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(54) Title of the Invention: **Gaming apparatus**
Abstract Title: **A game control apparatus**

(57) A game control apparatus for controlling computer game play that comprises: a floor standing rocking exercise frame having a base portion with a rocker section, the base portion of the frame being adapted to pass around behind a user from their left to right hand sides, the frame having an upstanding portion with hand hold that a user may grip to rock the frame and having a dock 8 that demountably holds in use a motion-sensing unit 11 of an external games system whereby the apparatus may control one or more aspects of game play on the games system by the sensing of motion by the motion-sensing unit. The motion-sensing unit is connected to an electronic interface in the frame, integrating the external motion sensing unit with the game controls of the frame. Optionally a battery compartment 14, or extra controls may be included in the frame.

FIG 3A

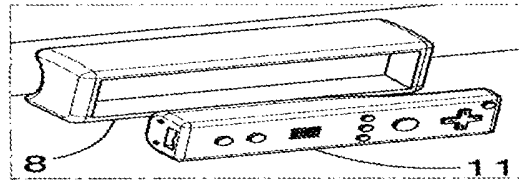
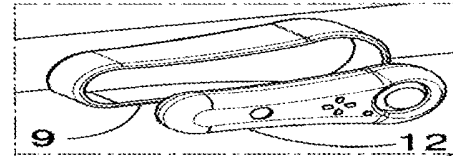


FIG 3B



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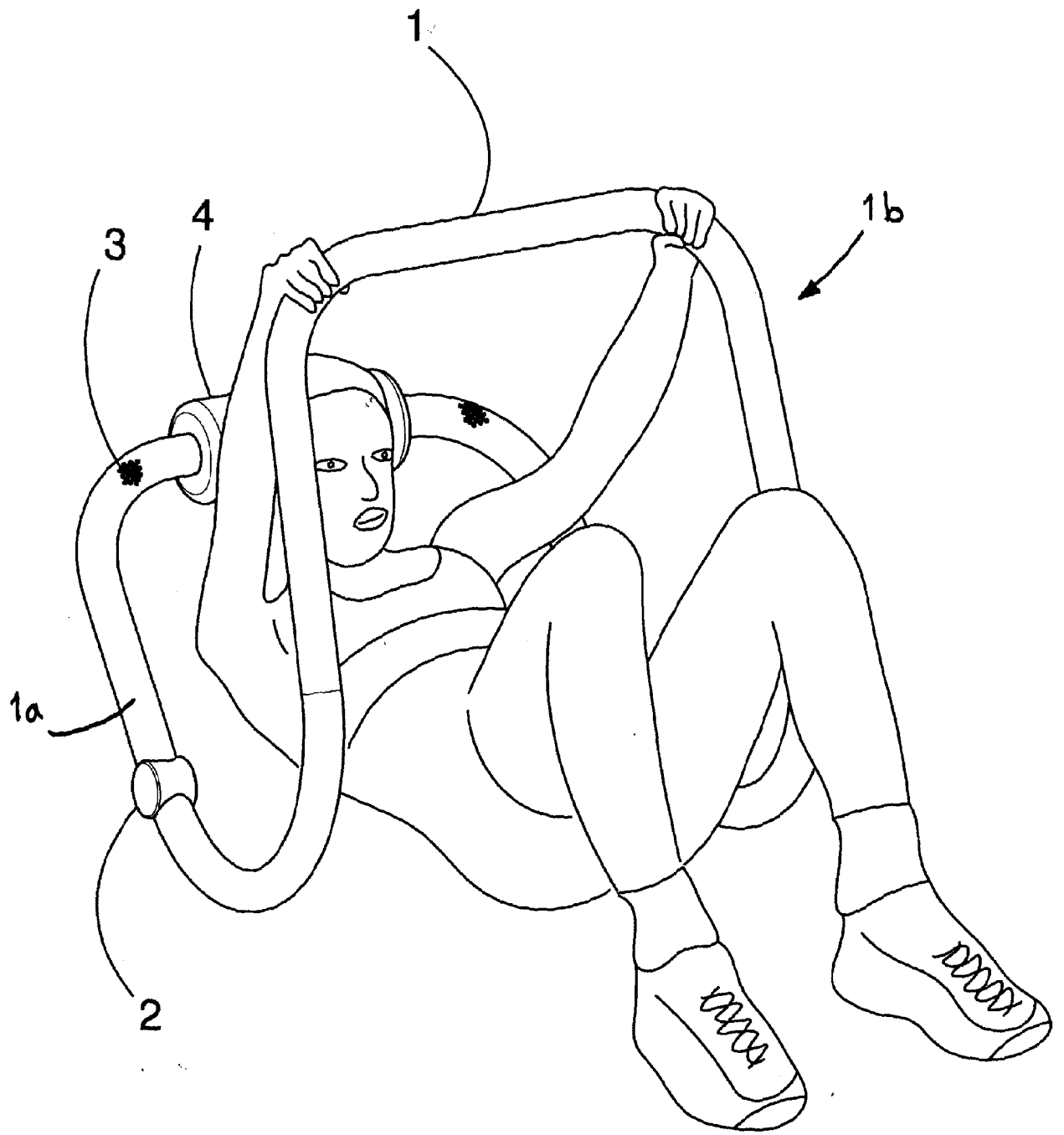


