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(54) **RECONFIGURABLE BRICK BUILDING SYSTEM AND STRUCTURE**

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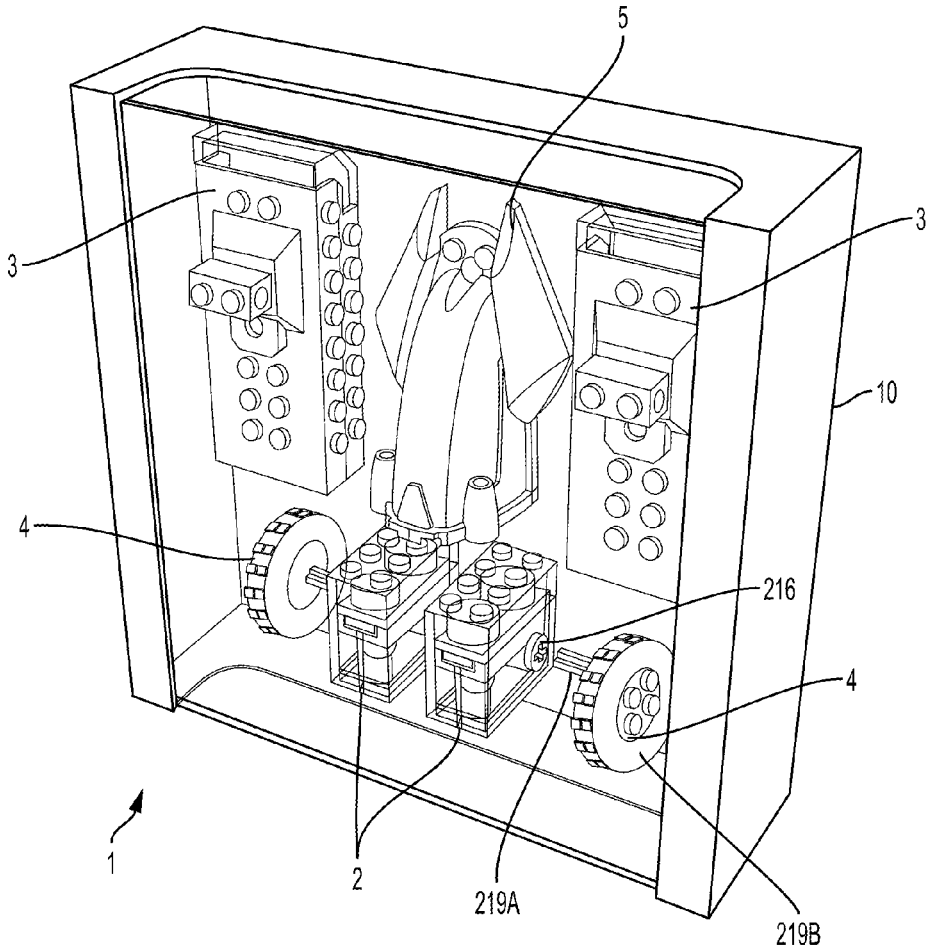
(52) **U.S. Cl.**
CPC *A63H 33/042* (2013.01)

(57) **ABSTRACT**

In one aspect, the embodiments discussed herein are directed to a building brick toy/system including a power brick with a power supply, a motor driven by the power supply, and a receiver coupled thereto; a universal connector with one or more surfaces having a series of mating connectors arranged at spaced intervals therealong configured to mate with corresponding mating connectors of the power brick so as to allow for a releasable connection between the universal connector and power brick; and a remote with a manipulatable control switch that can control the motor of the power brick. In addition, at least one driven element can also be coupled to the power brick so as to be driven in response to operation of the motor.



