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DESCRIPTION

[0001] The present invention relates to an exercise system comprising two or more exercise apparatuses which are able to track, store and/or transmit data relating to their use.

[0002] Various organisations are interested in the general physical wellbeing of people in certain areas. These include government organisations and health organisations. In connection with this, gym equipment is often made available for use by members of the public in both public and private settings. For example, outdoor gym equipment is often made available for general use in public spaces and indoor gym equipment is often available for use in commercial settings.

[0003] Document US2017/128778 describes an exercise system according to the preamble of claim 1.

[0004] It would be useful to capture data relating to the use of such equipment as a measure of exercise being carried out by members of the public in specific areas.

[0005] This objective is achieved by an exercise system with the features of claim 1.

[0006] According to a first aspect of the invention, the system comprises an exercise apparatus including one or more user-movable members, an electrical energy generator operably connected to the user-movable member, an electrical energy storage element electrically connected to the electrical energy generator, a sensor to sense the use of the apparatus, and a communication interface, wherein the communication interface is powered by the electrical energy storage element, receives data from the sensor relating to the use of the apparatus and is capable of transmitting the data.

[0007] Suitably, the data is transmitted to a remote data collection component.

[0008] The data relating to the use of the apparatus may be electrical energy generated by the generator, the power generated by the generator, the revolutions of the generator (e.g. rpm), the movement of the or each user-movable member, the time the apparatus is in use or any other useful measure of how the apparatus is being used.

[0009] Suitably, the data received by the communication interface is transmitted to a remote data collection component, such as a remote server. Additionally, the data may be transmitted to a local data receiver, for example, a mobile device carried by the user.

[0010] In an embodiment of the invention, the communication interface includes a data storage memory configured to store the data received from the sensor. The communication interface may be connected to a communication network and the data from the communication interface may be transmitted to the remote data collection component via the communication network.

[0011] The communication network may be accessed via a mobile device, such as a mobile device carried by a user. In such an embodiment, the user may connect their mobile device to the communication interface of the apparatus and data stored by the communication interface may be transmitted to the remote data collection component via the user's mobile device. Thus, the data stored by the communication interface may be transmitted to a mobile device, for example via a Bluetooth connection, via a NFC connection, via RF signals or via a wired or wireless local area network (LAN), the data is then processed by software on the mobile device and transmitted via a wireless communication network from the mobile device to the remote data collection component.

[0012] Additionally or alternatively, the communication interface of the apparatus may be connected to a communication network and the data may be transmitted to the remote data collection component directly from the apparatus.

[0013] In embodiments in which the data is transmitted to both the remote data collection component and a local data receiver, the data may be transmitted over communications networks which are the same or different. For example, the data transmitted to the remote data collection component may be transmitted via a mobile telephone network or it may be transmitted via a wired or wireless data network; whereas the data transmitted to the local data receiver may be transmitted via a Bluetooth connection, via a NFC connection, via RF signals or via a wired or wireless local area network (LAN).

[0014] Furthermore, the communications interface may transmit the data at different times. For example, data transmitted to the remote data collection component may be transmitted at set intervals, such as daily, whereas data transmitted to a local data receiver may be transmitted substantially in real time. In other words, data is transmitted as the apparatus is being used. Alternatively, the communication interface may transmit the real time data to a mobile device in a format in which it can be seen by a user, so they can see data relating to their use of the apparatus and it may transmit stored data in a format in which it is hidden from the user.

[0015] The data transmitted to the remote data collection component may be used to establish general data relating to the use of the apparatus, whereas data transmitted to a local data receiver may provide a user with data relating to their personal use of the apparatus.

[0016] As noted above, the remote data collection component may be a server or similar computer equipment. The local data receiver suitably forms part of a mobile device, which may be for example a smartphone or a personal fitness tracker carried by the user.

[0017] The electrical energy storage element suitably comprises one or more rechargeable batteries.

