electronic toy is in
the nominal configuration and the separator is secured to the body
when the electronic toy is in the active configuration.

17. The electronic toy of claim 16, further comprising a motor that is
operated by the controller to secure the separator to the drawer when the electronic
toy is in the nominal configuration and to secure the separator to the body when the
electronic toy is in the active configuration.

18. The electronic toy of claim 15, further comprising a prize sensor
adapted to detect whether the prize is contained within the first compartment, and
wherein the controller is further configured to prevent alteration of the electronic toy
from the nominal configuration to the active configuration when the prize is not within
the first compartment.

19. The electronic toy of claim 15, wherein the first compartment is, when
the electronic toy is in the nominal configuration, substantially similar in size and
shape to the second compartment when the electronic toy is in the active
configuration.

20. A method of interacting with an electronic toy to access a prize contained within a body of the toy, the body defining an interior and an opening into the interior, the method comprising:

placing the prize in the interior to be accessible through the opening;
altering the toy to make the prize inaccessible through the opening;
outputting instructions;
receiving input in response to the instructions;
determining whether the input satisfies a predetermined criterion; and
altering the toy when the input satisfies the predetermined criterion to make the prize accessible.

21. The method of claim 20, wherein altering the toy to make the prize inaccessible includes altering first and second compartments contained within the interior from a nominal configuration, where the first compartment is accessible through the opening and the second compartment is inaccessible, to an active configuration where the second compartment is accessible through the opening and the first compartment is inaccessible; and

wherein altering the toy to make the prize accessible includes altering the first and second compartments from the active configuration to the nominal configuration.

22. The method of claim 20, wherein receiving input further comprises detecting movement of the toy.

23. The method of claim 22, wherein determining whether the input satisfies the predetermined criterion includes accumulating the detected movement of the toy into a cumulative datum and comparing the cumulative datum to a predetermined threshold.

24. The method of claim 22, wherein outputting instructions includes displaying instructions on a display to move the toy.

25. An electronic toy, comprising:

a body defining an interior and an opening into the interior;

a display;

first and second compartments located within the interior;

a plush doll removably positionable in the first compartment; and

a controller operably coupled to the display and configured to:

alter the toy from a nominal configuration, where the first compartment

is accessible through the opening and the second compartment

is inaccessible, to an active configuration, where the second

compartment is accessible through the opening and the first

compartment is inaccessible;

output instructions on the display;

receive input in response to the instructions;

determine whether the input satisfies a predetermined criterion; and

alter the toy from the active configuration back to the nominal

configuration when the input satisfies the predetermined

criterion so that the plush doll is once again visible and

accessible through the opening.

26. The electronic toy of claim 25, further comprising a motion sensor,
wherein the input includes output from the motion sensor.

