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(54) Workstation, method for workstation and computer program product

(57) There is provided a workstation (500), a method for a workstation and a computer program product. The workstation comprises a work surface (506) supported at a height above a floor (512) and an exercise apparatus (508) supported on the floor (512) next to the work surface (506) such that a user operating the exercise apparatus (508) is in a position for working on the work surface (506), said exercise apparatus (508) extending on the floor (512) away from the work surface (506), and a platform (502) for a seat, said platform (502) including means for moving the platform (502) with respect to the work surface (506), wherein the workstation is adapted to receive the means for moving the platform (502) such that the platform (502) is movable on the exercise apparatus (508) to different distances from the work surface (506) on at least one straightforward path of movement and, wherein at said distances the same portion of the work surface (506) is towards the user positioned for working at the work surface (506), said distances comprising at least one distance defining a position of the platform (502) with respect to the work surface (506) for operating the exercise apparatus (508) and at least one position of the platform (502) with respect to the work surface (506), where the user is seated.

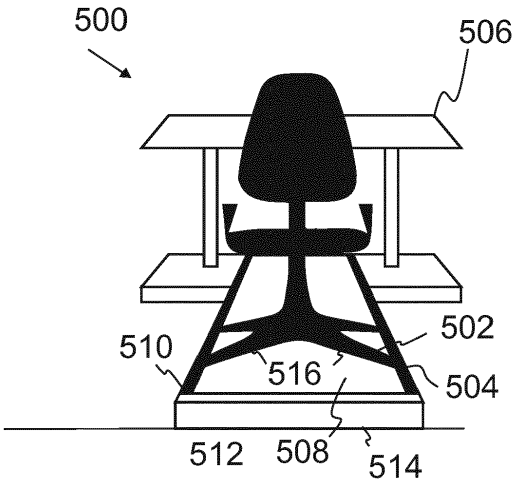

Figure 5

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Description

FIELD

[0001] The present invention relates to a workstation and particularly to a workstation comprising an exercise apparatus and a work surface.

BACKGROUND

[0002] Workstations typically comprise a table serving as a work surface and a chair positioned next to the table such that a person can work on the table when he/she is seated on the chair. The chair can have wheels connected to a stand on which a seat for the person is positioned. The wheels allow the movement of the chair, when the person is seated.

[0003] Desktop work is a particular work that is typically performed in a workstation. In desktop work the person may be working seated or in an upright position next to a work surface. Desktop work and immobile working position poses the worker the several health risks. The person should conduct physical activities during the workday to prevent these risks. However, leaving the place of work for the exercise can be difficult or even impossible. After a day of desktop work the person can go to a health club, where he/she can work out using various exercising apparatus including a treadmill.

[0004] US2006/0247109 describes a combination of exercise apparatus and a computer workstation. A movable seat is integrated to the computer workstation. The seat can be rotated away from a working surface for operating the treadmill.

[0005] In the combination of the treadmill and computer workstation, the movement of the seat requires space next to the workstation. This means that workstations cannot be positioned close to another workstation which decreases the efficiency of the use of office floor space.

[0006] On the other hand, in the combination of the treadmill and computer workstation, the seat is integrated to the workstation and cannot be easily replaced. Moreover, the integration of the seat to the workstation poses restrictions on the properties of the seats that may be used with the workstation.

BRIEF DESCRIPTION

[0007] An object of the present invention is to provide workstation, method and computer program product so as to alleviate at least part of the above disadvantages. The objects of the invention are achieved by a workstation, method and computer program product, which are characterized by what is stated in the independent claims. The preferred embodiments of the invention are disclosed in the dependent claims.

[0008] According to an aspect there is provided a workstation, comprising a work surface supported at a height above a floor and an exercise apparatus supported on the floor next to the work surface such that a user operating the exercise apparatus is in a position for working on the work surface, said exercise apparatus extending on the floor away from the work surface, and a platform for a seat, said platform including means for moving the platform with respect to the work surface, wherein the workstation is adapted to receive the means for moving the platform such that the platform is movable on the exercise apparatus to different distances from the work surface on at least one straightforward path of movement and, wherein at said distances the same portion of the work surface is towards the user positioned for working at the work surface, said distances comprising at least one distance defining a position of the platform with respect to the work surface for operating the exercise apparatus and at least one position of the platform with respect to the work surface, where the user is seated.

[0009] According to an aspect there is provided a method for a workstation comprising a work surface, an exercise apparatus supported on the floor next to the work surface such that a user operating the exercise apparatus is in a position for working on the work surface, a platform for a seat, a drive system for driving the work surface to different heights above the floor, one or more sensors installed to locations in the workstation for measuring movement of the work surface of the platform, and a controller operatively connected to the sensors and drive system, and arranged to cause determining a movement of the platform on the exercise apparatus to different distances from the work surface on at least one straightforward path of movement and, wherein at said distances the same portion of the work surface is towards the user positioned for working at the work surface, said distances comprising at least one distance defining a position of the platform with respect to the work surface for operating the exercise apparatus and at least one position of the platform with respect to the work surface, where the user is seated, driving the work surface or the exercise apparatus to a different position on the basis of the determined movement.