[0018] In addition to powering the communication interface, the electrical energy storage

element may also provide electrical energy to an electrical output socket carried by the apparatus. The electrical output socket may be in the form of a standard output socket, such as a USB socket or similar. The apparatus may further include an electrical output conditioning unit in order to provide an electrical output having a pre-determined voltage and/or current at the output socket. For example, the output socket may be conditioned to have an output voltage of from 1 to 12 volts, for example 5V, 6V or 12V. The local electrical output socket carried by the apparatus may be used by a user to power and/or charge a mobile electrical device.

[0019] According to the present invention, there is provided a system comprising two or more exercise apparatus as defined in connection with the first aspect of the invention. The system includes a base station, wherein each exercise apparatus is connected to the base station and transmits thereto data relating to the use of the respective exercise apparatus; the base station includes a base station communication interface; and the base station communication interface transmits the data relating to the use of the respective exercise apparatus and/or the system as a whole to a remote data collection component. The base station communication interface may transmit the data directly to the remote data collection component via a communication network or it may transmit the data via a mobile device (for example a user's mobile device) which is connected to the base station or one of the exercise apparatus and to a communication network.

[0020] In the embodiment described above, the communication interfaces of each exercise apparatus (the local communication interfaces) may transmit data relating to the use of the respective apparatus to a local data receiver (e.g. mobile device) carried by the user in addition to transmitting the data to the base station.

[0021] The base station communication interface may collate the data transmitted to it by each of the individual exercise apparatus and transmit the collated data to the remote data collection component. In such an embodiment, the base station communication interface suitably includes a data storage component and/or a processor.

[0022] As with the first aspect of the invention, the base station communications interface may transmit the data at pre-determined times. For example, data transmitted by the base station communication interface to the remote data collection component may be transmitted at set intervals, such as daily, whereas data transmitted by the local communication interfaces to the respective local data receivers may be transmitted substantially in real time. In other words, data is transmitted by the local communication interfaces to respective local data receivers as the apparatus is being used.

[0023] The base station includes a common electrical energy storage element and the electrical energy generators of each exercise apparatus are electrically connected to the common electrical energy storage element.

[0024] As noted above, each individual apparatus may include a local power output socket. In

addition to this, embodiments of the third aspect of the invention that include a base station may further include a base station power output. In such embodiments, the base station power output may be the same or different to the power output from the local power output socket. For example, the or each apparatus may include a local power output socket and a first power conditioning unit which conditions the power output from the apparatus to a first pre-determined voltage and/or current, and the base station may include a power output and a second power conditioning unit which conditions the power output from the base station to a second pre-determined voltage and/or current. The second pre-determined voltage and/or current may be the same or different to the first pre-determined voltage and/or current. In an embodiment of the invention, the or each apparatus has an electrical output of 5, 6 or 12V and the base station has an electrical output of 12 or 24V. Suitably, the or each apparatus has an electrical output of 5V and the base station has an electrical output of 24V. The power output from the base station may be used to power one or more light assemblies, one or more CCTV cameras, a wireless communications module or any combination thereof.

[0025] Each exercise apparatus includes a controller which receives signals from a mobile device, processes the signals and configures the exercise apparatus in accordance with the processed signals. For example, the exercise apparatus may include variable parameters, such as resistance, and the controller may vary the parameter in response to signals from the mobile device. In such embodiments, a user may tailor his or her use of the apparatus according to their preference or in accordance with a pre-prepared exercise regime stored on the mobile device. In such embodiments, the communication interface of the apparatus (the local communication interface) may be a two-way communication interface which is capable of both transmitting data and receiving data. The controller is suitably connected to the receiver side of the communication interface.

[0026] Accordingly, the apparatus may include one or more user-movable members having one or more variable parameters and a controller connected to the or each user-movable member, wherein the controller is connected to a communication interface and is configured to vary the or each parameter in response to signals received from the communication interface.