1/5

Fig. 1

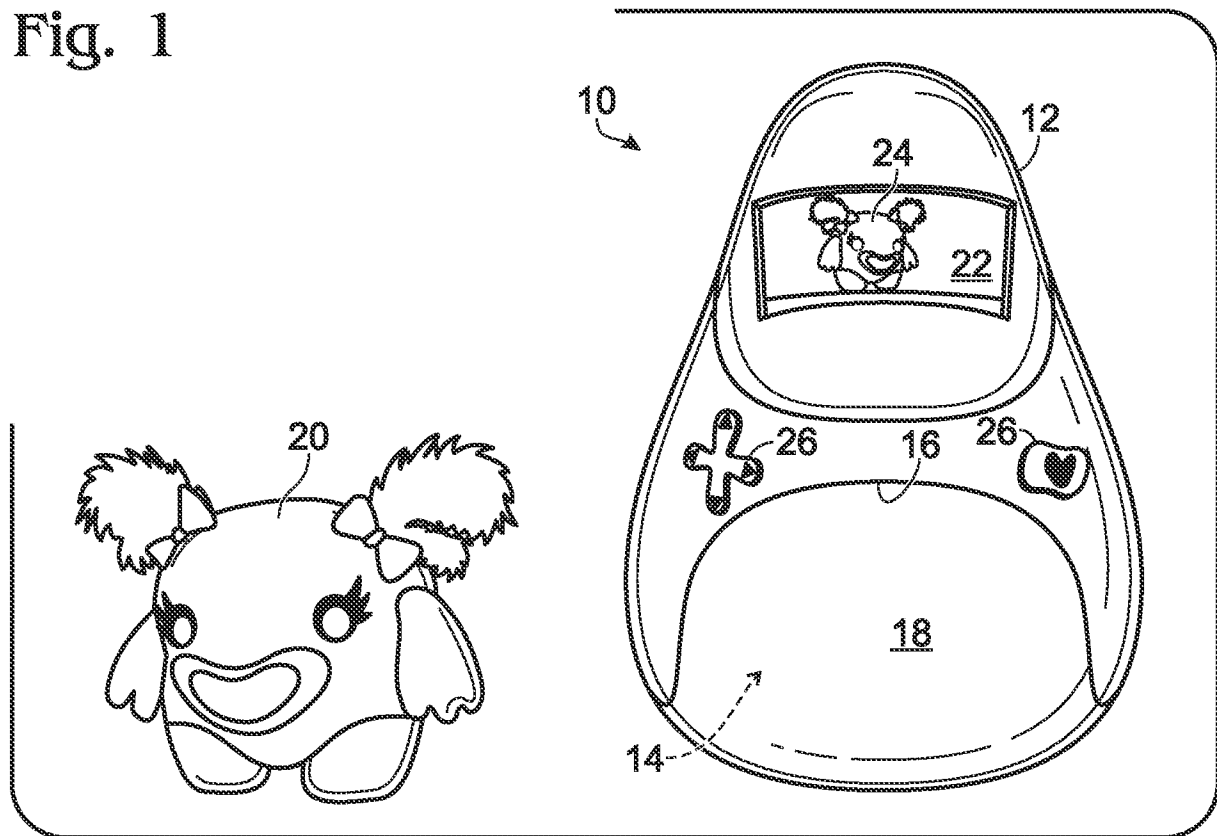