[0010] According to an aspect there is provided a computer program product comprising executable code that when executed, cause execution of functions of a method according to an aspect.

[0011] According to an aspect there is provided a computer program embodied on a non-transitory computer readable storage medium, the computer program being configured to control a processor to perform a method according to an aspect.

[0012] According to an aspect there is provided a workstation according to an aspect including means to perform a method according to an aspect.

[0013] Some embodiments provide flexibility to workstations used for office work. The seat may be positioned to different distances from the work surface such that the use of different seats and working positions are facilitated in the workstation. In different positions of the platform with respect to the work surface, the work at hand may

be located at the same portion of the work surface.

[0014] Further improvements will become apparent from the detailed description.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015] In the following the invention will be described in greater detail by means of preferred embodiments with reference to the attached drawings, in which

Figure 1 illustrates a workstation comprising an exercise apparatus and a platform for a seat movable in a straightforward path on the exercise apparatus, according to an embodiment;
Figure 2 illustrates various seats attachable to a platform according to an embodiment;
Figures 3, 4 and 5 illustrate adaptations of the workstation for receiving the platform such that the platform is movable on the exercise apparatus, according to an embodiment;
Figure 6 illustrates side surfaces in a workstation according to an embodiment;
Figures 7a, 7b, 7c, 7d, 7e and 7f illustrate platforms guided by rails in a workstation according to an embodiment;
Figure 8 illustrates suitable locations for a brake arrangement in a workstation according to an embodiment;
Figures 9a, 9b, 9c and 9d are profile views of brake arrangements as viewed from one end of the exercise apparatus in a workstation according to an embodiment;
Figures 10a and 10b illustrate a display stand in a workstation according to an embodiment;
Figure 11 is an architectural view of the workstation according to an embodiment;
Figures 12a and 12b illustrate operation of a treadmill in a workstation according to an embodiment;
Figures 13a and 13b illustrate structural arrangements of parts of the workstation according to an embodiment;
Figure 14 illustrates examples of measurements performed by sensors of the workstation according to an embodiment;
Figure 15 illustrates implementation of the workstation according to an embodiment;
Figure 16 illustrates location of the control unit in a work surface according to an embodiment;
Figures 17a and 18a illustrate movement of the seat in a platform according to an embodiment;
Figures 17b, 18b and 18c illustrate structures of platforms having a movable seat;
Figure 19 illustrates a process for a workstation according to an embodiment;
Figure 20 illustrates various working positions of the workstation according to an embodiment;
Figure 21 illustrates transitions between working positions according to an embodiment; and
Figure 22 illustrates a process for measuring performance in a workstation according to an embodiment.

DETAILED DESCRIPTION OF THE INVENTION

[0016] Figures 1a, 1b, 1c and 1d illustrate a workstation comprising a work surface 102a, 102b, 102c, 102d, an exercise apparatus 104 and a platform 106 for a seat 108 movable on the exercise apparatus to different distances d_a, d_b, d_c, d_d from the work surface on at least one straightforward path, according to an embodiment. The view of the workstation is from the side of the workstation, whereby a user 112 working on the work surface is positioned sideways to the viewing direction. At different distances of the platform with respect to the work surface the same portion 110 of the work surface is towards the user positioned for working at the work surface. In this way the work at hand may be located at the same portion of the work surface in different positions of the platform with respect to the work surface. The work at hand may comprise working by using a computer, a computer display or computer accessory e.g. keyboards and other interface devices on the work surface, reading, writing, etc. The work at hand does not have to be moved to a different position on the work surface even if the platform is moved from one distance to another distance for working on the work surface.

[0017] By positioning the chair on the platform and on the exercise apparatus, e.g. treadmill, a single work position in relation to the work surface may be provided, where the same portion of the work surface is used for working when working seated/standing/walking and the change between these positions is quick and convenient. The person working on the work surface does not have to move horizontally i.e. left or right in relation to the work surface, when he/she changes the working position.

[0018] Some work in the workstation may be done while walking, e.g. talking in telephone, but some work may require a seated position, e.g. drawing on the work surface. Placing the seat on treadmill in said manner allows the change between the positions to be quick and convenient and therefore saves time.