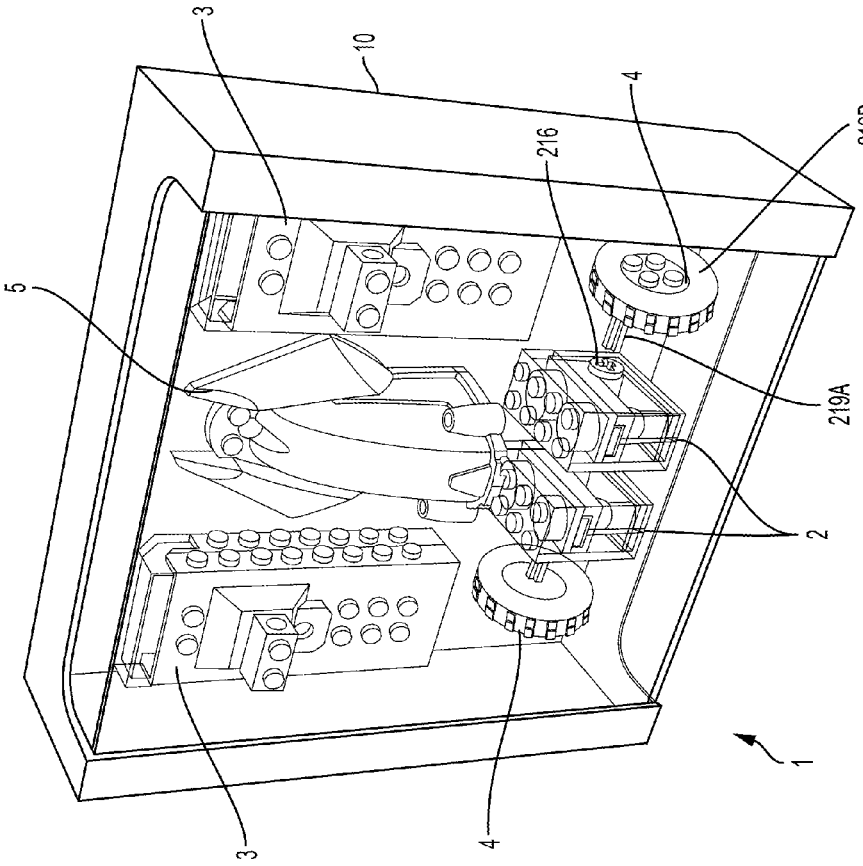


FIG. 1

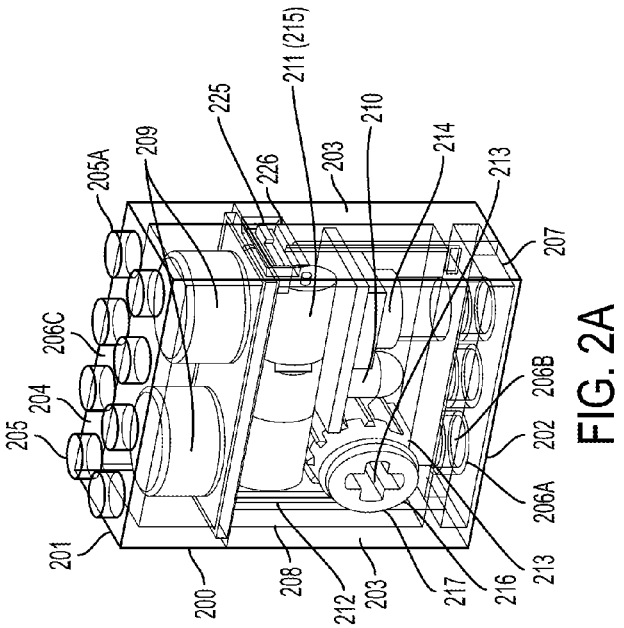

201
205
204
206C
205A
209
225
226
211 (215)
203
210
214
213
207
206B
202
206A
213
217
216
203
212
208
200

FIG. 2A

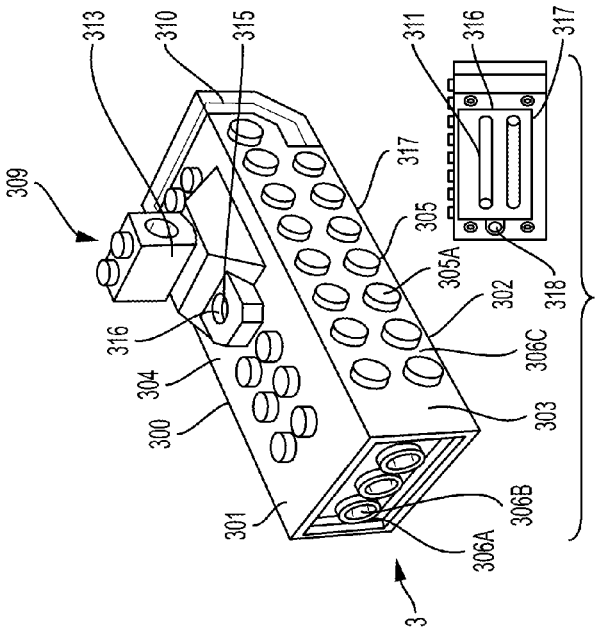

309
313
310
315
316
304
300
301
306A
306B
303
306C
302
305A
305
317
311
316
317
318
3

FIG. 2B

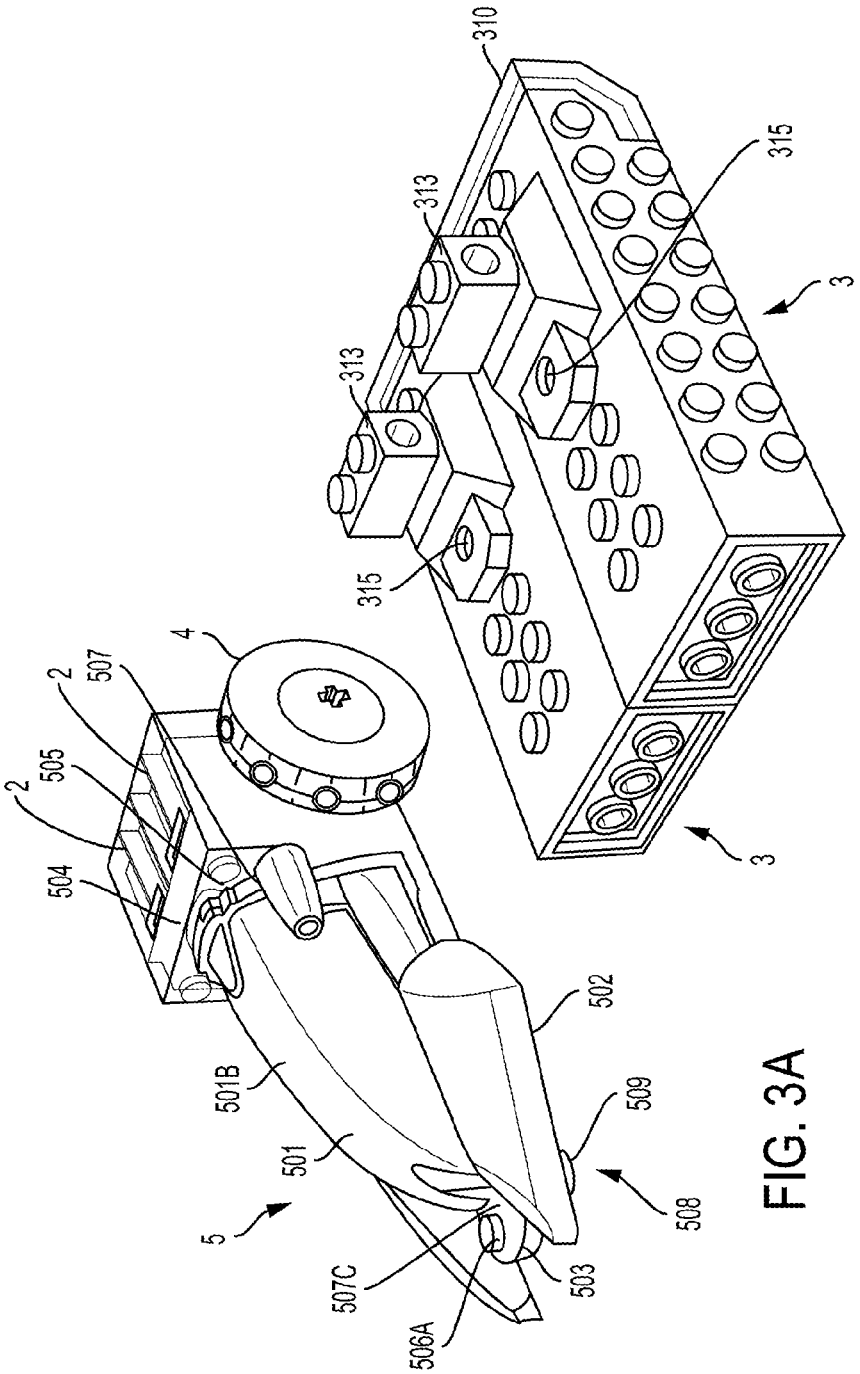

310
315
313
313
315
3
3
4
2
507
2
505
504
502
501B
501
509
5
508
507C
503
506A

FIG. 3A

FIG. 3B

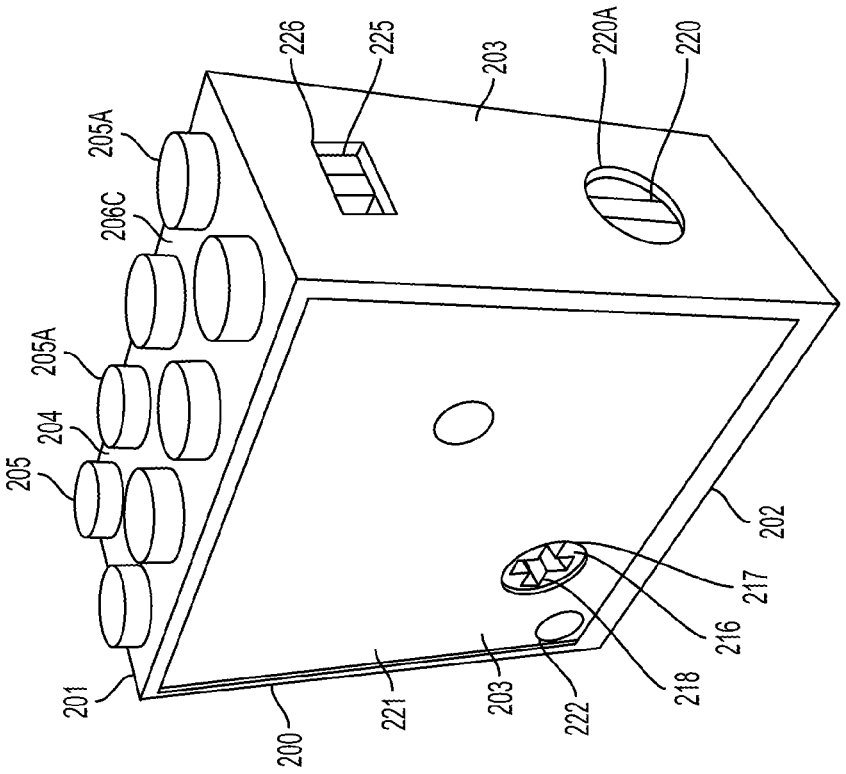

226
225
203
220A
220
205A
206C
205A
204
205
201
200
221
203
222
218
216
217
202

FIG. 4

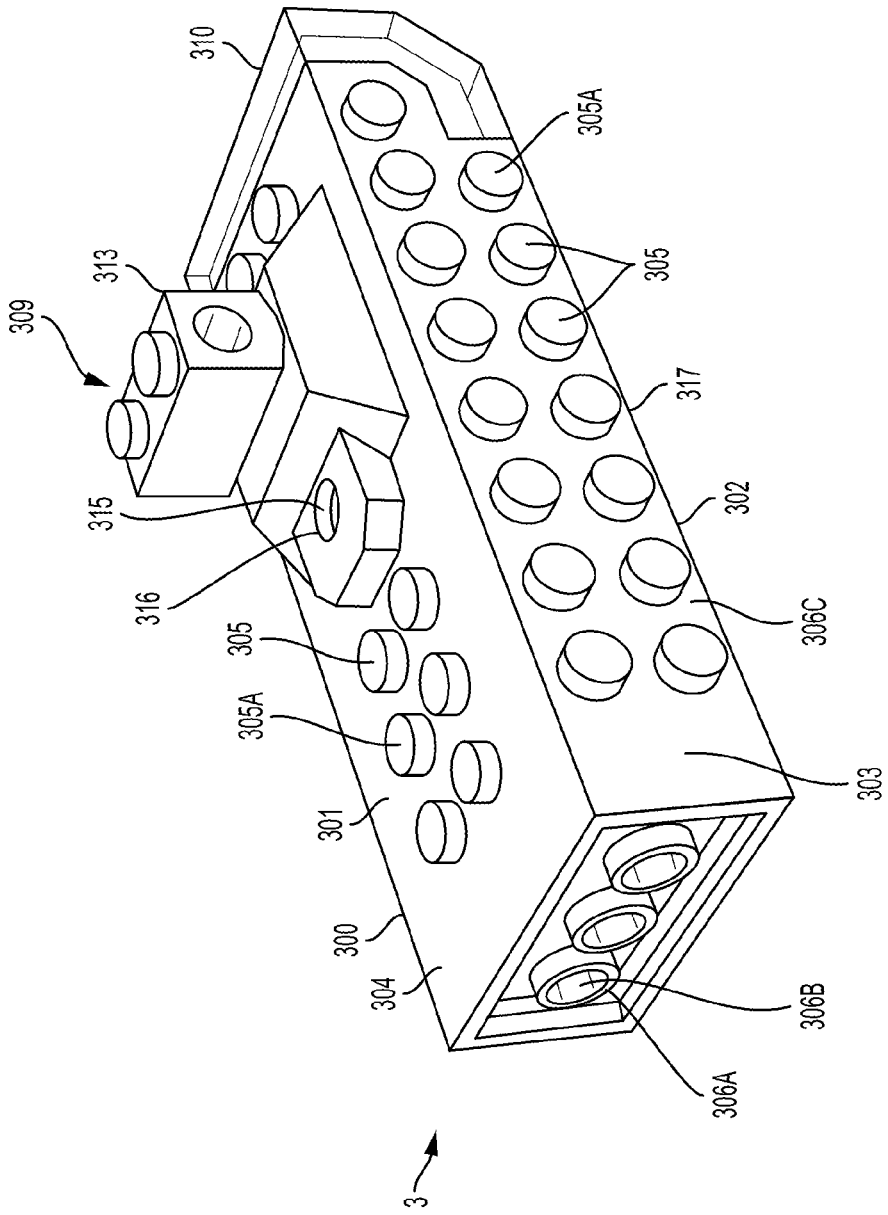

310
305A
313
305
309
317
315
302
316
306C
305
305A
303
301
300
304
306B
306A
3

FIG. 5

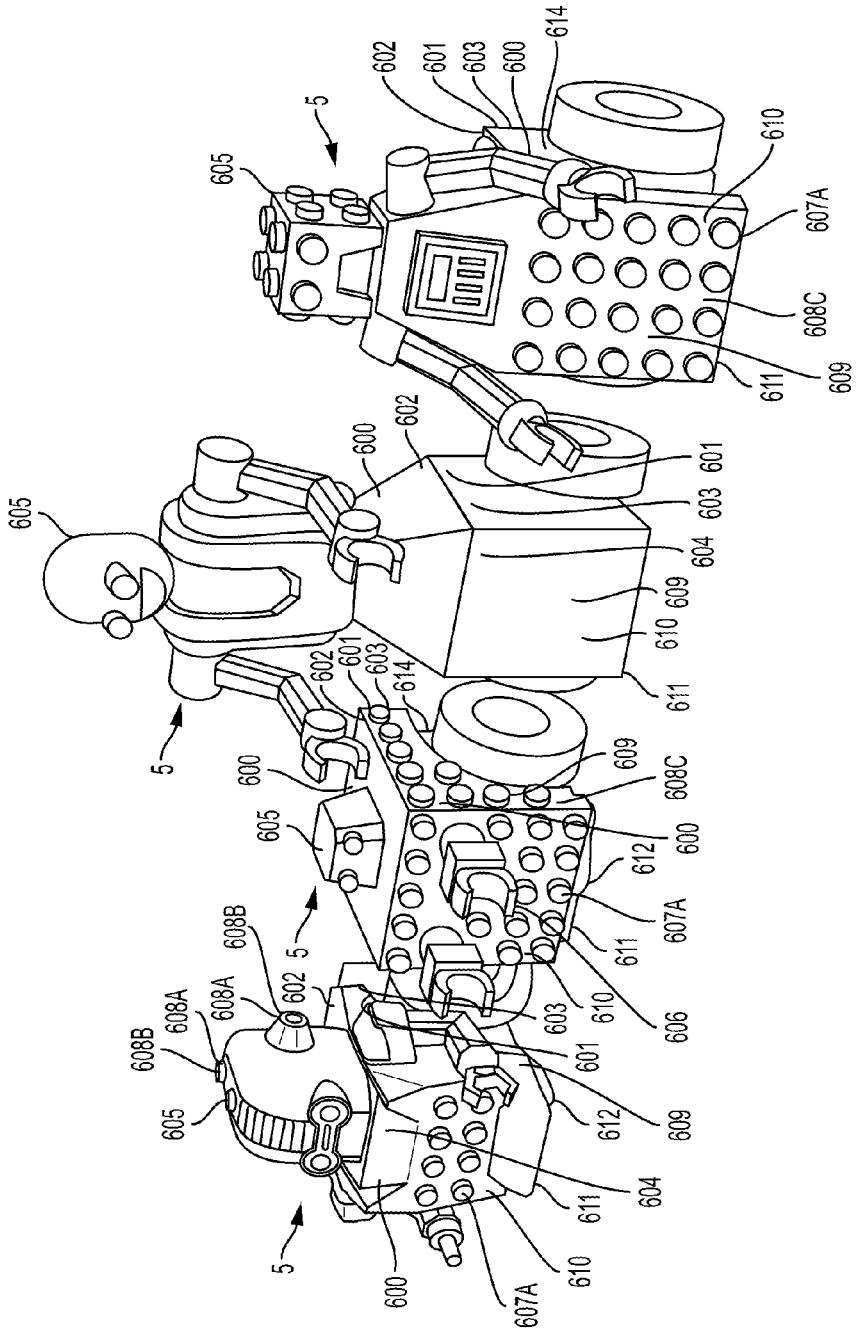

600
601
602
603
604
605
606
607A
608A
608B
608C
609
610
611
612
614
5

FIG. 6

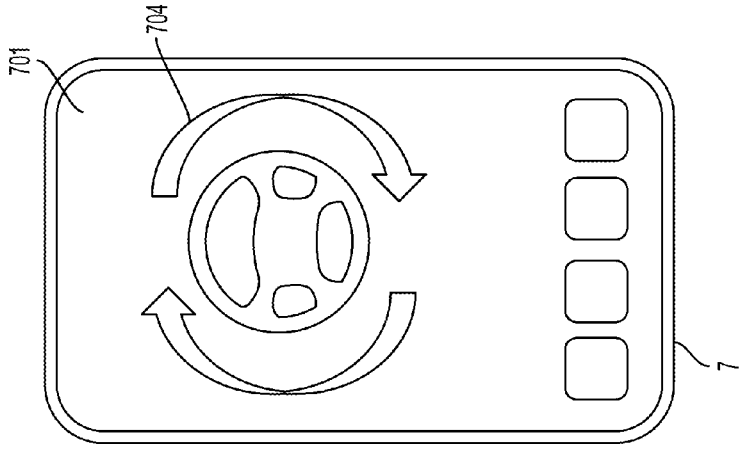


FIG. 7C

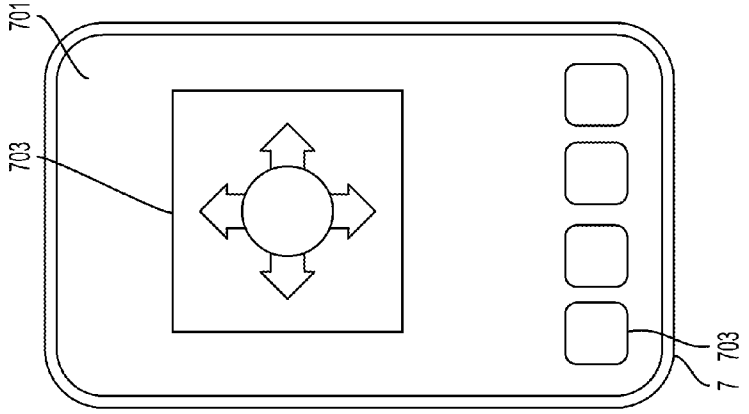


FIG. 7B

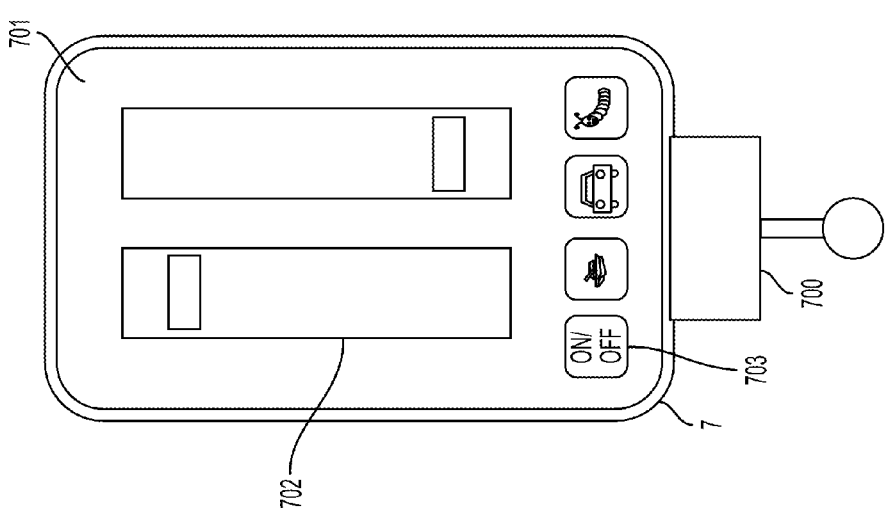


FIG. 7A

RECONFIGURABLE BRICK BUILDING SYSTEM AND STRUCTURE

CROSS REFERENCE TO RELATED APPLICATIONS

[0001] The present Patent Application is a formalization of previously filed, co-pending U.S. Provisional Patent Application Ser. No. 62/176,263, filed Feb. 12, 2015 by the inventors named in the present Application. This Patent Application claims the benefit of the filing date of this cited Provisional Patent Application according to the statutes and rules governing provisional patent applications, particularly 35 U.S.C. §119(e), and 37 C.F.R. §§1.78(a)(3) and 1.78(a)(4). The specification and drawings of the Provisional Patent Application referenced above are specifically incorporated herein by reference as if set forth in their entirety.