FIG 1

FIG 2A

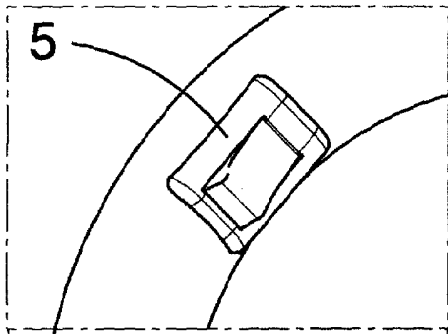


FIG 2B

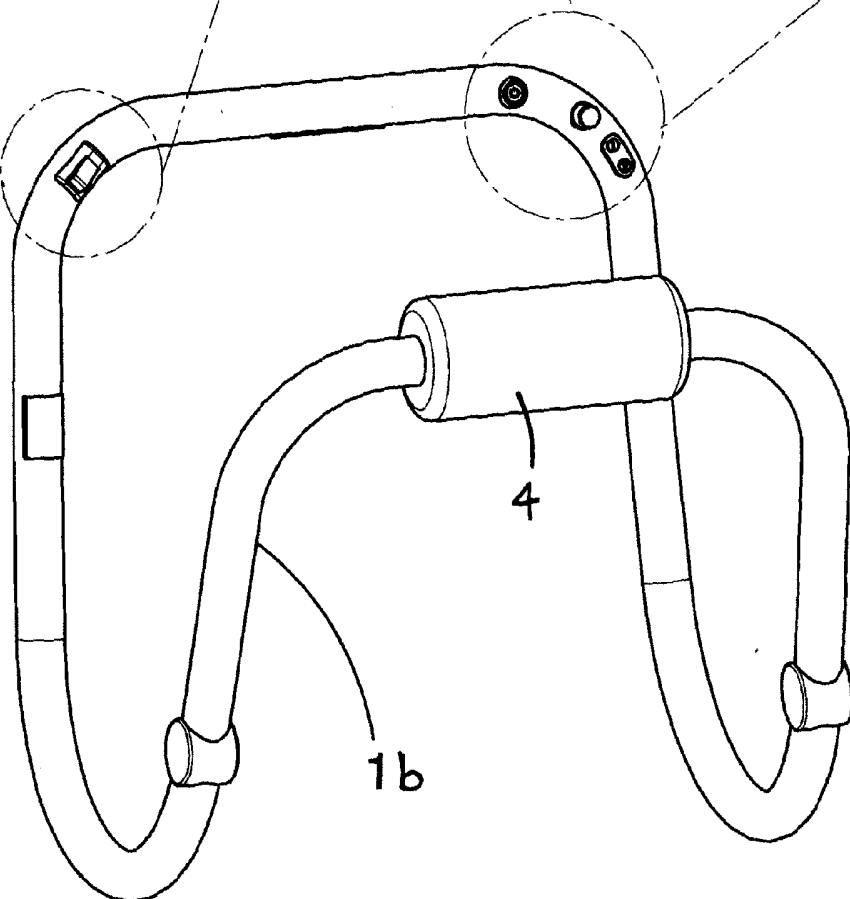
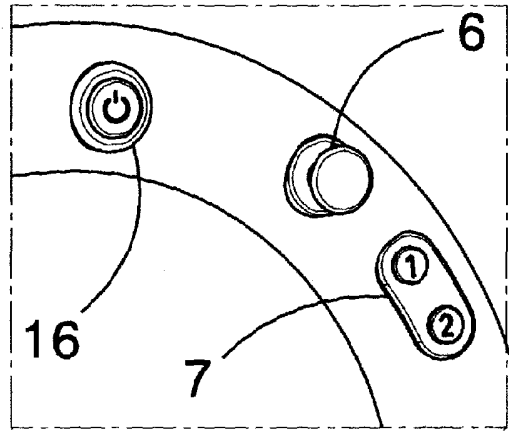