[0019] The work surface supported at a height h_a, h_b, h_c, h_d above a floor 110. The exercise apparatus is positioned on the floor next to the work surface such that a user operating the exercise apparatus is in a position for working on the work surface. The exercise apparatus extends on the floor away from the work surface, such that the exercise apparatus allows the user positioned next to the work surface to operate the exercise apparatus, while the user works on the work surface. Exercise apparatuses may be operated differently depending on the structure of the exercise apparatus. The structure of each kind of exercise apparatus is typically adapted to train a certain part of the human body. This means that the user operating the exercise apparatus may be moving differently and different parts of the body depending on the

kind of the exercise apparatus. Examples of the possible movements of the user operating the exercise apparatus comprise standing, rowing, pedaling, walking and running. Accordingly, the exercise apparatus may comprise a rowing machine, a cross-trainer, a treadmill or an exercise bike, for example. The cross-trainer or elliptical trainer is conventionally also referred to as X-trainer. A treadmill may be a treadmill for running and/or walking. A treadmill conventionally has a belt that is running at a speed for running, jogging or walking on the treadmill. In an embodiment, the treadmill may be designed only for walking, whereby the treadmill can have a shorter belt than a treadmill for running. In this way the space required by the workstation may be reduced.

[0020] In Figure 1a, the work surface is illustrated at a height h_a above the floor that allows working on the work surface, when the user is seated. Typically the work surfaces for seated work are arranged at height, where the user seated before the work surface such that the upper arm and the forearm of the user is at about 90 degrees angle, when the forearm is positioned on the work surface. Suitable heights for most users working in a seated position include heights between 70 cm to 100 cm.

[0021] In Figure 1b, the work surface is illustrated at a height h_b above the floor that allows working on the work surface, when the user is in a half-standing position before the work surface. In the half-standing position the user is partly seated and partly standing. In Figures 1c and 1d, the work surface is illustrated at a height h_c, h_d above the floor that allows working on the work surface, when the user is in an upright position before the work surface. The height of the work surface in Figures 1b, 1c and 1d may be determined in a similar manner as in the work surface in Figure 1 a with the difference that the absolute height is greater in the half-standing position of the user than in the seated position of the user, and the absolute height is greater in the upright position of the user than in the half-standing position of the user. In the upright position the user may be operating the exercise apparatus. The height of the work surface in the upright position and combined with operating the exercise apparatus may be used to determine yet another height of the work surface such that the working on the work surface is facilitated in the combined situation of the upright position of the user and the user operating the exercise apparatus. Examples of the combined situations include situations, where the user is walking or running on a treadmill, or working out on a cross-trainer.

[0022] The platform is movable on the exercise apparatus in the direction that is substantially perpendicular to the viewing direction of Figures 1a to 1d. In Figures 1 a and 1 b, the platform is moved to a distance d_a, d_b defining a position of the platform with respect to the work surface, in which position the user is seated before the work surface for working on the work surface. In Figures 1c and 1d, the platform is moved to a distance d_c, d_d defining a position of the platform with respect to the work surface which position allows operating the exercise apparatus. In Figures 1c and 1d, the position of the platform with respect to the work surface allows preferably the user also to work on the work surface. The combined working on the work surface and operating the exercise apparatus is facilitated by the position of the platform as well as the height of the work surface.

[0023] In Figure 1c, the platform is positioned under the work surface. In this way the space away from the work surface and behind the user, is free from obstacles. In Figure 1d, the platform is moved to a distance from the work surface that exceeds a maximum distance of the straightforward path of movement and the platform is removed from the workstation. In this way the platform may be moved anywhere around to workstation or to another room and the workstation is free from obstacles, when the user operates the exercise apparatus.

[0024] Figure 2 illustrates various seats 204, 214, 224, 234 attachable to a platform 202 according to an embodiment. The platform may comprise a receiving member and the various seats may comprise attachment members that are configured to communicate with the receiving member such that the seat is attached to the platform, when the seat is positioned on the platform. In this way the seat attached to the platform may be changed to match various personal needs and/ requirements concerning functionalities of the seat. In one example the seat may be a seat configured for half-standing seating position of the user. Such a seat may be the saddle seat 204 for example.

[0025] Figures 3, 4 and 5 illustrate adaptations of the workstation 300, 400, 500 for receiving a platform 302, 402, 502 for a seat such that the platform is movable on an exercise apparatus 308, 408, 508, according to an embodiment. The platform comprises means 304, 404, 504, for moving the platform on the exercise apparatus to different distances from a work surface 306, 406, 506 on at least one straightforward path of movement. The workstation may be the workstation of Figures 1a to 1d. Different working position, e.g. an upright position, a half-standing position or a seated position may be obtained by height adjustment of the platform and position of the platform with respect to the work surface. The seat attached to the platform may be changed into any seat that has an attachment member for attaching to the receiving member of the platform as described in Figure 2. In this way, working position of the user may be adapted to various working positions and according to personal needs.