TECHNICAL FIELD

[0002] The present disclosure generally relates to games, puzzles and/or toys using inter-locking pieces. In particular, the embodiments discussed herein relate to a reconfigurable toy or system including a series of bricks, blocks or other pieces that are inter-connectable to form a variety of user configured structures, and which allow for controllable motion of such user configured structures.

BACKGROUND

[0003] Reconfigurable brick building systems, such as those sold under the trademarks LEGO®, K'NEX®, MEGA BLOCKS®, and/or KREO® have become very popular with children and adults. Similarly, remotely controlled, user designed vehicles such as cars, planes, etc., have also become increasingly popular. As such, a need exists for building systems that enable movement of user designed creations.

BRIEF DESCRIPTION OF THE DRAWINGS

[0004] The foregoing and/or other aspects and utilities of the present general inventive concept will become apparent and more readily appreciated from the following description of the embodiments, taken in conjunction with the accompanying drawings. For the purpose of illustration, forms of the present general inventive concept which are presently preferred are shown in the drawings; it being understood, however, that the general inventive concept is not limited to the precise arrangements and instrumentalities shown. In the drawings:

[0005] FIG. **1** is a perspective view of a user configurable brick building system according to one embodiment of the present disclosure.

[0006] FIG. **2**A shows a perspective view of a power brick according to an example embodiment.

[0007] FIG. **2**B shows a perspective view of a remote control module according to an embodiment of the present disclosure.

[0008] FIG. **3**A shows a perspective view of an embodiment of the user configurable remote controlled vehicle using the system of FIG. **1**, with two power bricks connected with a universal connector.

[0009] FIG. **3**B illustrates a remote control module according to an embodiment of the present disclosure, such as shown in FIG. **3**A.

[0010] FIG. **4** shows a perspective view of the power brick of the user configurable brick building system according to FIG. **1**.

[0011] FIG. **5** shows a perspective view of the remote of the user reconfigurable brick building system according to FIG. **1**.

[0012] FIG. **6** is a perspective view of the brick building system according to an additional embodiment of the present disclosure.

[0013] FIG. **7**A shows a further embodiment in which a mobile device, such as smartphone or tablet, is used to control the power bricks wherein a display image includes remotes.

[0014] FIG. **7**B shows another embodiment in which a smartphone or tablet is used to control the power bricks wherein a display image includes a joystick.