FIG 2

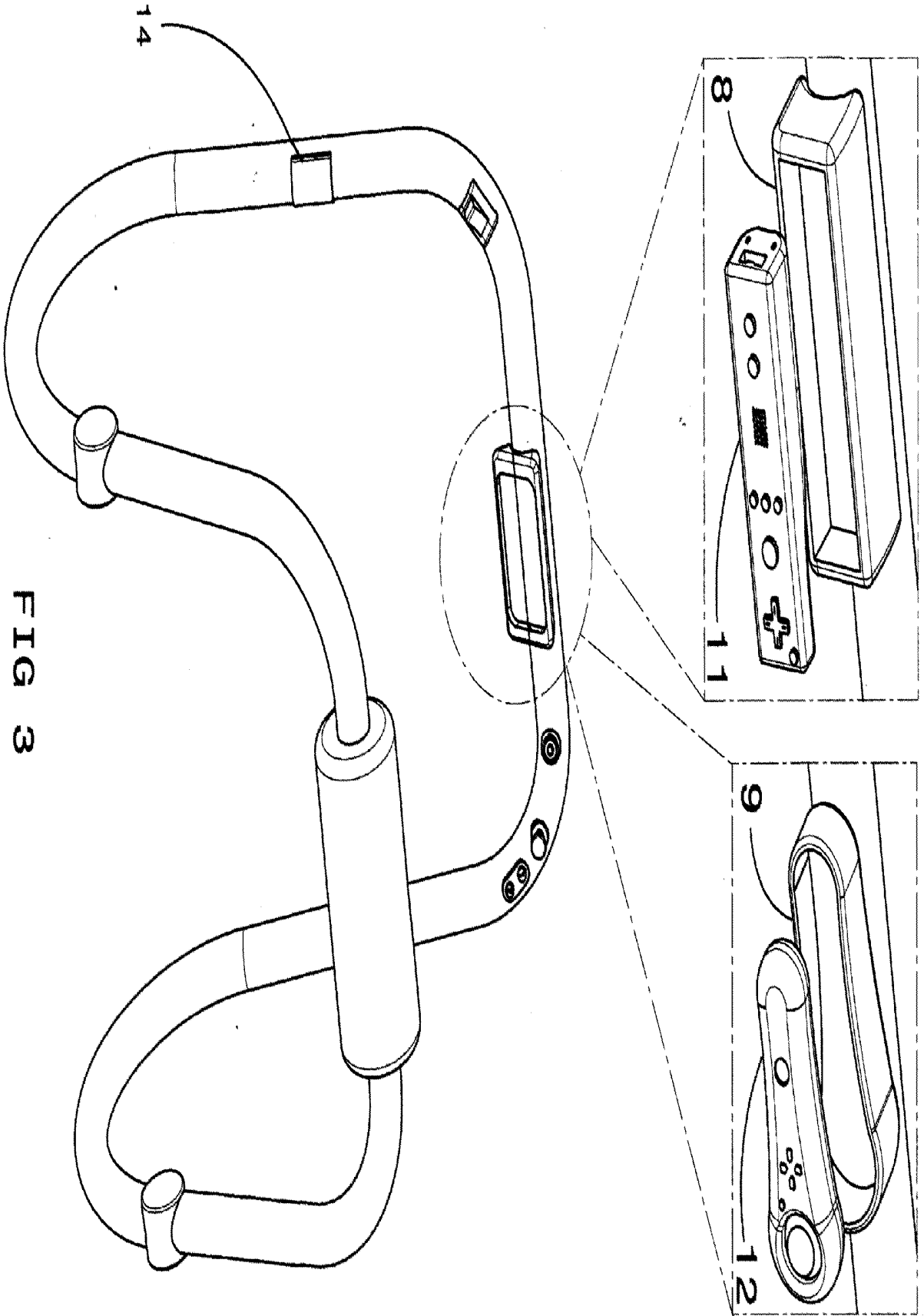


FIG 4A

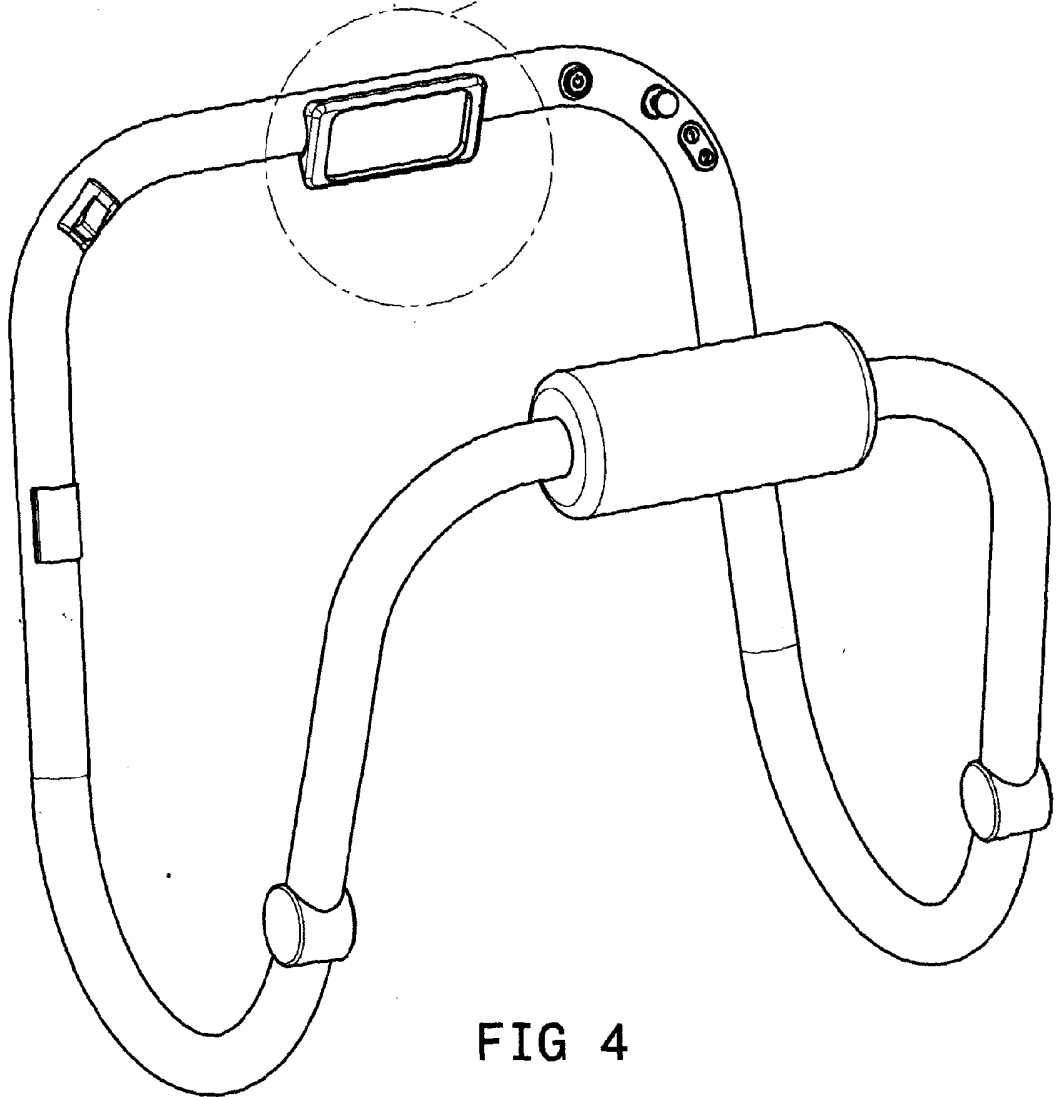
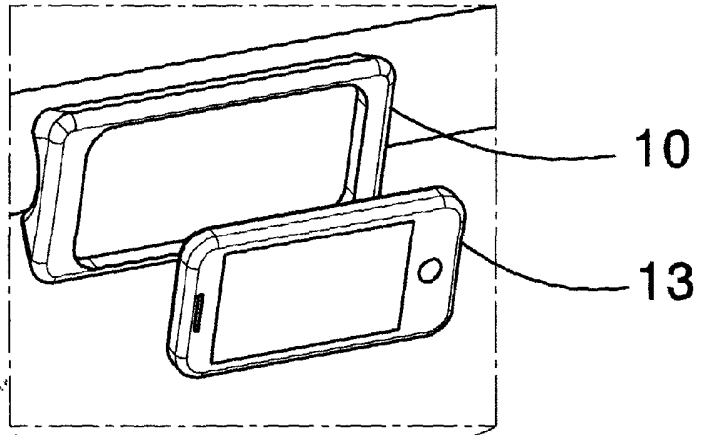