[0026] In Figure 3 the platform comprises wheels that provide the movement of the platform on the exercise apparatus. The wheels 304 are installed to ends of support structures 308 of the platform such that they are between the floor 312 and the support structures 316. The support structures extend vertically h_p and horizontally w_p below the seat towards the sides of the exercise apparatus such that the exercise 308 apparatus fits between the support structures and the floor, when the platform is received by the workstation. When the platform is received by the workstation, the platform is positioned

on the exercise apparatus. The vertical height h_p and the horizontal width w_p of the platform may be determined by the width and height of the exercise apparatus. Preferably, the support structures and the exercise apparatus are adapted with respect to each other such that the height and width of the exercise apparatus are smaller than the height and width of the platform defined. The height of the platform may be measured as the height from the floor at the position of the maximum height of the exercise apparatus. The width of the platform maybe measured as a distance between the wheels on opposite sides of the exercise apparatus. The support structures may be dimensioned according to the height and width information of the platform to provide movement of the platform on the exercise apparatus to different distances with respect to the work surface.

[0027] In Figures 4 and 5 the exercise apparatus comprises rails 410, 510 that provide the movement of the platform on the exercise apparatus. The rails are installed to the sides of the exercise apparatus and in a direction defined by the path of movement of the platform. The platform comprises support structures 416, 516 that extend vertically h_{pr} and horizontally w_{pr} below the seat such that the exercise apparatus fits below the support structures and the seat, when the platform is received by the workstation. The height of the platform may be measured as the height from the exercise apparatus. The width of the platform maybe measured as a distance between the ends of the support structures. The ends of the support structures 404, 504 are adapted to communicate with the rails such that the platform is movable on the rails and supported by the rails against vertical movement receive the platform. In this way the exercise apparatus is supported on the floor 412, 512 and the platform is supported to the exercise apparatus via the rails. In the embodiments of Figures 4 and 5 the width of the platform may be substantially the width of the exercise apparatus that includes the rails, but in the embodiment of Figure 3, the width of the platform exceeds the width of the exercise apparatus. Figures 7a to 7d illustrate in more detail various embodiments of the rails and corresponding support structures.

[0028] In the embodiments of Figures 3 and 4, the platform may be moved off the workstation. In Figure 3, the platform may be rolled on the wheels off the platform from the far end of the exercise apparatus with respect to the work surface. Provided that the width of the platform is large enough such that the wheels are sufficiently removed from the sides of the exercise apparatus, the platform may be lifted off the exercise apparatus. In Figure 4, the platform may be moved off the rails from the far end of the exercise apparatus with respect to the work surface. The ends 404 of the support structures are preferably shaped such that the platform may be positioned on the floor for seating on the platform that is removed from the rails.

[0029] In Figure 5, the work station may correspond to the workstation of Figure 4 with the difference that the far end of the rails with respect to the work surface is installed a terminal 514. The terminal is positioned at the end of the rails and keeps the platform on the rails. Accordingly, the platform may not be removed from the workstation via the ends of the rails at the far end of the exercise apparatus. In this way, accidental movement of the rails may be prevented for safety in the use of the platform. The terminal can be optional accessory in the workstation and it can be attached and removed according to the user preferences.

[0030] Figure 6 illustrates side surfaces 602 in a workstation 600 according to an embodiment. The work station may be the workstation in Figures 1 a to 1d. The side surfaces 602 are located on opposite sides of the exercise apparatus 604. The side surfaces extend the horizontal width w_{tot} of the exercise apparatus by the width w_s of the side surfaces such that the total horizontal width becomes $w_{tot} = w_e + w_s + w_s$, where w_e is the width of the exercise apparatus. The side surfaces on the opposite sides of the exercise apparatus may be mirror images of each other. The side surfaces are preferably positioned to the workstation such that the side surfaces and the exercise apparatus form a combined surface that is extended by the side surfaces in the width direction W_{ws} of the work surface. Preferably the combined surface forms a substantially uniform surface such that the person seated working on the work surface may move on foot in the width direction of the work surface without a danger of tripping. On the other hand, when the person is seated the side supports give support to the feet. In this way the working positions may be provided in the width direction of the work surface and on a wider area than the exercise apparatus can provide. Preferably the widths of the side surfaces are such that the total width w_{tot} of the combined surface corresponds to the width of the work surface. The side surfaces also enable conventional chairs that have wheels as are known from many offices to be used with the exercise apparatus.

[0031] Figures 7a, 7b, 7c, 7d, 7e and 7f illustrate platforms guided by rails in a workstation according to an embodiment. The workstation may be the workstation of Figures 4 or 5. Figures 7a to 7c and 7f are profile views as viewed from one end of the exercise apparatus 702, 712, 722, 732, 742. The profiles illustrate different structures for providing the rails in the workstation. Figure 7d shows a wheel arrangement of the platform for the rail illustrated in Figure 7c.