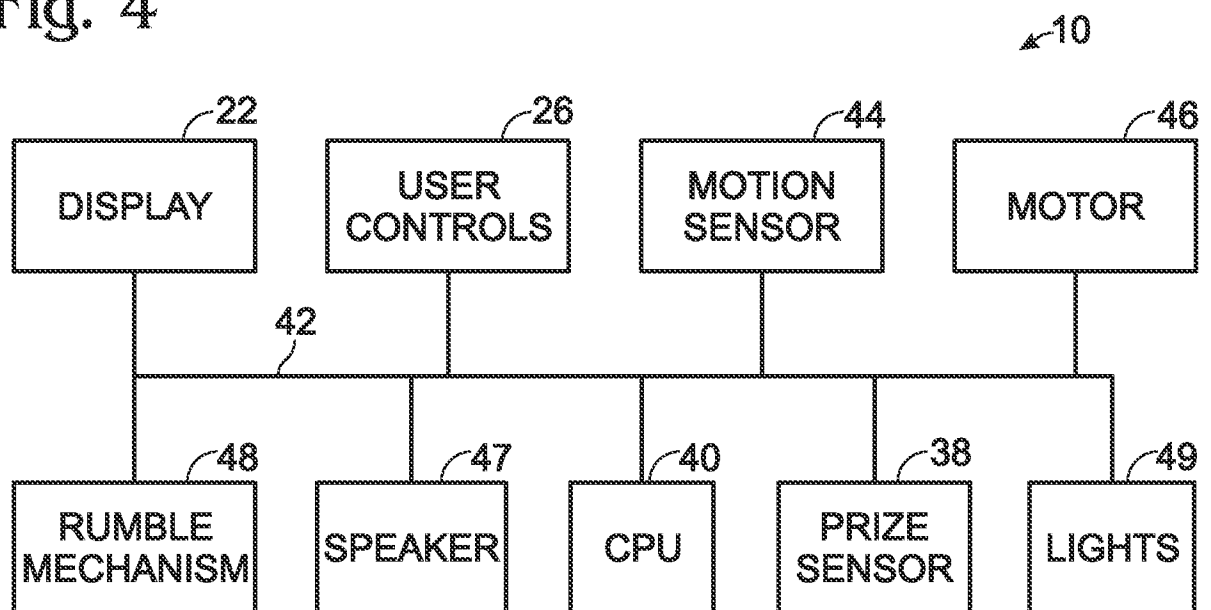