FIG 4

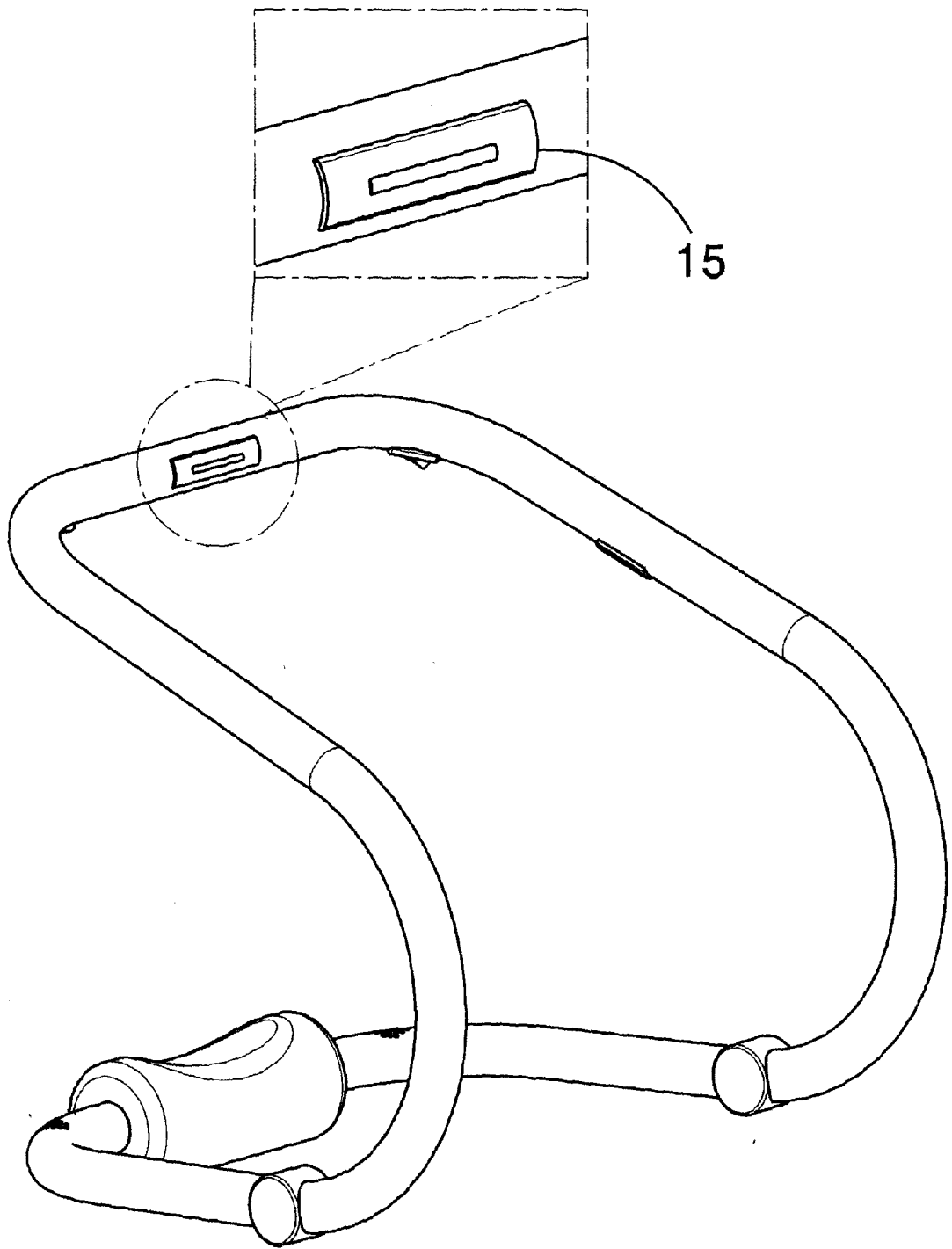


FIG 5

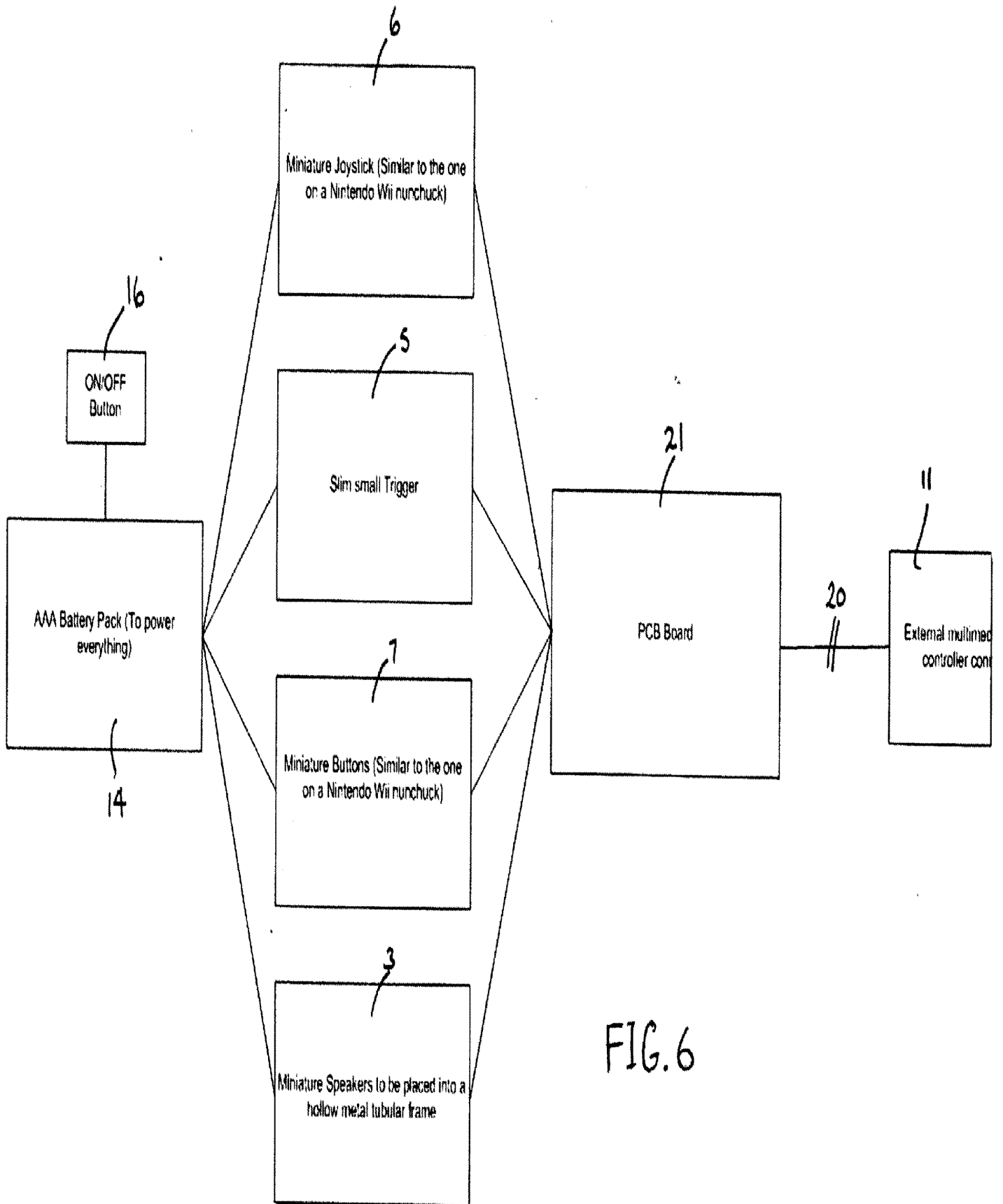


FIG. 6

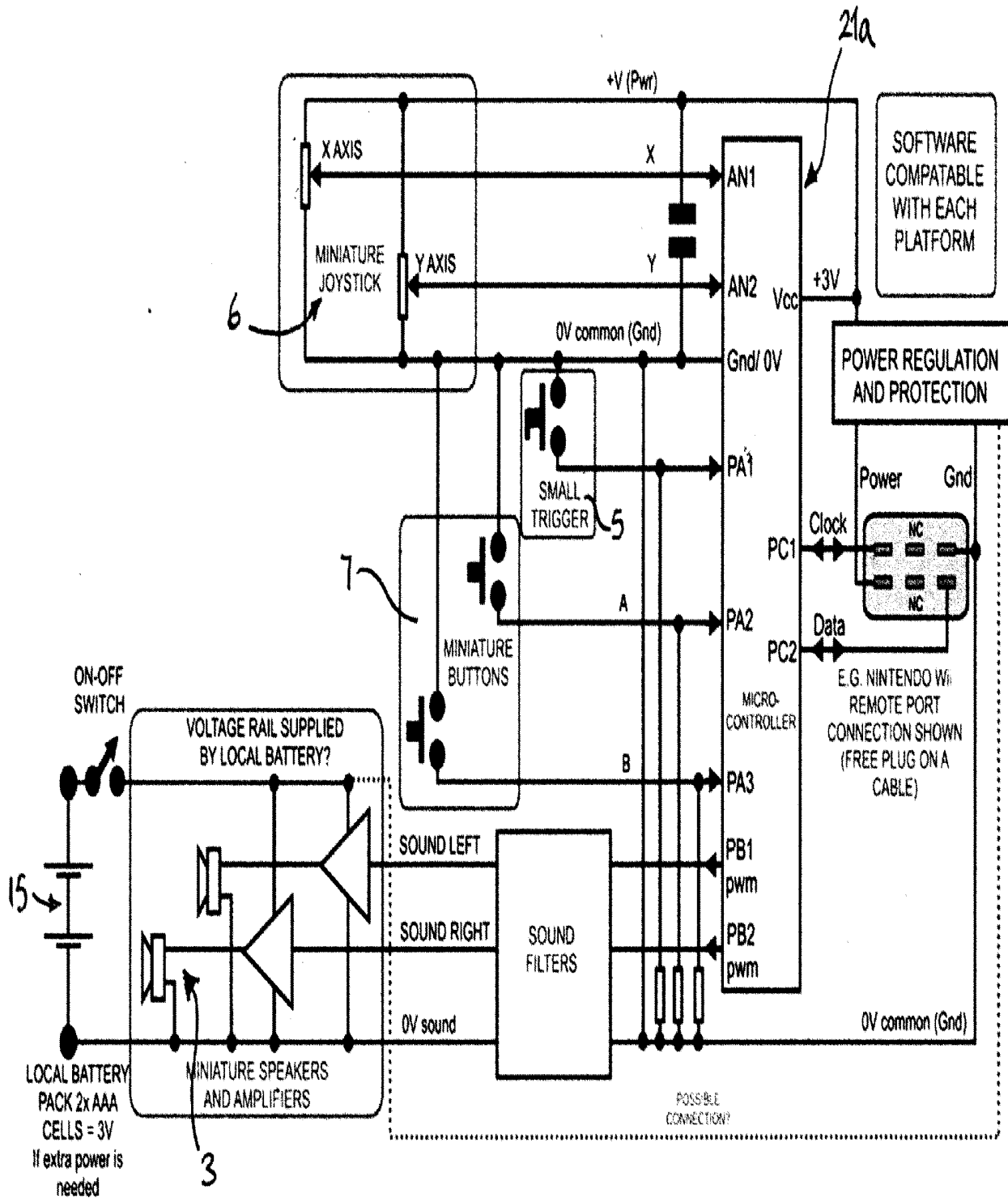


FIG 7

Gaming Apparatus

Field of the Invention

The present invention concerns game control apparatus for controlling computer game play and further concerns exercise equipment.

5 **Background to the Invention**

As human society in the UK, USA and other developed countries becomes ever-more dependent upon computers for both business and leisure purposes we have become increasingly sedentary in our life-styles and there is understandably a high level of scientific and political concern over
10 the diminishing role of physical activity in our lives. The current rising obesity epidemic is in part attributable to poor dietary habits but also to the collapsing levels of physical activity across our society as a whole, with particularly worrying extremes in the younger generation. Amongst children presently of school age the proportion of their day spent in sport,
15 physical play or other physical activities is on average a fraction of that had by their parents. Television, internet usage and computer games take up the major part of many teenagers or pre-teens home lives and traditionally entail being seated/ slouching for hours at a time with only the fore-arm and hand of the child experiencing any exercise as it depresses
20 the keys of a keyboard or keys/ buttons or joystick of a game control pad or the like.

Partly in response to this major social problem, but primarily to inject a new level of fun into game-play, a number of games manufacturer's have sought to bring greater bodily physical activity to computer game-play and
25 introduced game control hardware and software that can exercise more than just the player's fore-arm and hand. A high profile example of this is the much-praised Nintendo Wii^(R) and its Wii-fit^(R) software and balance-board peripherals that encourage owners to practice a range of exercises

in a fun games console-interactive manner. The basic Wii^(R) system comprises a console and a hand held remote unit in the shape of an elongate wand/ pointing device. The remote incorporates IR sensors at the tip to pick up infrared beams from an IR emitter array of the console so
5 that the remotes position in 3D space can be determined relative to the console and the remote further has built-in accelerometers responsive to the motion of the user's hand carrying the remote. An auxiliary remote known as 'Nunchuk' may also be used with the Wii^(R) remote to provide conventional button-type games triggers. The basic Wii^(R) system gives the
10 user a potentially greater range of motion than traditional games systems, allowing the user to partially mimic the motions in golf, tennis et cetera and thus can provide a better level of exercise. The Wii Fit^(R) add-on package extends the exercise value of the system somewhat by incorporating an auxiliary pressure-sensitive mat for the user to stand on while performing a
15 number of simple exercises. The Wii Fit^(R) system allows for a number of simple exercises but is not well suited to exercising the core/ abdominal region of the body.

Others have proposed apparatus for bodily computer games interaction to encourage exercise and/or to provide ever-more immersive virtual reality
20 type game control experiences. There are a substantial number of earlier patents and patent applications for game controllers built into large static gym equipment such as StairmastersTM, bench presses and running machines and complex suspended cradles, stands and games chair structures that allow the user to move their whole body while seated,
25 standing or hanging. These include, amongst others, PCT WO 2007089078 (Jun-Sun Park), US 7, 335, 134 (Richard Lavelle), US 200582632 (Robert James-Herbert) and PCT WO 9813107 (Hans Jurgen-Kramer). In general these systems are very bulky and expensive and best-suited to gyms or arcades and certainly not suited to wide-spread