[0032] In Figure 7a, the exercise apparatus has a protrusion 706 that extends horizontally outwards from the top surface of the exercise apparatus. The platform has support structures 704 that attach to the protrusion. The ends are shaped to curve around the protrusion, when the platform attached to the exercise apparatus. Accordingly, the ends have a hook-like shape. The exercise apparatus may have protrusions on both sides of the exercise apparatus as illustrated in Figure 4 by the rails on both sides of the exercise apparatus. The protrusions support the platform against vertical movement. In this

way safety may be provided for seated and half-standing working on the work surface.

[0033] In Figure 7b the exercise apparatus has a groove 716. The groove runs on the side of the exercise apparatus for moving the platform as guided by the groove. The platform has support structures 714 that attach to the groove. The attachment is provided by the shape of the ends of the support structures towards the floor. The ends have protrusions that extend horizontally towards the exercise apparatus such that the protrusions are supported to the groove. The exercise apparatus may have protrusions on both sides of the exercise apparatus as illustrated in Figure 4 by the parallel rails. The grooves support he platform against vertical movement. In this way safety may be provided for seated and half-standing working on the work surface.

[0034] In Figure 7c the exercise apparatus 722 has a protrusion 726 similar to the protrusion in Figure 7a with the differences that the protrusion has a concave surface 730 towards the floor. The platform has support structures 724 that have wheels 728. The wheels may be fixed, such that they do not turn around a vertical axis. In this way the platform may be kept on a straightforward path, when moved.

[0035] Figure 7d shows a wheel arrangement of the platform for the rail illustrated in Figure 7c. The wheel arrangement comprises a wheel 752 that moves the platform on the floor and a wheel 754 that guides the platform in a trail 756 formed by the concave surface of the protrusion towards the floor. The guiding wheel is in contact with the concave surface for guiding the movement of the platform. The floor wheel does not need to contact the concave surface. Accordingly, the arrangement of the wheels may be such that the guiding wheel is in contact with the concave surface and the floor wheel is in contact with the floor, when the platform is on the exercise apparatus. In this way the friction of movement on the floor level may be controlled separately from the friction of movement caused by the concave surface, whereby the wheels and contact surfaces may be adapted for each purpose.

[0036] In Figure 7e the exercise apparatus 732 has a protrusion 736 similar to the protrusion in Figure 7c. The platform has support structures 734 that have wheels 738 similar to Figure 7d. The exercise apparatus also has another protrusion 740 that is below the protrusion extending from the top surface. The lower protrusion may be extending below the upper protrusion such that the height between the protrusions allows the wheel 738 between the protrusions to fit and roll between the protrusions. The lower protrusion may have a concave surface for guiding the wheel similar to the upper protrusion, but with the difference that the concave surface is upwards, to the wheel.

[0037] In Figure 7f the exercise apparatus 742 has a protrusion 746 similar to the protrusion in Figure 7a. However, the support structures 744 of the platform have been adapted such that the platform is movable on the floor by attaching wheels 748 to the ends of the platform.

[0038] Figure 8 illustrates suitable locations 802, 804 for a brake arrangement in a workstation 800 according to an embodiment. The workstation may be the workstation in Figures 4 or 5. The brake arrangement prevents the platform in the workstation from moving with respect to the work surface. The brake arrangement may comprise one or more braking surfaces and levers that are operatively coupled such that, when a lever is operated, braking surfaces are pressed against each other and the braking surfaces are in a closed position and the brake is closed. When the lever is not operated, the braking surfaces may be in an open position, where there is no contact between them and the brake is open. When the braking surfaces are pressed against each other, friction between the braking surfaces causes a force that resists movement of the platform. The parts of the brake arrangement may be distributed between different locations or they may be positioned to a single location in the workstation depending on implementation of the brake arrangement.

[0039] Figures 9a, 9b, 9c and 9d are profile views of brake arrangements as viewed from one end of the exercise apparatus 902, 912 in a workstation according to an embodiment. The brake arrangement comprises a braking surface 904, 914 installed to a support structure of the platform. In figures 9a and 9b the braking surface is installed to a support structure of the platform in a horizontal direction. In figures 9c and 9d the braking surface is installed to a support structure of the platform in a vertical direction. In Figures 9a and 9c the braking surface on the exercise apparatus is not in contact to a meeting surface and the brake arrangement is in an open position, whereby the platform may be moved without the brake arrangement preventing it. In figures 9b and 9d, the brake arrangement is a closed position, whereby the braking surface is pressed to the meeting surface on the exercise apparatus. The exercise apparatus may have friction material located in its surface that is pressed against the braking surface. In this way the braking effect may be improved. Preferably, the braking surface and the surface of the exercise apparatus may have a high friction coefficient in the meeting surfaces for efficient braking of the platform.