[0027] The communication network may be accessed via a mobile device, such as a mobile device carried by a user. In such an embodiment, the user may connect their mobile device to the communication interface of the apparatus and data stored by the communication interface may be transmitted to the remote data collection component via the user's mobile device. Thus, the data stored by the communication interface may be transmitted to a mobile device, for example via a Bluetooth connection, via a NFC connection, via RF signals or via a wired or wireless local area network (LAN), the data is then processed by software on the mobile device and transmitted via a wireless communication network from the mobile device to the remote data collection component.

[0028] Additionally or alternatively, the communication interface of the apparatus may be connected to a communication network and the data may be transmitted to the remote data collection component directly from the apparatus.

[0029] In embodiments in which the data is transmitted to both the remote data collection component and a local data receiver, the data may be transmitted over communications networks which are the same or different. For example, the data transmitted to the remote data collection component may be transmitted via a mobile telephone network or it may be transmitted via a wired or wireless data network; whereas the data transmitted to the local data receiver may be transmitted via a Bluetooth connection, via a NFC connection, via RF signals or via a wired or wireless local area network (LAN).

[0030] Furthermore, the communication interface may transmit the data at different times. For example, data transmitted to the remote data collection component may be transmitted at set intervals, such as daily, whereas data transmitted to a local data receiver may be transmitted substantially in real time. In other words, data is transmitted as the apparatus is being used. Alternatively, the communication interface may transmit the real time data to a mobile device in a format in which it can be seen by a user, so they can see data relating to their use of the apparatus and it may transmit stored data in a format in which it is hidden from the user.

[0031] The data transmitted to the remote data collection component may be used to establish general data relating to the use of the apparatus, whereas data transmitted to a local data receiver may provide a user with data relating to their personal use of the apparatus.

[0032] As noted above, the remote data collection component may be a server or similar computer equipment. The local data receiver suitably forms part of a mobile device, which may be a smartphone or a personal fitness tracker carried by the user.

[0033] Embodiments of the invention will now be described, by way of example only, with reference to the accompanying drawings in which:

Figure 1 is a schematic representation of a first embodiment of the invention; and

Figure 2 is a schematic representation of a second embodiment of the invention

[0034] Figure 1 shows a schematic representation of an exercise apparatus, such as a recumbent bike, in which a user uses their legs to rotate a pair of offset pedals carried by a rotating drum. The rotating drum is connected to an electrical generator, which in turn is connected to a rechargeable battery via power conditioner which conditions the electrical energy generated by the generator to a voltage and current that is suitable for recharging the battery. Such items of exercise equipment and electrical generators are well known and will not be described in more detail herein.

[0035] In addition to the generator and rechargeable battery, the exercise apparatus further includes a communication interface that includes a Bluetooth transmitter and a data storage memory. Again, such communication interfaces are well known to those skilled in the art and

need not be described herein in more detail.

[0036] A user wishing to use the apparatus may have a mobile device, such as a smartphone, which includes software associated with the apparatus.

[0037] As shown in Figure 1, the use of the apparatus starts with the apparatus in a powered down configuration. The user starts to use the apparatus and in so doing, turns the rotatable drum which in turn rotates the electrical generator and generates electrical energy. The electrical energy generated by the generator powers the communication interface.

[0038] In a first scenario, the user connects a mobile device to the communication interface via a Bluetooth connection. Once connected, the communication interface transmits data stored in its data memory and live (i.e. real time) exercise data to the mobile device. Software carried by the device allows the user to see the live exercise data (such as electrical energy generated by the generator), but not the stored exercise data from the data memory. The live exercise data is displayed on a screen of the mobile device as the user uses the apparatus.

[0039] When the user stops using the apparatus, the software detects this and transmits both the live exercise data and the stored exercise data to a remote data collection server via a communications network to which the mobile device is connected, such as a mobile telephone network.

[0040] When the apparatus has not been used for a pre-determined period of time, the communication interface powers down.

[0041] In an alternative embodiment not shown in the figures, the communication interface is connected to a communications network. In such an embodiment, the user uses the apparatus as described above and the live exercise data is transmitted to the user's mobile device. However, the stored data is not transmitted to the mobile device. At the end of each user session, the exercise data for that session is stored in the data memory of the communication interface. At predetermined times, the stored exercise data held in the data memory is transmitted over the communications network directly by the communication interface to the remote data collection server. In such an embodiment, the user's mobile device is able to display the live exercise data and optionally store this data, but the mobile device does not transmit any data to the remote data collection server.