30 domestic ownership in a way that might address the general health issues discussed above.

Thus on the one hand the known prior art includes popular home gaming systems such as the Wii-fit^(R) system with its motion-sensitive hand held remote unit and pressure-sensitive mat and on the other hand there are proposals for expensive complex seat or suspended cradle or other static gym equipment structures for exercising or providing immersive virtual reality type game control experiences. There still remains a need for a relatively low-cost solution that provides a higher level of physical activity and core body exercise value than the current Wii-fit^(R) system yet avoiding the bulk, cost and complexity of the various systems described in the patent proposals to date.

Summary of the Invention

According to a first aspect of the present invention there is provided a game control apparatus for controlling computer game play that comprises: a floor-standing rocking exercise frame having a base portion with a rocker section, the base portion of the frame being adapted to pass around behind a user from their left to right hand sides, the frame having an upstanding portion with hand hold that a user may grip to rock the frame and having a dock that de-mountably holds in use a motion-sensing unit of an external games system whereby the apparatus may control one or more aspects of game play on the games system by the sensing of motion by the motion-sensing unit.

The dock is a socket/ receptacle that is suitably of a size, shape and form adapted to securely accommodate the motion-sensing unit in use so that it will remain securely in place while exercising and yet allowing the unit to be demounted with ease after use. The dock may have a latch at the front rim of the socket to releasably hold the motion-sensing unit or may simply have a reasonably tight friction fit rim and/ or inner-wall to the socket to prevent the unit from dropping out or being dislodged by the rocking motion.

- The motion sensing unit may, for example, comprise the remote unit of a Wii^(R) system, thus enabling the apparatus of the present invention to very simply and cost-effectively extend the capabilities of a games console system that is already owned in many homes in the UK and US. The frame
5 may be further adapted with a dock to also hold a Wii^(R) system Nunchuk^(TM) or other conventional gaming remote compatible with the gaming system with selection (or variable function) control buttons/ joy-stick and/ or trigger. and presenting that remote with the controls facing towards the user lying in the frame.
- 10 However, the frame particularly preferably has built into it one or more game control switches such as, for example, selection (or variable function) control buttons, a joy-stick and/ or trigger and which is/ are linked to the dock for the motion-sensing unit, the dock incorporating an electrical connector to communicate uni-directionally or bi-directionally with the
15 motion-sensing unit. The frame further incorporates a unique electronic interface means (circuit/processor) that enables effective communication and co-ordination of control of game-play between the controller of the frame and the controller of the motion-sensing unit of the external games system. This enables the control signals of the frame's game control
20 switches and EMR sensor array to be combined with the motion-sensing signals from the docked motion-sensing unit and, for console-based systems such as the Wii and PS3, the output control signals to be transmitted (by wire or normally wirelessly) by the motion-sensing unit to the console.
- 25 The electronic interface means in the preferred embodiment comprises a custom made PCB board and processor chip which acts as the core of the system, powered by a battery pack or other power supply, the electrical connector (connecting to the motion-sensing unit), trigger, joystick, directional control buttons and speakers all connecting and synchronising/
30 co-ordinating with the external games system via the PCB board.