[0040] The horizontal braking surface 904 may operate against the top surface of the exercise apparatus. The vertical braking surface 914 may utilize a rail on the side of the exercise apparatus. The rail may be provided by a protrusion 916 according to the illustration of Figures 9c and 9d. The braking surface may be adapted to the shape of the protrusion. In this way the total area of the surfaces pressed against each other is greater than if the braking surface would meet the side of the exercise apparatus without the protrusion. In the illustration, the end of the protrusions towards the braking surface is convex and the braking surface has a concave form matching to the convex form of the protrusion such that the surfaces are pressed against each other, when the brake is closed.

It should be appreciated that a braking surface may be matched also to other shapes of the rails than the protrusions. Figures 7b, 7c and 7e illustrate examples of different shapes of rails that the braking surface may be matched to. Accordingly, the braking surface may be shaped for engaging rails including protrusions or grooves of different shapes and numbers. The braking surface may be operated by a lever (not shown). The lever may be manual lever movable by a foot or an arm of the user positioned in the workstation. On the other hand an electrical motor may be arranged to drive the brake between the closed and open positions. Moreover, an electromagnetic brake may be used, such that the braking surface is moved between the closed and the open position by switching of the electric current on and off.

[0041] Figures 10a and 10b illustrate a display stand 1002 in a workstation according to an embodiment. The display stand may form a part of the work surface 1004. The workstation may be the workstation in Figures 1a to 1d. A computer display may be positioned on the display stand of the workstation according to the illustration. Preferably, the display stand is located in a portion of the work surface that is remote from the user that is seated, or standing and/or operating the exercise apparatus 1006 in the workstation. In Figure 10a, the display stand is shown at a height for seated work h_{ds} and in Figure 10b the display stand is shown at a height h_{dw} for working on the work surface in an upright position, e.g. for working, when the user is walking or standing. The display stand may be driven to different heights by an electrical motor or a manual arrangement for height adjustment that are well-known from current office desks.

[0042] It should be appreciated that, when work is performed in a seated position or a standing next to the work surface, the height of the display may be substantially the same. However, when the work is performed next to the work surface, while walking on the treadmill, the person walking has his/hers eyesight directed to a higher level, than, when working in a seated position or standing. An embodiment provides a workstation that has several states that are defined by the working positions. Each working position, e.g. standing, walking, running, half-standing or seated position, may have its own state. The state may be defined by a position of the work surface, position of the platform, operating mode of the exercise apparatus and/or position of the display stand. A change of the current state may be determined by a change of any of the position of the work surface, position of the platform, operating mode of the exercise apparatus and/or position of the display stand. The next state may be determined on the basis of the changed information that indicates the next state. The exercise apparatus may be a treadmill, whereby the operating modes may comprise belt running, belt stopped, belt speed, walking, jogging or running. In this way, the workstation may determine a change of the operating mode of the exercise apparatus, determine a next state of the workstation that corresponds to the new operating mode of the exercise apparatus, and drive the work surface, platform, exercise apparatus and/or the display stand to their new positions or operating mode that are defined by the next state. The state transitions of the workstation are described in more detail below with reference to Figures 19, 20 and 21.

[0043] In an embodiment, a display stand may be driven to a new position together with the work surface on the basis of the determined operating mode. For example, the display stand may have an automated elevation or lowering with the elevation or lowering of the work surface. When the work surface is driven upwards or downwards the display stand is moved to the same direction automatically with the work surface. The altitudes of the work surface and the display with respect to each other may be different in different working positions, e.g. seated working, standing, walking, running, half-standing or jogging. When the display stand and the work surface are elevated or lowered their absolute distance of movement may be different. Indeed, the adjustment length of the display stand may be shorter than adjustment length of the work surface, whereby, the display stand may be elevated or lowered proportionally less than the work surface, when they are moved.

[0044] Figure 11 is an architectural view of the workstation according to an embodiment. The workstation includes an exercise apparatus and a work surface according any of the various embodiments described herein. The work surface has a drive system 1102 for driving the work surface to different heights from the floor and/or for driving the platform to different distances from the work surface. The drive system of the work surface may drive only a portion of the work surface, for example a display stand according to Figure 10a and 10b. On the other hand a workstation may comprise several parts including the display stand, and each of the part may be driven to different heights by the drive system.

[0045] The exercise apparatus has a drive system 1104 for driving the exercise apparatus such that it offers resistance to the movement of the user operating the exercise apparatus.

[0046] The drive systems may have electrical motors, whose rotation is transferred into movement of the work surface, platform, display stand and/or the exercise apparatus.

[0047] A controller 1106 is connected to the drive systems for controlling their operations. One or more sensors 1108, 1110, 1112 are connected to the controller for obtaining information for controlling the drive systems. A memory 1114 is connected to the controller for storage of data and/or instructions. The controller, memory, drive systems and sensors are electrically connected e.g. by electrical wiring, such that signals and data may be communicated to and/or from the controller.