[0015] FIG. **7**C shows an embodiment in which a smartphone or tablet is used to control the power bricks wherein a display image includes a steering wheel.

DETAILED DESCRIPTION

[0016] According to embodiments of the present disclosure, a user configurable brick building system or toy **1** allowing for controllable motion of user designed/built brick based creations is provided. As illustrated in FIGS. **1**-**7**C, the building system **1** generally will include a series of interconnectable pieces, here shown as blocks or bricks, including one or more power bricks **2** and one or more remotes **3**. The building system **1** can further include a series of body pieces, including at least one universal connector **5** that can be configured to allow for the connection of multiple power bricks and/or other attachments, and one or more wheel assemblies **4** connectible to each power brick **2**. Each power brick **2** generally can be configured to receive a signal sent from a remote **3** to control a motor **215** or other actuator housed within the power brick **2** to enable user controllable motion of the user's brick based creations. As shown in FIG. **1**, the brick building system **1** can be sold in a kit **10**, having various different configurations of blocks, bricks and/or other types of connectable pieces, and further can engage and be connectable with other, known building block or connectable brick systems.

[0017] As illustrated in FIG. **2**A, each power brick **2** will typically include power brick body **200** that can be formed in various sizes and/or configurations. In the embodiment shown in FIG. **2**A, the power brick body **200** generally includes a top portion **201**, a bottom portion **202**, and side walls **203**. The power brick body **200** further can be made of plastic, composite, or other suitable materials. Additionally, the top portion **201**, bottom portion **202**, and/or side walls **203** generally can comprise a material that transmits infrared (IR), radio frequency (RF) or other types of wireless control signals at various wavelengths. For example, as shown in FIG. **2**A, at least the top portion **201** of the power brick body **200** is indicated as including a material capable of transmitting material an infrared signal.

[0018] The top portion **201**, bottom portion **202**, and side portions **203** of the power brick body **200** may, for example, have a substantially rectangular shape as generally indicated in FIGS. **1**-**4**. However, the top portion **201**, bottom portion **202**, and side portions **203** of the power brick body **200** are not limited to a rectangular shape, and may have any suitable shape, such as a square, circle, triangle. The top portion **201** may include a generally flat surface **204** with mating con-

nectors **205/206** disposed therealong, and the bottom portion **202** may include a generally flat surface **207** with mating connectors **205/206** disposed therealong. The mating connectors **205/206** can include male connectors **205**, shown in the present embodiment as formed as generally cylindrical protrusions **205**A; and female connectors **206**, including protrusions **206**A with recessed portions **206**B defined therein, as shown in FIG. **4**, or including spaces **206**C defined between protrusions **205**A. These mating connectors **205/206** can be configured to connect to existing building brick sets, such as those sold under the trademarks LEGO®, K'NEX®, MEGA BLOCKS®, and/or KREO®. Other mating or connectable element systems and/or devices also can be used. Additionally, one or more of the side portions **203** and/or bottom portion **202** of each power brick also can include mating connectors **205/206** for connection to other building bricks or blocks.

[0019] FIG. **2**A shows that a chamber **208** generally will be defined within the body **200** of each power brick **2**, and in which a power source **209**, a receiver **210**, and a driving mechanism **211**, can be received and housed. The power source **209**, which provides power to the various components of power brick **2**, including the receiver **210** and the driving mechanism **211**, can include rechargeable and/or replaceable batteries, such as LR44 button cell batteries, or any other suitable power source. In addition, the receiver **210**, which receives a signal from the remote **3** to operate the driving mechanism **211**, can be configured to receive an infrared (IR), radio frequency (RF), Bluetooth, and/or any other signal.

[0020] In one embodiment, the driving mechanism **211** can include a gear assembly **212** and an axle **213** configured to connect wheel assemblies **4** (FIG. **1**) to the power brick **2**, and an electric motor **215** (FIG. **2**A). The driving mechanism **211** further can include multiple motors, actuators and/or other driving mechanisms for providing motion to the resultant block based creations. The electric motor **215** generally will be connected to gear assembly **212** to supply power generated by the driving mechanism **211** to the axle **213**, in order to cause rotation of the axle **213** (FIG. **2**A). The gear assembly **212** can be configured to create sufficient torque to move various size brick building structures a user would like to put into motion. The driving mechanism **211** can further provide motion for different functions or operations of the power brick **2** other than just driving wheel assemblies and/or can drive various attachments connected to the power brick **2**. For example, the power bricks **2** can operate a spring loaded dart shooter, a catapult, gripper, and/or an up/down motion linear motor. Other actions, such as lights, horns, animal noises, etc., also can be powered by each power brick, including the provision of multiple different operations, such as where multiple power bricks are used.

[0021] As illustrated in FIGS. **1**, **2**A and **4**, the axle **213** can be connected to an exterior connector **216**, which is provided in an aperture **217** defined in a surface of one of the side portions **203**. This exterior connector **216** can be a male or female connector used to attach wheels, pulleys, and/or any other moving parts attached to the power brick **2**. For example, the external connector **216** can be a female plus connector **218** that is configured to be connected to wheel assemblies **4** (FIG. **3**A), which may include a tire **219**A attached to the wheel, and a plus shaped axle **219**B attached to the wheel (FIG. **1**). However, the external connector **216** can be a male plus connector or any other suitable connector to connect to brick building attachments. Accordingly, when the axle **213** is driven by the motor **215**, through the gear assembly **212**, the axle **213** will rotate the attached external connector **216** and any moving parts attached thereto, e.g., the wheel assemblies **4**.

[0022] As further illustrated in FIGS. **2**A and **4**, a setting switch **220** can be provided in an aperture **220**A defined in the body **200** of each power brick **2**, for example, in one of the side portions **203**. The setting switch **220** can be configured to receive a tool, such as a screw driver, a coin, or other implement so that the channel setting can be changed by turning the setting switch **220** between a series of settings. The setting switch **220** can also be configured to receive screw drivers, wrenches, or other tools of other shapes, such as a phillips or hex shape. The setting switch **220** can also include a button, knob, or other suitable mechanism for changing between different channels. A channel setting encoder **214** can be provided to detect the relative position of the switch **220** to set the selected, appropriate control transmission channel. The receiver **210** of the power brick **2** can be configured to receive signals on multiple channels. For example, in one embodiment, the setting switch **220** can be settable to four or more different channel or selection positions, such as A, B, C, and D channels.

[0023] In addition, the side portions **203** of the power brick body **200** can each have flat surface **221**, with a fastener aperture **222** defined in at least one of the side portions to allow a user to remove the side portion **203** to open the internal chamber **208** and enable access to the internal components of the power brick **2** (FIG. **4**). The user can thus change batteries or other components of the power brick **2** as needed. This removable side portion **203** also can be connected to the power brick body **200** using a hinge or tab and slot assembly.

[0024] Each power brick **2** can also include a power switch **225** that turns the power brick **2** on and off (FIGS. **2**A and **4**). The switch **225** can have multiple positions so as to enable the user to change the rotational direction of the motor **215** in addition to turning it on and off. FIGS. **2**A and **2**B further show that switch **225** can be disposed in a slot **226** defined in a surface of one of the side portions **203**.