A battery may be built into the frame to power the game control features or the frame may be coupled to a mains power supply (preferably through a transformer or circuit breaker or other safety protector. Particularly preferably an energy harvesting facility may be built into the frame to capture ambient light energy (eg by solar cells) or other energy. Preferably the apparatus may capture kinetic energy from rocking of the frame, having a magnet and a coil that move relative to each other as the frame rocks.

In a preferred embodiment the frame further comprises an Electromagnetic Radiation (EMR) sensor array that is preferably positioned to face towards the console of the external games system in use. This suitably corresponds to an EMR emitter array of the external games system. In the case that the external system is a Wii^(R) system, the sensor array is an IR sensor array equivalent to the array on the Wii^(R) remote/ wand. This replaces the functioning of the IR sensor array on the Wii^(R) remote/ wand when the latter is fitted to the dock in case in that location the sensor array on the Wii^(R) remote/ wand is not able to function.

Preferably the upstanding portion of the frame is arched, having a spanning portion that extends from the user's left to right hand sides and which incorporates at least one of: i) the dock; and (where present) ii) the game control switch(es) ; and (where present) iii) the EMR sensor array.

Thus suitably at the top of the frame is the spanning portion/ handlebar incorporating an adaptable input port (the dock with connector) to hold and connect to an external gaming controller/ remote unit. The dock with connector suitably faces towards the user and is substantially centred across the width of the frame. The sensor array on the spanning portion/ handlebar suitably is also substantially centred across the width of the frame but faces in the opposite direction, away from the user and towards an emitter array (usually in the console of the external games system).

Preferably the frame incorporates a head-rest, suitably padded, in the part of the base portion that passes behind the user. This aids comfort and also improves the user's posture for viewing the screen of the gaming system.

In the preferred embodiment the frame may further incorporate a speaker, or a pair of speakers that are respectively to the left and right of the user in use.

The rocking frame apparatus allows the user to perform rocking exercises that are a type of controlled "sit-up" or "ab-crunch" that will through regular use dramatically improve the user's core body strength and overall fitness. The apparatus allows the user to carry out such exercise while interactively using the exercise as part of game-play.

The apparatus is far more compact and cost-effective than the complex prior art systems. Furthermore the concept of incorporating motion-sensing game control functionality into such rocking frame apparatus is far from obvious, not least since the natural posture for use of such types of equipment is supine (lying flat on back or lying on side) for a substantial part of the time. We have found, however, that the user's posture and movement within the configuration of the apparatus works surprisingly well and, furthermore, the wrap-around nature of the simple tubular metal frame provide good compensation for any inconvenience, offering the merits of a cockpit-like structure but without the bulk or cost of a games chair or a cockpit-style cabin.

The apparatus is widely compatible with a variety of provider's motion-sensing gaming platforms, such as that under development by Microsoft, the Apple iPhone^(R) and iTouch^(R) as well as the Nintendo Wii^(R). The dock may be designed to fit a particular system's remote unit or may be adjustable to fit different system's units, as required.

In summary, the apparatus is an inexpensive practical exercise machine which enables the user to lie flat on the floor, either on their side or back, securing all back/oblique and neck muscles whilst tilting forwards and backwards using the apparatus to exercise the key region of the core abdominal/oblique muscles while at the same time playing a variety of digital games. Such games may be generic and simply use the rocking motion as a trigger or may be created and customised to thematically tie in with virtual actions that involve exercising the abdominal region of the body. The user is further able to use the functionality of a joystick, trigger and buttons on the frame to enhance the game-play experience. The motion-sensitive interactive gaming functionality may be achieved inexpensively without need to hardwire such functionality into the apparatus.

15

Brief Description of the Drawings

A preferred embodiment of the present invention will now be more particularly described by way of example with reference to the accompanying drawings, wherein:

- 20 **FIG. 1** is a perspective view of the apparatus from one side with the base of the frame standing on the ground and showing a user in situ, lying supine with head resting on the headrest part of the frame and gripping the handle bar while facing towards the handlebar and towards a screen of a gaming system;
- 25 **FIG. 2** is a perspective view of the apparatus from below (but excluding the remote unit dock for convenience) and **FIG. 2A** is an inset view detailing a trigger switch on the handlebar while **FIG. 2B** is an inset view detailing a power ON/OFF button, a joystick and selection (or variable function) control buttons on the handlebar;
- 30 **FIG. 3** is a further perspective view of the apparatus from below but showing the remote unit dock and **FIG. 3A** is an inset view detailing the

dock on the handlebar as configured to receive and hold a Wii^(R) remote/wand, while **FIG. 3B** is an inset view detailing the dock on the handlebar instead configured to receive and hold the forthcoming PS3 motion sensor remote;

- 5 **FIG. 4** is a further perspective view of the apparatus from below showing the remote unit dock for an Apple iPhone^(R) or iPod touch^(R) and **FIG. 4A** is an inset view detailing the dock ;

FIG. 5 is a further perspective view of the apparatus from above, similar to Figure 1 but showing the EMR sensor array;

- 10 **FIG. 6** is a block diagram of the connections of the electronic elements of the apparatus; and

FIG. 7 is a more detailed electronic circuit diagram of the apparatus.

Description of the Preferred Embodiment

- Referring firstly to Figure 1, the apparatus comprises a floor-standing
15 rocking exercise frame 1 having a base portion 1a and an arched upstanding portion 1b. The base portion 1a lies on the floor when the frame 1 as a whole is at rest while the upstanding portion 1b is upright when the frame is at rest.

- 20 The base portion 1a of the frame 1 is adapted to pass around behind the user from the user's left to right hand sides while the arched upstanding portion 1b pass over the user from the user's left to right hand sides. The whole frame 1 takes the form of a continuous loop of tubing that is folded over, being bent so that it has an approximately C-shaped profile as
25 viewed side-on. The bend serves a rocker section between the base portion 1a and arched upstanding portion 1b to allow the frame 1 to be rocked back and forth. The part of the base portion 1a of the frame 1 that is adapted to pass around behind the user is provided with a thick

headrest cushion 4 that may comprise thick elastomeric foam outer tubing that is itself covered with a hard wearing outer membrane.

Where the loop of the frame 1 defines an arched upstanding portion 1b most of the upper part of the upstanding portion 1b of the frame 1 including most of the portion that spans over the user's body is suitably ensheathed and protected by an elastomeric foam outer tubing with a hard wearing outer membrane similar to the headrest but less thick provide comfortable hand grip positions. Here a user may grip the frame 1 as shown in Figure 1, to rock the frame 1 back and forth while raising and lowering their torso from a substantially supine posture to a more upright seated posture to exercise the core body region including the abdominal and oblique muscles.

The tubing is segmented to allow it to be disassembled to a more compact form if required. It also has a pair of pivots 2 on the opposing sides of the frame close to the bend that may be loosened to allow collapse of the frame 1. The tubing is suitably a flattened steel tubing but may be unflattened and/ or of aluminium or other robust metal/ alloy or even formed as moulding of a suitable robust plastics polymer.