Fig. 4



2/5

Fig. 2

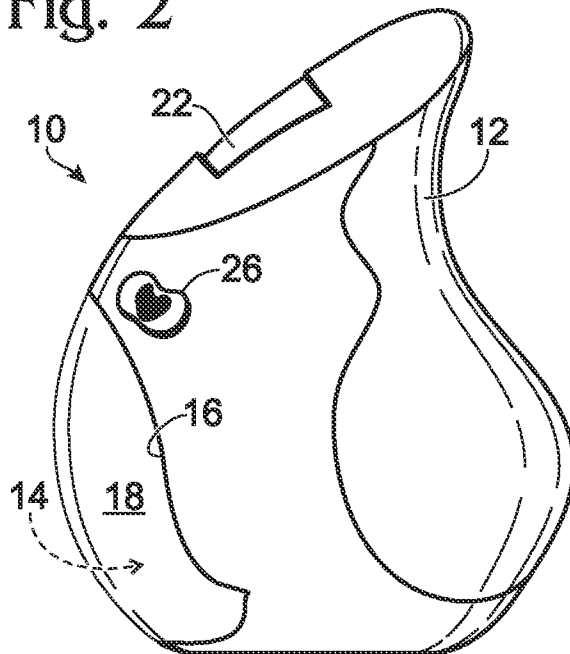


Fig. 5

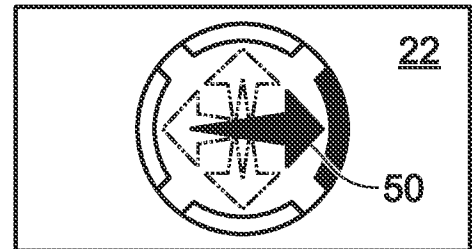
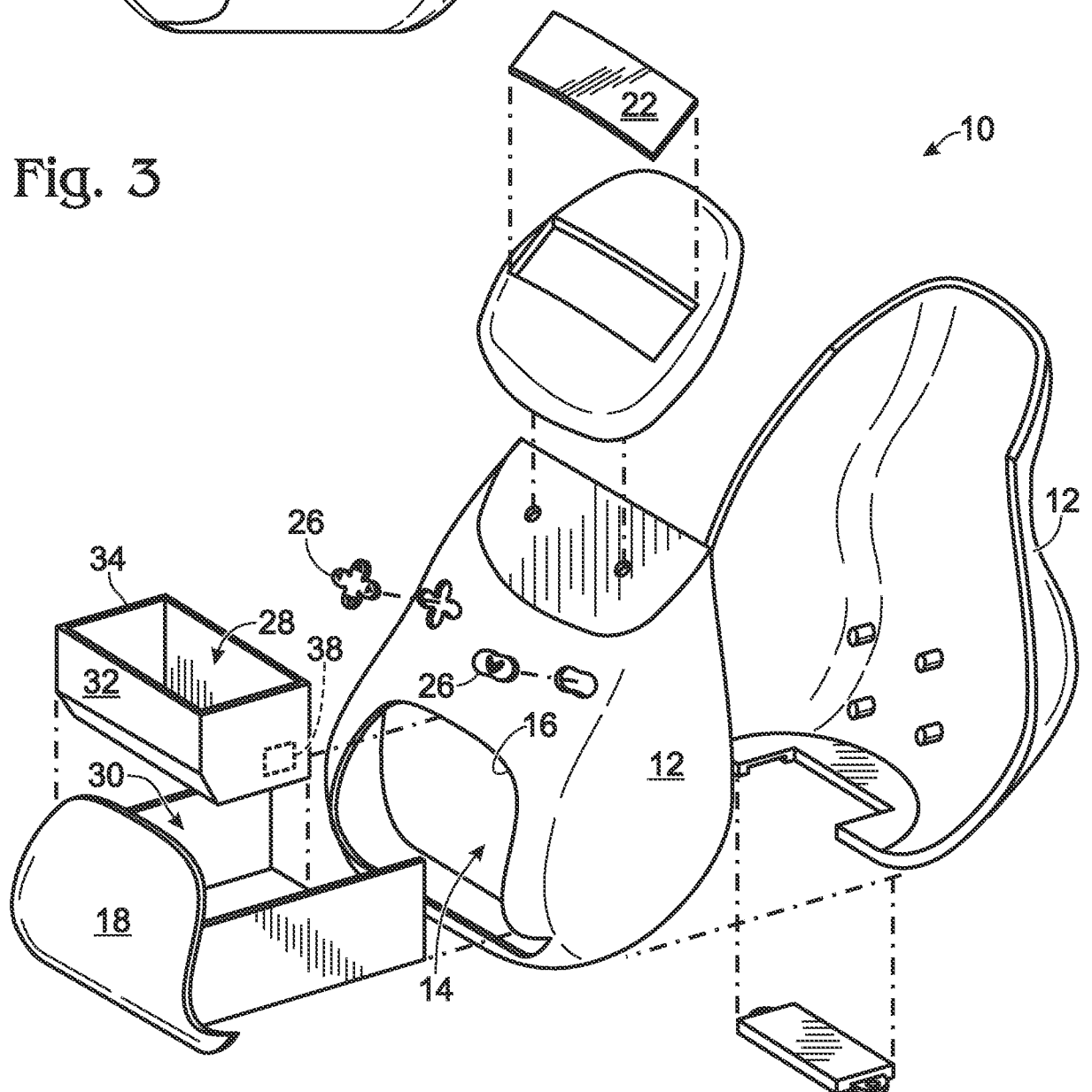