[0025] FIGS. **3**A-**3**B show that two or more power bricks **2** can be connected together in a modular manner such as by using mating connectors. Thus, a series of multiple power bricks **2** can be connected together in a variety of user definable configurations using different bricks and/or various brick building systems. In one embodiment, two or more power bricks **2** can be connected together by a universal connector **5** (FIG. **3**A). This universal connector **5** can be further be used as a balancing piece for the two or more power bricks **2**, and the universal connector **5** can have a connector body **500/600** that can include a number of different shapes or body types (FIGS. **3**A and **6**). In one embodiment, the universal connector body **500** can take the shape of a car or other vehicle (FIGS. **1** and **3**A), and in an alternative embodiment (FIG. **6**), the universal connector body **600** can take the shape of a robot (FIG. **6**). However, the universal connector **5** is not limited to these shapes and may take any shape a user may select or design, including various building structures created by the user using different bricks from various brick building systems.

[0026] In one example embodiment, the body of the universal connector **500** includes a top portion **501** (shown with a cockpit **501**B), a bottom portion **502**, a front portion **503**, and a rear portion **504**, generally shown in FIG. **3**A. The rear portion **504** can have a surface **505** with mating connectors **506**/**507** disposed thereon, which mating connectors **506**/**507** can connect to the mating connectors **205**/**206** of one or more power bricks **2**, to thus link or connect multiple power bricks **2** together (FIG. **3**A). The mating connectors **506**/**507** can include male connectors **506** and female connectors **507**. The male connectors **506** can include cylindrical or other protrusions **506**A, and the female connectors **507** may include protrusions **507**A with recessed portions **507**B defined therein, or alternatively may be defined by spaces **507**C defined between protrusions **506**A. These mating connectors **506**/**507** can be configured to connect to existing building brick sets, such as those sold under the trademarks LEGO®, K'NEX®, MEGA BLOCKS®, and/or KREO®.

[0027] The bottom portion **502** of the universal connector **5** also may have a protruding portion **508** including a protruding stud **509** that can ride on the ground to provide stability to the two power bricks **2**, and when the two power bricks **2** are connected to a wheel assembly **4**, define a tricycle type vehicle, as shown in FIG. **3**A. Although the protruding portion **508** is shown as a stud **509** in this embodiment, the protruding portion **508** is not limited to a stud and may include a wheel, skid, or any other mechanism to provide stability to two or more power bricks **2** connected together.

[0028] In alternative embodiments, as shown in FIG. **6**, the body **5** of the universal connector **600** can be formed in other configurations, such as in the shape of a robot having a base portion **601** with a top portion **602**, a bottom portion **603**, and side portions **604**. The top portion **602** will typically extend in upward direction from the base portion **601**, and can further include a head portion **605** and arm portions **606**. The body portions can include mating connectors **607**/**608** connectors so that various blocks, bricks or other attachments can be connected to the body **600**. The mating connectors **607**/**608** can include male connectors **607** and female connectors **608**. For example, male connectors **607** can include cylindrical or other protrusions **607**A, while female connectors **608** may include protrusions **608**A with recessed portions **608**B defined therein, or may be defined by spaces **608**C defined between protrusions **607**A. Mating connectors **607**/**608** can be configured to connect to existing building brick sets, such as those under the trademarks LEGO®, K'NEX®, MEGA BLOCKS®, and/or KREO®.

[0029] FIG. **6** additionally shows that the bottom portions **603** of the universal connector body **600** may include mating connectors **607**/**608** connectors that can be connected to the connectors of one or more power bricks **2**, allowing multiple power bricks **2** to be connected together, and/or to other building bricks. Additionally, the universal connector body **600** can have extension portions **609** that extend in the downward direction from the side portions **604** so as to as least partially cover the side portions **203** of one or more power bricks **2** connected to the universal connector body **600**. These extension portions **609** can have a flat surface **610** with mating connectors **607**/**608** disposed thereon, allowing for the connection of various brick based attachments to the extension portions **609**, and the extension portions **609** can include a bottom portion **611** with a protruding portion **612** disposed thereon, which further may include a protruding skid, stud or similar part **613** (FIG. **6**). The body **600** also can include recessed areas **614** along sides thereof such that when wheel assemblies **4** are connected to the power bricks, the wheels can be located closer to a center line of the body **600**, with its head portion **605** supported in an upright arrangement.

[0030] A power brick **2** can further be used to move components or appendages of the universal connector body **600**, such as the head portion **605** and the arm portions **606**, and/or other parts or appendages such as legs, eyes, etc. By way of example, a power brick **2** with a driving mechanism including a motor can be used to rotate the head portion **605** about an axis, and/or a power brick **2** with a driving mechanism including an actuator can be used to move the arm portions **606** in an up/down direction.

[0031] According to embodiments of the present disclosure, the system **1** will also include one or more remote control modules or remotes **3**. For example, each remote **3** will include a remote body **300** that can be foamed in various configurations and can generally be made of plastic, composite, or other suitable materials, including a material that transmits IR, RF, Bluetooth®, or other signals, which the remote body **300** will generally include a top portion **301**, a bottom portion **302**, and side portions **303** (FIGS. **2**B and **5**). The top portion **301**, bottom portion **302**, and side portions **303** of the remote **3** are shown with a substantially rectangular shape. However, the top portion **301**, bottom portion **302**, and side portions **303** are not limited to a rectangular shape and may have any suitable shape. Further, the top, bottom and side portions each may include a generally flat surface **304** with mating connectors **305**/**306** disposed thereon. The mating connectors **305**/**306** can include male connectors **305** and female connectors **306**. The male connectors **305** can include cylindrical protrusions **305**A, and the female connectors **306** may include protrusions **306**A with recessed portions **306**B defined therein. Also, female connectors **306** may include spaces **306**C defined between protrusions **305**A. These mating connectors **305**/**306** connectors can be configured to connect to existing building brick sets, such as those under the trademarks LEGO®, K'NEX®, MEGA BLOCKS®, and/or KREO®.

[0032] Additionally, as shown in FIG. **2**B, the remote **3** generally includes a control mechanism **309**, a transmitter **310**, and a power source **311**. The control mechanism **309** can be disposed on the upper surface **304** of the top portion **301** of the remote body **300**, and can include a control lever **313**. The control mechanism **309** is not, however, limited to control lever **313**, and can also include a wheel, joystick, or any other mechanism suitable to control the driving mechanism of a paired power brick **2**. The remote **3** also may include a transmitter **310** that can transmit an infrared (IR), radio frequency (RF), Bluetooth®, and/or any other wireless control signal. When a user engages the control mechanism **309**, the transmitter transmits a signal that is received by the receiver **210** of the power brick **2** linked to the remote, enabling a user to control the driving mechanism of the power brick. For example, when a user moves the control lever **313** in the forward direction, the motor of the power brick is rotated in one direction, (e.g., forward). Conversely, when the user pushes the control lever in the backward direction, the motor will be rotated in the opposite direction (e.g., in reverse).

[0033] As further illustrated in FIG. **2**B, the remote **3** can include a setting switch **315** that allows a user to change the channel of the transmitter **310**. The setting switch **315** can be disposed in an aperture **316** provided along the top portion **301** of the remote body and can be toggled between different setting positions corresponding to different channels transmitted by the transmitter. For example, the setting switch **315** can include four different channels, A, B, C, and D, that match the channels of the power bricks. FIG. **5** shows that the setting switch **315** can be configured to receive a flat head screw driver, coin, or other implement so that the channel setting can be changed by rotating the setting switch **315**, although the setting switch **315** also can be configured to receive other screw drivers, wrenches, or tools of other shapes, such as a phillips or hex shape. The setting switch **315** also can be a button, knob, or other suitable mechanism for toggling between different channels.