The upper part of the frame's upstanding portion 1b that serves as a handle bar spanning over the user's body incorporates a key part of the componentry for the game control function of the frame. It is here that the motion-sensing unit 11, 12, 13 of an external games system is mounted to the frame 1, as best illustrated in Figures 3, 3A, 3B, 4 and 4A. Such motion-sensing unit 11, 12, 13 is exemplified by the motion-sensing remote unit ("wand") of a Wii^(R) system; the equivalent newly-developed remote unit of a PS3^(R) system; or even an iPhone^(R) or iPod Touch^(R). Though the latter two may lack wirelessly linked consoles and screens they are, when playing appropriate games software, still motion-sensing units of their own self-contained games systems.

The motion-sensing unit 11, 12, 13 is mounted to the handlebar part of the frame's upstanding portion 1b by provision of a dock 8, 9, 10. The dock 8, 9, 10 is a socket that is of a size, shape and form adapted to securely accommodate the respective motion-sensing unit 11, 12, 13 in use so that it will remain securely in place while exercising and yet allowing the unit 11, 12, 13 to be demounted with ease after use. The dock 8, 9, 10 may have a latch at the front rim of the socket to releasably hold the motion-sensing unit or may simply have a reasonably tight friction fit rim and/ or inner-wall to the socket to prevent the unit 11, 12, 13 from dropping out or being dislodged by the rocking motion.

The dock 8, 9, 10 thus de-mountably holds in use the motion-sensing unit 11, 12, 13 of an external games system whereby the apparatus may control one or more aspects of game play on the games system by the sensing of motion by the motion-sensing unit 11, 12, 13.

As can be seen in Figures 1, 2, 2A and 2B, the frame 1 has built into it a set of game control switches that include selection (or variable function) control buttons 7, a joy-stick 6 and trigger 5 and which are linked to the dock 8, 9, 10. The dock 8, 9, 10 incorporates an electrical connector 20 to communicate with the fitted motion-sensing unit 11, 12, 13.

A battery compartment 14 (see Figure 3) is built into the frame 1 to power the game control features or the frame 1 may be coupled to a mains power supply through a transformer or circuit breaker or has an energy harvesting facility built into the frame 1 to capture ambient light energy (eg by solar cells) or kinetic energy from rocking of the frame 1.

An Electromagnetic Radiation (EMR) sensor array 15 is provided centrally on the handlebar part of the frame 1 positioned to face towards the console of the external games system in use and corresponds to the EMR emitter array of the external games system. In the case that the external system is a Wii^(R) system, the sensor array 15 is an IR sensor array equivalent to the array on the Wii^(R) remote/ wand 11. This replaces the

functioning of the IR sensor array on the Wii^(R) remote/ wand 11 when the latter is fitted to the dock 8 since in that location the sensor array on the Wii^(R) remote/ wand 11 is not able to function.

5 The frame 1 further incorporates a pair of speakers 3 that are respectively to the left and right of the user in use fitted either side of the headrest 4.

As shown in Figures 6 and 7, the frame further incorporates in or near the electrical connector 20 a unique electronic interface 21 comprising a circuit with a processor that enables effective communication and co-ordination of control of game-play between the controller of the frame and the
10 controller of the motion-sensing unit of the external games system. This enables the control signals of the frame's game control switches and EMR sensor array to be combined with the motion-sensing signals from the docked motion-sensing unit and, for console-based systems such as the Wii and PS3, the output control signals to be transmitted (by wire or
15 normally wirelessly) by the motion-sensing unit to the console.

The electronic interface comprises a custom made PCB board and processor chip 21a which acts as the core of the system, powered by a battery pack 14 or other power supply. The electrical connector 20 connects processor chip 21a to the motion-sensing unit 11, 12, 13 and the
20 processor chip 21a also has connected to it the EMR sensor array 15, the trigger 5, the joystick 6, the selection (or variable function) control buttons 7 and the speakers 3. These are all connected and synchronised/ co-ordinated with the external games system via the PCB board and processor chip 21a. In a preferred embodiment the processor 21a of the
25 electronic interface 21 monitors clock and data signals from the motion sensing unit and receives the signals from the frame's game control switches 5, 6, 7 and EMR sensor array 15 and synchronises them to the signals from the motion sensing unit 11, 12, 13 and then exports the control signals to the docked motion-sensing unit to be used thereby and/
30 or, for the console-based systems, to be transmitted to the console to be used thereby for controlling the game play.

The rocking frame apparatus 1 allows the user to perform rocking exercises that are a type of controlled "sit-up" or "ab-crunch" that will through regular use dramatically improve the user's core body strength and overall fitness. The apparatus allows the user to carry out such
5 exercise while interactively using the exercise as part of game-play thereby making exercise less tedious and game-play more beneficial to the bodily health of the user .

The present invention has been described above with respect to a
10 particularly preferred embodiment. In further arrangements the motion-sensing unit may be integrated into the frame. Also, the frame as shown in Figure 5 might be configured with an EMR emitter rather than sensor and be thereby better adapted for use with the upcoming new Microsoft Project
15 Natal games system which uses a high tech camera at the console for game control. Control signals may be transmitted from the emitter on the frame to the console.

Claims

1. A game control apparatus for controlling computer game play that comprises: a floor-standing rocking exercise frame having a base portion with a rocker section, the base portion of the frame being adapted to pass
5 around behind a user from their left to right hand sides, the frame having an upstanding portion with hand hold that a user may grip to rock the frame and having a dock that de-mountably holds in use a motion-sensing unit of an external games system whereby the apparatus may control one or more aspects of game play on the games system by the sensing of
10 motion by the motion-sensing unit.
2. A game control apparatus as claimed in claim 1, wherein the dock is a socket that is configured to securely accommodate the motion-sensing unit in use so that it will remain securely in place while exercising and yet allowing the unit to be demounted with ease after use.
- 15 3. A game control apparatus as claimed in claim 1 or 2, in combination with a motion sensing unit that comprises: a remote unit of a Wii^(R) system; a remote unit of a PS3^(R) system; an iPhone^(R) or iPod Touch^(R).
4. A game control apparatus as claimed in any preceding claim, wherein the frame has built into it at least one game control switch.
- 20 5. A game control apparatus as claimed in claim 4, wherein the at least one game control switch is linked to the dock for the motion-sensing unit, the dock incorporating an electrical connector to communicate with the motion-sensing unit.
6. A game control apparatus as claimed in any preceding claim, wherein
25 the frame incorporates a battery or other electrical energy supply means to power the game control features.
7. A game control apparatus as claimed in claim 6, wherein the electrical energy supply means comprises an energy harvesting facility to capture ambient light energy or kinetic energy from rocking of the frame.

8. A game control apparatus as claimed in any preceding claim, wherein the frame incorporates an EMR sensor array for use in controlling game-play.
9. A game control apparatus as claimed in claim 8, wherein the sensor array is an IR sensor array.
10. A game control apparatus as claimed in any preceding claim, wherein the upstanding portion of the frame is arched, having a spanning portion that extends from the user's left to right hand sides and which incorporates at least one of: i) the dock; and (where present) ii) the game control switch(es) ; and (where present) iii) the EMR sensor array.
11. A game control apparatus as claimed in any preceding claim, wherein the spanning portion/ handlebar incorporating an adaptable input port (the dock with connector) to hold and connect to an external gaming controller/ remote unit.
12. A game control apparatus as claimed in claim 5, wherein the dock with connector faces towards the user and is substantially centred across the width of the frame.
13. A game control apparatus as claimed in claim 12, wherein the sensor array on the spanning portion/ handlebar is also substantially centred across the width of the frame but faces in the opposite direction, away from the user.
14. A game control apparatus as claimed in any preceding claim, wherein the frame incorporates a head-rest in the part of the base portion that passes behind the user.