[0042] A second scenario is also shown in Figure 1. In the second scenario, a user uses the apparatus without connecting to it a mobile device. In this case, the exercise data is stored on the communication interface. The stored date is then transmitted to the remote data collection server either via the mobile device of a user who connects the device to the apparatus or via the communication interface directly in examples in which the communication interface is connected directly to a communication network. In this second scenario, a local display carried by the apparatus may display exercise data or the user may exercise without being aware of the exercise data.

[0043] A further embodiment is shown in Figure 2. The use of the apparatus and the transmission of both live exercise and stored (historical) exercise data is the same as described above. The difference between the further embodiment shown in Figure 2 and the embodiments described above is that in the embodiment shown in Figure 2, the user is able to modify the exercise parameters of the apparatus. Thus, the exercise apparatus of the embodiment shown schematically in Figure 2 includes at least one variable parameter, such as resistance to the rotation of the drum of the apparatus. In this embodiment, the user is able to modify or adjust the resistance of the drum via their mobile device. Thus, the mobile device is able to transmit data to the communication interface, which in turn is connected to a controllable element which applies a frictional force to the drum or a component of the apparatus which is connected to the drum such that the resistance to the rotation of the drum can be varied. In this way, signals from the mobile device are transmitted to the communication interface, which in turn varies the resistance of the drum in response to the signals.

[0044] The user is therefore able to manually vary the resistance via the mobile device or the mobile device may have one or more pre-programmed sequences of resistance values which are transmitted to the communication interface.

[0045] As with the embodiments described above, the exercise data may be transmitted to the remote data collection server directly from the communication interface where the communication interface is connected to a communications network, or via the mobile device of a user.

REFERENCES CITED IN THE DESCRIPTION

Cited references

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Patent documents cited in the description

- US2017128778A [0003]

TRÆNINGSAPPARAT

PATENTKRAV

1. Træningssystem, der omfatter to eller flere træningsapparater og en basisstation, hvor hvert apparat indbefatter ét eller flere brugerbevægelige elementer, en elektrisk energigenerator, der er operativt forbundet med det brugerbevægelige element, et elektrisk energilagringselement, der er elektrisk forbundet med den elektriske energigenerator, en sensor til at registrere anvendelse af apparatet og en kommunikationsgrænseflade, og hvor kommunikationsgrænsefladen forsynes med strøm af det elektriske energilagringselement, er konfigureret til at modtage træningsdata fra sensoren vedrørende anvendelse af apparatet og i stand til at overføre træningsdataene, hvor hvert træningsapparat er forbundet med basisstationen og konfigureret til at overføre træningsdata dertil vedrørende anvendelse af det pågældende træningsapparat; basisstationen indbefatter en kommunikationsgrænseflade til basisstationen; og basisstationens kommunikationsgrænseflade er i stand til at overføre træningsdata vedrørende anvendelsen af det pågældende træningsapparat og/eller systemet i sin helhed;

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basisstationen indbefatter et genopladeligt batteri, og elektrisk energi genereret af hvert træningsapparat lagres i basisstationens genopladelige batteri.

2. Træningssystem ifølge krav 1, hvor basisstationens kommunikationsgrænseflade indbefatter en træningsdatalagringshukommelse, der er konfigureret til at lagre træningsdata modtaget fra træningsapparatet.

3. Træningssystem ifølge krav 1 eller krav 2, hvor basisstationens kommunikationsgrænseflade er forbundet med et kommunikationsnetværk, og træningsdata overføres via kommunikationsnetværket.

4. Træningssystem ifølge krav 3, hvor basisstationens kommunikationsgrænseflade er direkte forbundet med kommunikationsnetværket, og træningsdata overføres af basisstationens kommunikationsgrænseflade på forhåndsbestemte tidspunkter.