[0048] The controller may be implemented by a central processing unit (CPU). The CPU may comprise a set of registers, an arithmetic logic unit, and a control unit. The control unit is controlled by a sequence of program in-

structions transferred to the CPU from the memory. The control unit may contain a number of microinstructions for basic operations. The implementation of microinstructions may vary, depending on the CPU design. The program instructions may be coded by a programming language, which may be a high-level programming language, such as C, Java, etc., or a low-level programming language, such as a machine language, or an assembler. The memory may be a volatile or a non-volatile memory, for example EEPROM, ROM, PROM, RAM, DRAM, SRAM, firmware, programmable logic, etc. The memory and the controller may be connected by an electrical connection provided e.g. by a printed circuit board, where the memory and the controller are installed.

[0049] In the architecture of the workstation, the controller and memory may be provided by a general purpose computer or an embedded system that is connected to the sensors and drive systems. The general purpose computer may further have a network interface providing connectivity to a Local Area Network or a mobile communications system. The network interface may be provided by a network adapter connectable to a Universal Serial Bus connection, or a Network Interface Card, e.g. an Ethernet card. Various embodiments described herein may be implemented according to the architecture of Figure 11.

[0050] Figures 12a and 12b illustrate operation of a treadmill 1202 in a workstation 1200 according to an embodiment. The workstation may be the workstation in Figures 1 a to 1 d, where the treadmill is installed as the exercise apparatus. The treadmill is positioned under a work surface 1204 and the treadmill extends away from the work surface such that a user may be positioned on the treadmill next to the work surface for working on the work surface in upright and/or seated position. In Figure 12a, a position of the treadmill is illustrated, where the treadmill forms a single surface aligned with the horizontal level, H_{level}. The horizontal level may be defined by a floor for example. In Figure 12b, a position of the treadmill is illustrated, where the treadmill is inclined at angle α to the horizontal level H_{level} in Figure 12a. The inclination is upwards, such that the end of the treadmill in the running or walking direction is higher than the opposite end of the treadmill. Accordingly, the treadmill is in a position for a user positioned on the treadmill to experience an uphill, when the user is running of walking.

[0051] The workstation may be moved between the positions of the treadmill illustrated in Figures 12a and 12b on the basis of input obtained from one or more sensors of the workstation, when the workstation is implemented according to the architecture of Figure 11. In an embodiment, the workstation may determine a position of the platform 1206. If the platform is positioned at a distance x from the work surface such that the user may work on the work surface in a seated position, the treadmill may be driven to the uphill position of Figure 12b. Accordingly, in this way the treadmill may be used as a footrest during seated work in the workstation. The foot rest position may be for example a maximum climb position of the treadmill. Figure 12a may illustrate a starting point, where the platform has been moved to the distance x for seated working and Figure 12b may illustrate the position of the treadmill after the treadmill is driven on the basis of the position of the platform.

[0052] On the other hand, if the platform is positioned at a distance from the work surface such that the user may work on the work surface in an upright position, the treadmill may be driven from the position of Figure 12b to the position of Figure 12a. In this way the position of the treadmill may be adapted to a training program of the treadmill, e.g. training programs: cardio work out, calorie burn and hill climb. On the other hand, even if no training programs were used, horizontal position allows a natural standing position for the user next to the work surface.

[0053] Figures 13a and 13b illustrate structural arrangements of parts of the workstation according to an embodiment. The workstation comprises an exercise apparatus 1302, work surface 1304 and drive system 1306 of the exercise apparatus. In Figure 13a, the workstation is illustrated by a three dimensional view from an elevated position behind the exercise apparatus. In Figure 13b the workstation is illustrated by a view from above showing the arrangement of the parts inside a housing 1308 of the workstation below the work surface. The work surface and housing are illustrated by dashed lines.

[0054] The drive system of the exercise apparatus is capable of driving the exercise apparatus such that it offers resistance to the movement of the user operating the exercise apparatus. In the structural arrangement, the drive system is located next to the portion, e.g. a belt of a treadmill, of the exercise apparatus that operates against the user.

[0055] The drive system may be located within the housing that covers the drive system from dust and tampering. The housing may be formed by panels on the sides of the exercise apparatus. Tee panels may form the side surfaces illustrated in Figure 6. The positioning of the drive system provides that the space in the front part of the treadmill is not elevated higher than the level of the treadmill belt that is part of the treadmill, where the user walks. Placing the drive system on the side parts of the workstation leaves empty the leg space of the worker who in sitting position will position his/her legs to the frontal part of the treadmill.