[0034] Multiple control channels, for example, **4** channels, can be available for the wireless control system of the brick building system. Each power brick can have an A, B, C, D setting switch as well as a power switch that turns the power brick on and sets the base rotation of the motor (either clockwise or counterclockwise), and each remote also can have the same A, B, C, D channel settings for transmission. In the case of multiple remotes and multiple power bricks, one example of configurations that can be controlled includes one-to-one pairing of one power brick and one remote by setting them to the same channel, with each remote controlling an individual power brick. In an additional example, one-to-many pairing of multiple power bricks, such as by setting multiple motors to the same channel and using one remote set to that channel may be achieved. In this case, one remote can simultaneously control multiple power-bricks, and each power brick in this configuration does not necessarily need to turn the same way, since each power brick can be selectively set with its default rotation either clockwise or counterclockwise. Therefore, the user can engage the control stick on the remote and have the drive axles a group of power bricks start turning, with all turning the same direction or with some turning the opposite direction. For example, when the user reverses the control stick, the motion of the power bricks can reverse from their previous rotation.

[0035] The bottom portion **302** of the remote body also can have a removable portion **317** (FIG.

[0036] **2**B) covering an aperture or chamber **316** which receives a power source **311** of the remote. This removable portion **317** can be connected to the remote body **300** using a hinge or tab and slot assembly, or by using screws **318** or other suitable fasteners. The power source will supply power to the various components of the remote **3**, and may include one or more AAA batteries or other suitable power source.

[0037] The mating connectors **305**/**306** can further allow for two or more remotes **3** to be connected together. For example, two remotes **3** can be positioned side to side such that their control levers **313** are parallel to each other (FIG. **3**B). Alternatively, one remote **3** can be disposed such that it is rotated at a 90° angle from a second remote **3** to create a system of two control levers in which one of the control levers can be moved in forward/backward directions and the control lever can be moved in the right/left direction. With the mating connectors **305**/**306** arranged therealong, an unlimited number of remotes **3** can be attached together in this manner.

[0038] According to embodiments of this disclosure, one-to-one pairing of one power brick **2**

[0039] (FIG. **2**A) and one remote **3** (FIG. **2**B) can be achieved by setting the setting switch **315** of the remote **3** and the setting switch **220** (FIG. **2**A) of the power brick **2** to the same channel, e.g., channel A if an IR signal is used. In this regard, a single remote **3** can be paired to and thus control an individual power brick **2**. In addition, a single remote **3** can be paired to multiple power bricks **2** by setting the switches **220** of the multiple power bricks **2** to the same channel as the setting switch **315** of the remote **3**. A single remote **3** can thus simultaneously control the motors **215** of multiple power bricks **2**. Moreover, because a user can use switch **225** to change the default rotation of the motors of the power brick **2** to either clockwise or counterclockwise, the motor of each power brick **2** in this configuration does not have to be rotated in the same direction. Therefore, a user can push the control lever (or levers) on the remote **3** in the forward direction and the motors of multiple power bricks **2** can be engaged so as to all turn in the same direction, or with some turning in one direction and others turning in an opposite direction, such as in response to engagement of different control levers. Conversely, when a user pushes the control lever on the remote **3** in the backward or opposite direction, the motors can rotate in the direction opposite to their previous rotation state.

[0040] In an additional embodiment, as illustrated in FIGS. **7**A-**7**C, an application can be used to control the power brick **2**, or other attachments, with a smartphone or tablet **7**. Bluetooth® and/or another integrated frequency can be used to control one or more power bricks **2**. For example, a dongle **700** can be provided to be plugged into the smartphone or tablet **7** to control a power brick **2** that receives IR or other non-integrated frequencies, or the Bluetooth® capability of the device can directly control the linked power bricks. The application may include a control display **701** in which a control image **702**, icons **703** for activating sensors or placing the power bricks **2** into various modes, and other images can be displayed. The control image **702** may include an image of the remote **3** and control lever allowing a user to control the motor by sliding their finger in the forward/backward direction over the control lever image (FIG. **7**A). However, the control image **702** is not limited to an image of the remote **3** and may include any other image suitable for controlling the functions of the power brick, including a joystick **703** (FIG. **7**B) or steering wheel image **704** (FIG. **7**C). The control image may further include a grid type arrangement in which a grid contains a plurality of portions or icons that correspond to power bricks **2** on particular channels, and the functions of the different power bricks **2**, such as controlling the motor, can be executed by pressing one of the portions or icons in the grid. The control display **701** may further include icons **703** selectable to place each of a series of power bricks in various modes of operation. For example, these modes of operation may include turning various power bricks **2** on and off in different sequences so that different brick based creations incorporating the power bricks **2** can achieve complex motion patterns, such as mimicking the motion of a snake, centipede, or other complex motion. The modes of operation can further include mimicking a vehicle, such as a **2** wheel or **4** wheel drive car or a tank, to control these types of brick based creations.

[0041] In an additional embodiment, the power brick **2**, or a separate brick configured to be attached to the power brick **2**, can include one or more sensor assemblies. One of these sensors may include a bump sensor assembly. In this embodiment, a power brick **2**, or separate attachment/connected brick, can include a bump sensor, a button or switch, and a transmitter that transmits a signal, such as IR, RF, Bluetooth®, or other signal. The bump sensor may be a momentary bump sensor which activates only when the bump sensor is engaged, or this bump sensor can be a continuous bump sensor that stay engaged until pressed again. For example, when the button or switch is triggered, the transmitter can transmit a continuous signal causing the motor of the power brick **2** rotate in one direction. Then, when the bump sensor is engaged, the transmitter can transmit a continuous signal that causes the motor of the power brick **2** rotate in the opposite direction. The bump sensor can be further used to trigger another function of the power brick, or a separate attachment thereto. This function may include playing a continuous sound, turning on a light, activating a spring loaded dart shooter or catapult and/or any other function. In general, the bump sensor can be engaged when it senses a force or impact.

[0042] For example, a user can combine two or more power bricks **2**, two or more wheel assemblies **4**, and one or more universal connectors **5** to create a car arrangement. Further, a bump sensor configuration can be attached to one of the power bricks **2** or otherwise provided to the car. If the car runs or bumps into a another car, wall, or other obstacle, the bump sensor can be engaged so that a signal is sent that causes the motor(s) of the power brick(s) to rotate in the opposite direction, thus causing the car to move in the rearward or opposite direction, such as for a programmed or selected time or until another obstacle is engaged. In this regard, the car with the power bricks can operate without a user controlling the remote, and the remote can be used to operate other features of the assembly, for example, the remote **3** can be used to control head and arm portions of a robot body.

[0043] Additionally, the bump sensor can be connected to one or more lights and/or a display, such as LEDs connected to the power bricks, universal connector and/or remotes, a display screen in the application shown in FIGS. **7**A-**7**C, and/or other suitable lights or displays, and each time the bump sensor is triggered, one of the lights and/or the display lights up. For example, one or more power bricks **2**, or an attachment brick, with the bump sensor assembly can further include one or more lights or display. Using this configuration with two or more of the car arrangement discussed above, users can have a "battle" or "demolition derby" in which the object is to engage another user's car arrangement's bump sensor. In this regard, with the bump sensor connected to lights or a display, the number of times a car arrangement's bump sensor has been engaged can be tallied by lighting up one of the lights and/or by displaying a number on the display.