5. Træningssystem ifølge krav 3, hvor basisstationens kommunikationsgrænseflade er forbundet med kommunikationsnetværket via en mobilenhed båret af en bruger.

6. Træningssystem ifølge et hvilket som helst af kravene 1 til 5, hvor hvert træningsapparat indbefatter mindst ét variabelt parameter; indbefatter en styreenhed, der modtager signaler fra en mobilenhed; og konfigurerer træningsapparatets variable eller hvert af dets variable parametre i overensstemmelse med de signaler, der er modtaget af styreenheden.

7. Træningssystem ifølge krav 6, hvor det variable parameter er modstand mod bevægelse af det brugerbevægelige element.

DRAWINGS

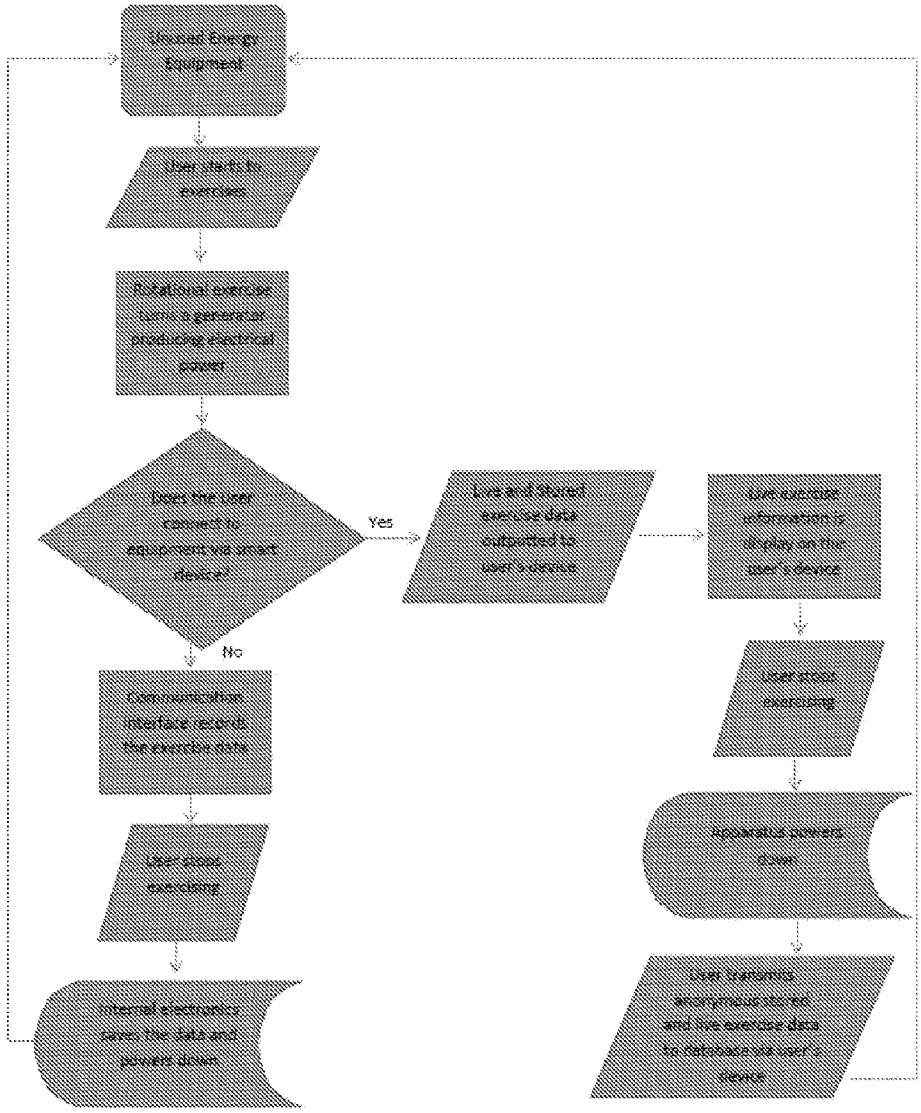

Fig 1

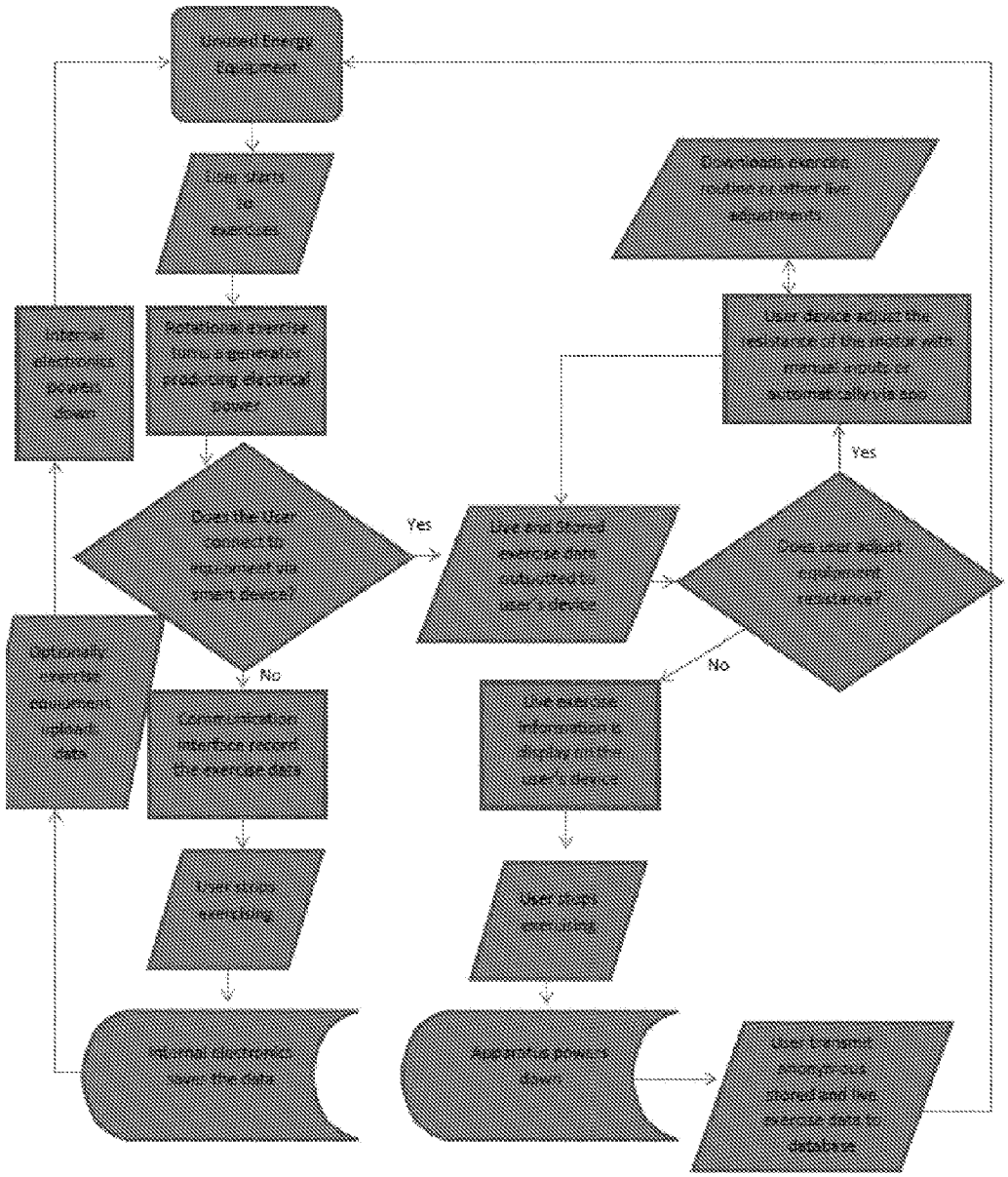

Fig 2