Fig. 3



3/5

Fig. 6

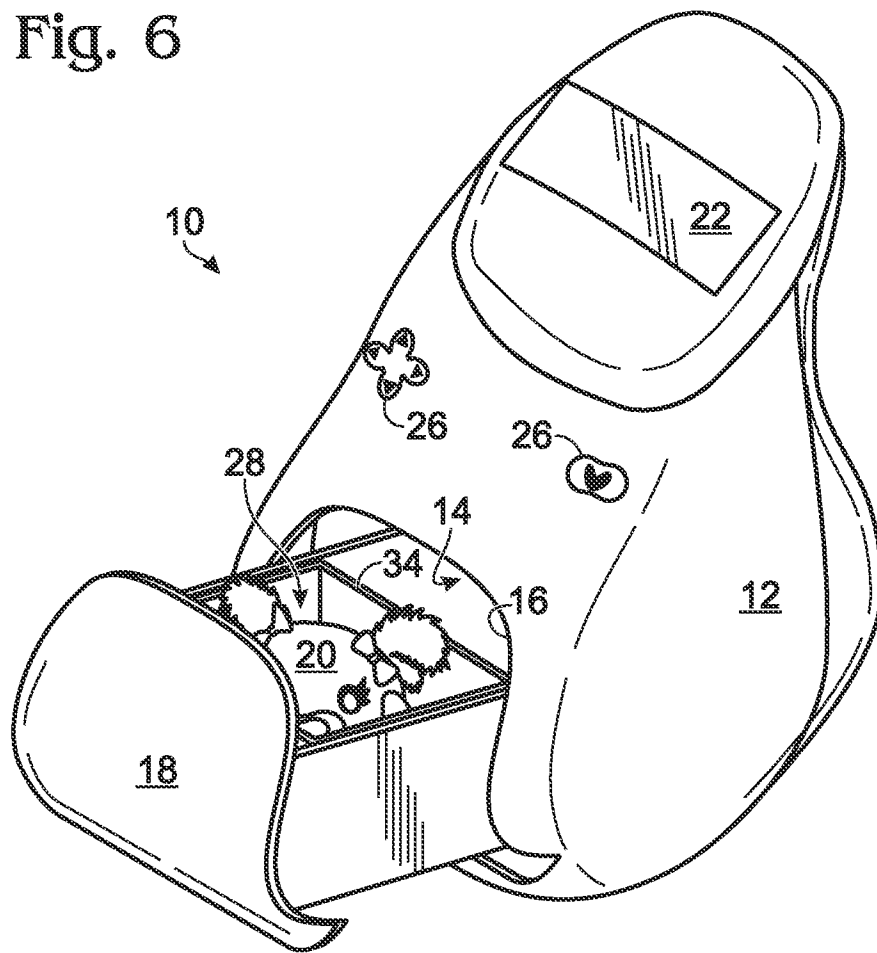
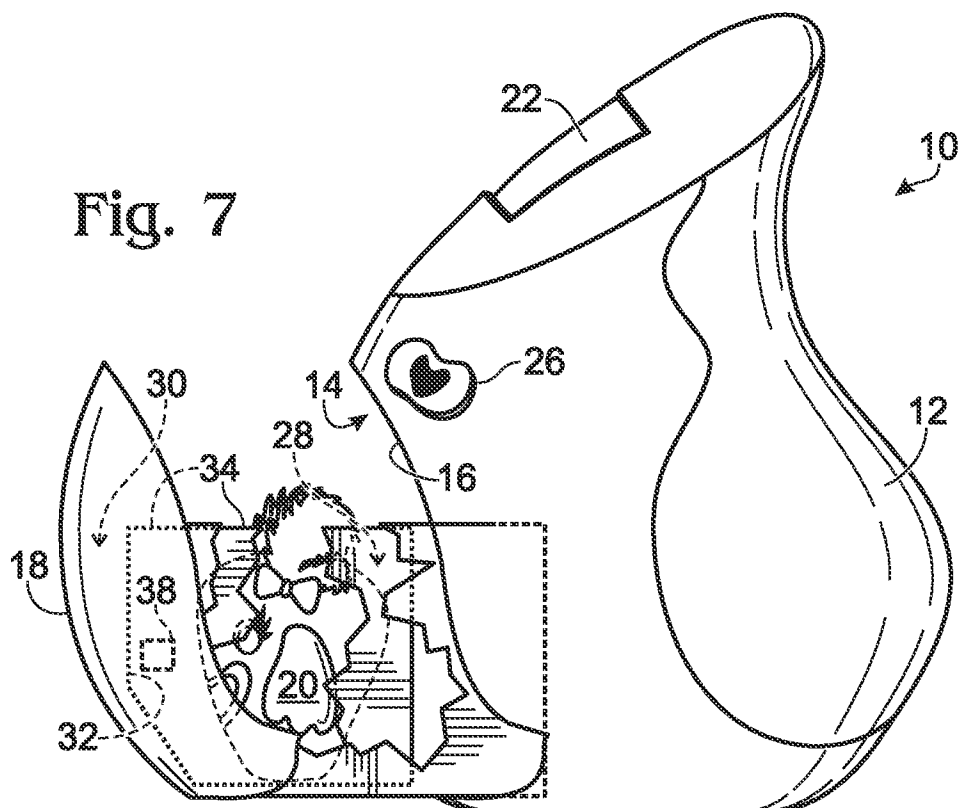