[0044] In an alternative embodiment, with another sensor assembly, the power brick, or a separate attachment brick, can include a speaker that plays various sounds, such as a horn, buzzer, beeping, animal roars or growls, or other sounds. Sounds can further be controlled by a separate sensor such as the bump sensor, such that when the bump sensor is engaged the speaker may play various sounds. Alternatively, the remote can be used to cause the speaker to play various sounds. For example, when a user pushes the control lever of the remote in the forward direction, one sound is played, and when the user pushes the control lever of the remote in the backward or opposite direction, a different sound is played.

[0045] Other sensor assemblies can also be provided. These may include a light sensor assembly in which light greater than ambient light can cause the power brick to turn on/off or perform various functions; a tilt sensor assembly in which a tilt sensor senses whether the power brick is turn upside down or on its side and the power brick is caused to perform various functions when the tilt sensor is triggered, such as apply a mechanism to turn the power brick right side up; and/or a timer assembly in which the power brick performs different functions when a timer goes on and off.

[0046] The foregoing description of the disclosure illustrates and describes various embodiments. As various changes could be made in the above construction without departing from the scope of the disclosure, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense. Furthermore, this disclosure covers various modifications, combinations, alterations, etc., of the above-described embodiments, as well as various other combinations, modifications, and environments, which are within the scope of the disclosure as expressed herein, commensurate with the above teachings, and/or within the skill or knowledge of the relevant art. Furthermore, certain features and characteristics of each embodiment may be selectively interchanged and applied to other illustrated and non-illustrated embodiments of the disclosure.

[0047] It will be understood by those skilled in the art that while the present invention has been discussed above with respect to particular embodiments of the present invention, various additions, modifications and/or changes can be made thereto without departing from the spirit and scope of the invention.

What is claimed is:

1. A building brick toy, comprising:

a power brick comprising a body having one or more surfaces with a series of connectors arranged at spaced intervals therealong and configured for interlocking with corresponding mating connectors; the body of the power brick defining a chamber configured to at least partially house a power supply, a motor driven by the power supply, and a receiver;

a universal connector including a body having one or more surfaces with a series of mating connectors arranged at spaced intervals therealong and configured to mate with the mating connectors of the power brick so as to releasably connect the universal connector and power brick; and

a remote having a manipulatable control switch for controlling the motor of the power brick, the remote comprising a transmitter that sends one or more control signals to be received by the receiver of the power brick upon manipulation of the control switch,

wherein at least one driven element is coupled to the power brick so as to be driven in response to operation of the motor of the power brick.

2. The building brick toy of claim **1**, wherein the at least one driven element comprises at least one wheel.

3. The building brick toy of claim **1**, wherein the universal connector comprises a vehicle body and the at least one

driven element comprises wheels driven by the motor, and wherein the motor is reversible for driving the wheels in forward and reverse directions.

4. The building brick toy of claim **1**, wherein the universal connector comprises a robot body, and the at least one driven element comprises movable arms, legs, a head, wheels, or combinations thereof.

5. The building brick toy of claim **1**, wherein the remote is a first remote, and wherein the brick building toy further comprises:

a second remote having a manipulatable control switch; and

at least one additional power brick including a body defining a cavity with an actuator at least partially housed therein, wherein the body of the at least one additional power brick has one or more surfaces with a series of mating connectors arranged at spaced intervals therealong, and wherein the manipulatable control switch of the second remote is movable to control the motor of the power brick and/or the actuator of the at least one additional power brick.

6. The building brick toy of claim **5**, wherein the second remote comprises a body having one or more surfaces with a series of mating connectors arranged at spaced intervals therealong, and wherein the series of mating connectors of the body of the second remote are configured to engage with a series of mating connectors arranged along one or more surfaces of a body of the first remote to allow for reconfigurable, detachable coupling of the first and second remotes.

7. The building brick toy of claim **1**, wherein the remote comprises a control application configured to be loaded onto a user's mobile device, the control application including a control screen accessible on a display of the mobile device, the control screen comprising at least one control image responsive to the user's touch to control operation of the motor of the power brick and a series of icons selectable to place the power brick into various modes, activate one or more sensors attached to the power brick, display additional images, or combinations thereof.

8. The building brick toy of claim **7**, wherein the mobile device includes a mobile phone or tablet.

9. The building brick toy of claim **1**, wherein the power brick further comprises a bump sensor attached thereto, and activation of the bump sensor changes a direction of rotation of the motor in response thereto.

10. The building brick toy of claim **9**, further comprising a series of lights arranged along the power brick, universal connector, and/or remote, wherein activation of the bump sensor illuminates one or more of the series of lights.

11. A motorized, remotely controllable reconfigurable brick building system, comprising:

a series of power bricks each including a body coupled to a motor that drives at least one movable feature and a receiver in communication with the motor, wherein the body of each power brick comprises one or more surfaces having a series of matable connectors disposed at spaced intervals therealong;

at least one additional body with a surface including a series of connectors disposed at spaced intervals therealong, the connectors of the at least one additional body configured to matably engage with the connectors of at least one of the power bricks to allow for removable connection of the power bricks to the at least one additional body; and

a remote control including a transmitter or transceiver configured to transmit a control signal to the receiver of at least one of the series of power bricks to control the motors of the power bricks, wherein the motors of the power bricks allow for controlled movement of the at least one additional body and/or attachments thereto.

12. The reconfigurable brick building system of claim **11**, wherein the at least one movable feature includes one or more wheels.

13. The reconfigurable brick building system of claim **11**, wherein the at least one additional body comprises a universal connector brick configured for connecting multiple ones of the series of power bricks together so as to provide a user a controllable vehicle.

14. The reconfigurable brick building system of claim **13**, wherein the universal connector brick comprises a protrusion disposed on a bottom surface thereof configured to provide stability to the multiple ones of the series of power bricks.

15. The reconfigurable brick building system of claim **11**, wherein the at least one additional body comprises a universal connector having a robot body with one or more movable appendages, wherein the motor of one of the series of power bricks initiates movement in at least one of the one or more movable appendages.

16. The reconfigurable building brick system of claim **13**, wherein the remote control comprises a series of remote control blocks each having a body with a control switch disposed thereon, wherein the control switches of the remote control blocks are manipulatable to control the motors of the multiple ones of the series of power bricks so as to drive the controllable vehicle.

17. The reconfigurable building brick system of claim **6**, wherein the bodies of the series of remote control blocks each have a series of mating connectors disposed at spaced intervals therealong configured for removable connection of the series of remote control blocks together in multiple arrangements.

18. The reconfigurable building brick system of claim **11**, wherein each of the power bricks includes a bump sensor and a series of lights attached thereto, wherein engagement of the bump sensor illuminates one or more of the series of lights.

19. The reconfigurable building brick system of claim **11**, wherein each of the power bricks includes a bump sensor attached thereto, and engagement of the bump sensor activates, stops and/or changes rotation of the motors of the power bricks.

20. The reconfigurable building brick system of claim **11**, wherein the remote control comprises a control program downloadable to a user's mobile device, wherein the control program displays a control screen on a display of the user's mobile device, the control screen comprising a control image selectable to control the motors of the series of power bricks and wherein the control image comprises a series of remote controls, a joy stick, a wheel, or combinations thereof.

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