15. A game control apparatus as claimed in any preceding claim, wherein the frame may further incorporate a speaker, or a pair of speakers that are respectively to the left and right of the user in use.

16. A game control apparatus as claimed in any preceding claim,
5 wherein the frame further incorporates an electronic interface means that enables effective communication and co-ordination of control of game-play between the controller of the frame and the controller of the motion-sensing unit of the external games system.

17. A game control apparatus as claimed in claim 16, wherein the
10 electronic interface means comprises a processor that enables the control signals of the frame's game control switches and/ or EMR sensor array to be combined with the motion-sensing signals from the docked motion-sensing unit and, for console-based systems, the output control signals to be transmitted by the motion-sensing unit to the console.

18. A game control apparatus as claimed in claim 16 or 17, wherein the
15 electronic interface means comprises a custom made PCB board and processor chip.

19. A game control apparatus for controlling computer game play that
20 comprises in combination: a floor-standing rocking exercise frame having a base portion with a rocker section, the base portion of the frame being adapted to pass around behind a user from their left to right hand sides, the frame having an upstanding portion with hand hold that a user may grip to rock the frame; and a motion-sensing unit of a digital game system whereby the apparatus may control one or more aspects of game play on
25 the games system by the sensing of motion by the motion-sensing unit.

20. A game control apparatus as claimed in any preceding claim, wherein the apparatus acts as a gaming accessory to play games wirelessly.

21. A game control apparatus as hereinbefore described with reference
30 to any suitable combination of the accompanying drawings.

Amendments to the claims have been made as follows:

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Claims

1. A game control apparatus for controlling computer game play that comprises: a floor-standing rocking exercise frame having a base portion with a rocker section, the base portion of the frame being adapted to pass
5 around behind a user from their left to right hand sides, the frame having an upstanding portion with hand hold that a user may grip to rock the frame and having a dock that de-mountably holds in use a motion-sensing unit of an external games system whereby the apparatus may control one or more aspects of game play on the games system by the sensing of
10 motion by the motion-sensing unit wherein the the frame has built into it at least one game control switch and/ or sensor array and has an electronic interface means that enables effective communication and co-ordination of control of game-play between the controller of the frame and the controller of the motion-sensing unit of the external games system and which
15 comprises a processor that is configured to combine the control signals of the frame's game control switches and/ or sensor array with the motion-sensing signals from the docked motion-sensing unit and, for console-based systems, further configured to enable transmission of the output control signals to the console.
- 20 2. A game control apparatus as claimed in claim 1, wherein the dock is a socket that is configured to securely accommodate the motion-sensing unit in use so that it will remain securely in place while exercising and yet allowing the unit to be demounted with ease after use.
3. A game control apparatus as claimed in claim 1 or 2, in combination
25 with a motion sensing unit that comprises: a remote unit of a Wii^(R) system; a remote unit of a PS3^(R) system; an iPhone^(R) or iPod Touch^(R) .
4. A game control apparatus as claimed in any preceding claim, wherein the frame has built into it at least one game control switch.
5. A game control apparatus as claimed in claim 4, wherein the at least
30 one game control switch is linked to the dock for the motion-sensing unit,

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the dock incorporating an electrical connector to communicate with the motion-sensing unit.

6. A game control apparatus as claimed in any preceding claim, wherein the frame incorporates a battery or other electrical energy supply means
5 to power the game control features.

7. A game control apparatus as claimed in claim 6, wherein the electrical energy supply means comprises an energy harvesting facility to capture ambient light energy or kinetic energy from rocking of the frame.

8. A game control apparatus as claimed in any preceding claim, wherein
10 the frame incorporates an EMR sensor array for use in controlling game-play.

9. A game control apparatus as claimed in claim 8, wherein the sensor array is an IR sensor array.

10. A game control apparatus as claimed in any preceding claim, wherein
15 the upstanding portion of the frame is arched, having a spanning portion that extends from the user's left to right hand sides and which incorporates at least one of: i) the dock; and (where present) ii) the game control switch(es) ; and (where present) iii) the EMR sensor array.

20 11. A game control apparatus as claimed in any preceding claim, wherein the spanning portion/ handlebar incorporating an adaptable input port (the dock with connector) to hold and connect to an external gaming controller/ remote unit.

25 12. A game control apparatus as claimed in claim 5, wherein the dock with connector faces towards the user and is substantially centred across the width of the frame.

30 13. A game control apparatus as claimed in claim 12, wherein the sensor array on the spanning portion/ handlebar is also substantially centred

across the width of the frame but faces in the opposite direction, away from the user.

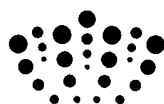
14. A game control apparatus as claimed in any preceding claim, wherein
5 the frame incorporates a head-rest in the part of the base portion that passes behind the user.

15. A game control apparatus as claimed in any preceding claim, wherein
10 the frame may further incorporate a speaker, or a pair of speakers that are respectively to the left and right of the user in use.

16. A game control apparatus as claimed in any preceding claim, wherein the electronic interface means comprises a custom made PCB board and processor chip.

17. A game control apparatus as claimed in any preceding claim, wherein
15 the apparatus acts as a gaming accessory to play games wirelessly.

18. A game control apparatus as hereinbefore described with reference to any suitable combination of the accompanying drawings.



Application No: GB1006295.8

Examiner: Mr Mark Sexton

Claims searched: 1-21

Date of search: 28 May 2010

Patents Act 1977: Search Report under Section 17

Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular relevance
Y	1 & 19 at least	http://iphoneapps.oreilly.com/2009/11/six-pack-ab-exercises.html CrunchFu - 30/11/09
Y	1 & 19 at least	US 2004/097331 A1 (ZILLIG et al.) - see whole document
Y	1 & 19 at least	WO 2007/020663 A1 (VUPIESSE ITALIA) - see whole document
Y	1 & 19 at least	US 5857939 A1 (KAUFMAN) - see whole document
Y	1 & 19 at least	US 2008/171596 A1 (HSU) - see whole document
Y	1 & 19 at least	US 2007/135264 A1 (ROSENBERG) - see whole document

Categories:

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
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Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC^X :

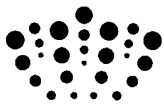
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Worldwide search of patent documents classified in the following areas of the IPC

A63B; A63F; G06F

The following online and other databases have been used in the preparation of this search report

Online:WPI,EPODOC; Full text databases; Internet:Google,Bing
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International Classification:

Subclass	Subgroup	Valid From
A63B	0023/02	01/01/2006
A63B	0024/00	01/01/2006
A63F	0013/06	01/01/2006
G06F	0003/01	01/01/2006