Fig. 7



4/5

Fig. 8

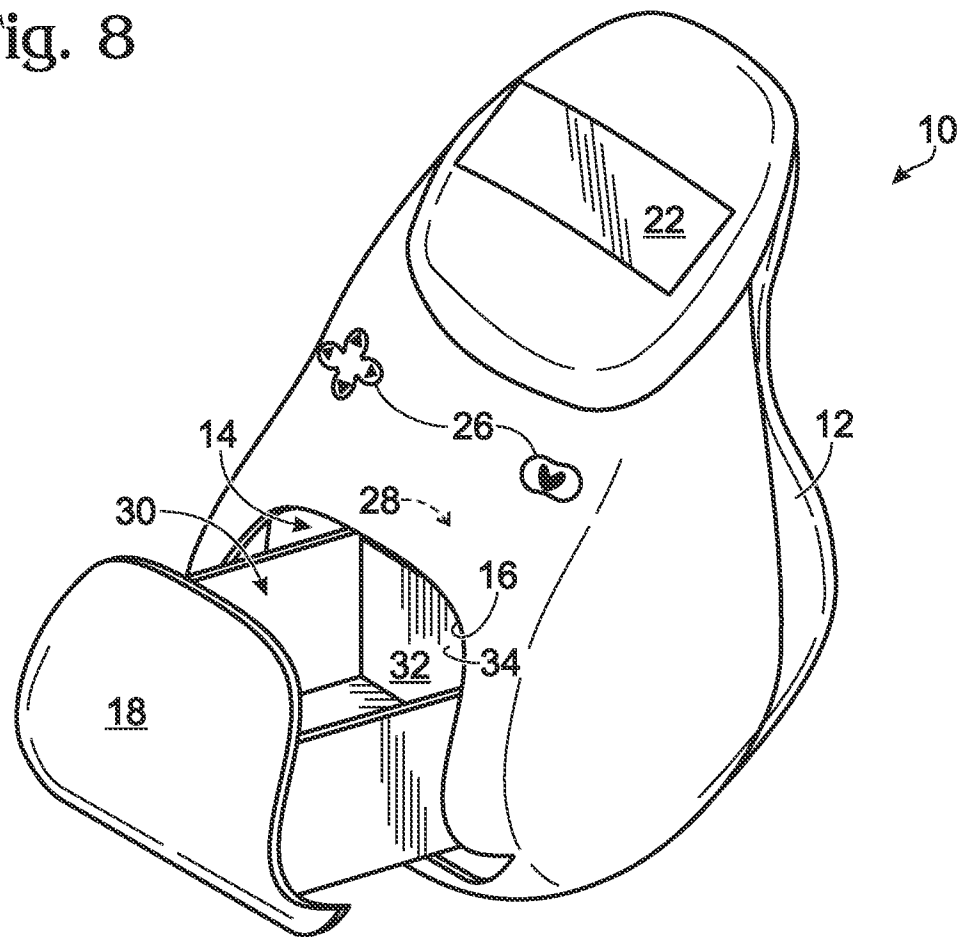
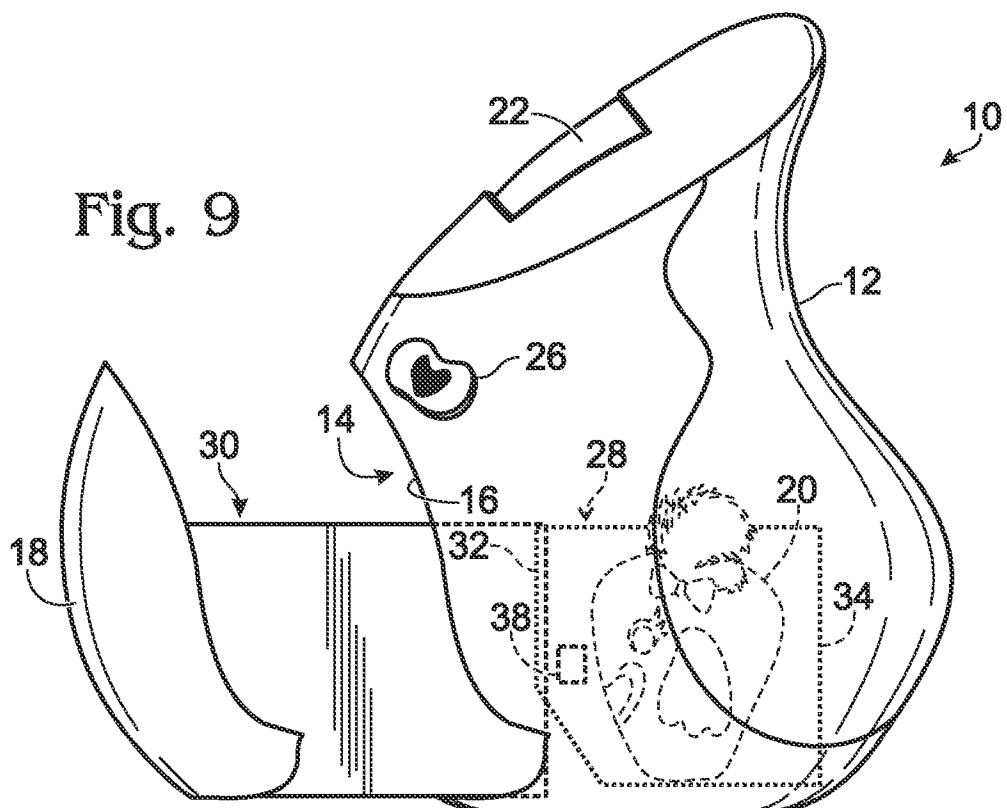


Fig. 9



5/5

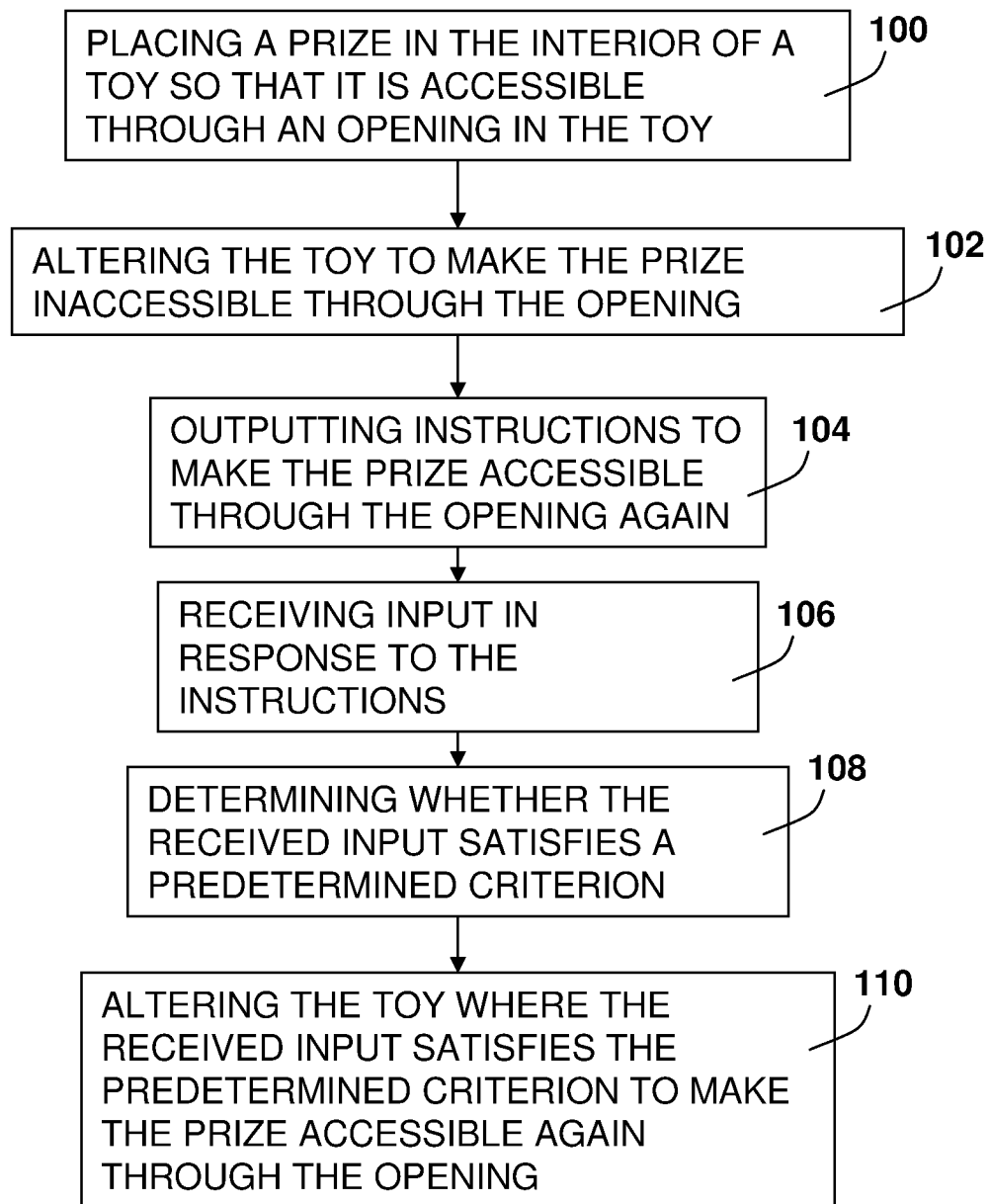


Fig. 10

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2009/054004

A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - A63H 11/00 (2009.01)

USPC - 446/330

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)

IPC(8) - A63H 11/00 (2009.01)

USPC - 446/330

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

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

PatBase

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6,702,644 B1 (HORNSBY et al) 09 March 2004 (09.03.2004) entire document	1-8,12-14, 20, 22-23
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Y		9-11,15-19, 21, 24-26
Y	US 2008/0081694 A1 (HONG et al) 03 April 2008 (03.04.2008) entire document	9-11, 24-26
Y	US 2003/0124953 A1 (HORNSBY et al) 03 July 2003 (03.07.2003) entire document	15-19, 21, 25-26

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Date of the actual completion of the international search

22 September 2009

Date of mailing of the international search report

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