[0056] The drive system connects to the exercise apparatus via mechanical connection such that a driving force is transferred from the drive system to the exercise apparatus for driving the exercise apparatus. In one example the exercise apparatus is a treadmill and the drive system drives the treadmill. The mechanical connection between the drive system and the treadmill drives a belt of the treadmill, for example by driving an axis that rotates the belt. The structural arrangement of the drive system next to the exercise apparatus facilitates keeping the height of the exercise apparatus low as measured from the floor.

[0057] Also further parts of the workstation may be located around, e.g. next to the exercise apparatus. Examples of these parts include a control unit 1310 of the drive system that may connect electrically to the drive system for adjusting the speed of the treadmill by electrical command signals to the drive system. Similar to the drive system, the control unit may be located in the same or separate housing 1308.

[0058] The work surface may be supported to the housing accommodating the drive system and/or the control unit. The structural arrangement of the drive system and the control unit of the exercise apparatus to the sides of the exercise apparatus allows utilizing the area under the work surface more efficiently.

[0059] Figure 14 illustrates examples of measurements performed by sensors of the workstation according to an embodiment. The workstation may follow the architecture of Figure 11. The sensors may be positioned to locations indicated in the Figure 14. Dashes lines illustrate different positions of the work surface, display stand, seat and the platform.

[0060] The measurements may comprise one or more of a group comprising: vertical height of the work surface 1400, operation of the exercise apparatus 1410, position of the platform 1420 with respect to the work surface, user positioned on/off the exercise apparatus1430, platform on/off the exercise apparatus 1440, seat type detection 1450, user weight and/or vital functions 1460, platform position 1470, brake open/closed 1480, display stand height 1490, time seated on the seat, time the exercise apparatus has been used, time stood in the workstation.

[0061] The exercise apparatus may be a treadmill, whereby a measurement of operation of the exercise apparatus may be used to determine, whether the treadmill is operated or not. The treadmill is operated, when the belt of the treadmill is running. On the other hand if the speed of the belt is zero, it may be determined that the treadmill is not operated. A suitable sensor may be a sensor for the speed of the belt. It should be appreciated that the speed of the belt may not need a separate sensor, but the speed may be obtained from the treadmill, for example via an electrical connection to a controller unit of the treadmill. The treadmill may have one or more sensors for measuring the belt speed, heart rate and/or inclination of the belt. Accordingly, measurements of the sensors of the treadmill may be obtained to be used in driving one or more parts of the workstation, e.g. the platform, work surface and/or display stand, between different positions.

[0062] The vertical height of the work surface, display stand height, position of the platform with respect to the work surface, user position on/off the exercise apparatus, platform on/off the exercise apparatus, brake open/closed an display stand height may be determined by sensors, whose activation indicates that a condition is met regarding the measurement. The sensor may be a switch that connects an electrical circuit upon a condition being met. The condition may be a height, weight or position of a structure. The condition may be set for the sensor by installing the sensor to a location in the workstation and the sensor may be activated by a movement a part of the workstation to the location or the user touching the location.

[0063] For example, the position of the platform on the exercise apparatus may be measured by two sensors positioned on the exercise apparatus at different distances from the work surface. When rails are used in the workstation for moving the platform, the sensors may be installed to rails. Then, when the platform arrives at the location of the sensors, the position of the platform may be detected by the activation of the sensor. In a similar manner the position of the platform that is movable on the exercise apparatus without rails may be determined by positioning the sensors on the path of movement of the platform.

[0064] In another example position of the user may be determined by a sensor that is activated by the user stepping on the exercise apparatus. Such a sensor may be a pressure sensor for example.

[0065] In another example the presence of the platform on the exercise apparatus may be determined by a sensor installed to the rails, when the rails are used for moving the platform in the workstation. On the other hand, when rails are not used for moving the platform, the presence of the platform on the exercise apparatus may be determined by installing the sensor on the path of movement of the platform. Sensor for determining the position of the platform on the exercise apparatus with respect to the work surface may be used to determine whether the platform is positioned on the exercise apparatus. When the sensors are not activated, it may be determined that the platform is off the exercise apparatus.

[0066] In another example the user weight may be determined by a digital scale. The scale may be positioned under the exercise apparatus, for example.

[0067] In another example vital functions of the user may comprise a heart rate or blood pressure. The heart rate may be measured by handles that are conventional in present treadmills. The handles may be installed to the work surface reachable to the user.

[0068] Various sensors suitable for measurements in the workstation comprise light sensors that are activated by changes in illumination conditions, pressure sensors and switches.

[0069] Figure 15 illustrates implementation of the workstation according to an embodiment. The workstation may follow the architecture of Figure 11. Now referring to the architecture of Figure 11, the controller 1106 may be integrated within the work surface 1502 or attached below the work surface. The integration may be preferred since this leaves the work surface unobstructed by the controller both from its top and bottom surfaces.

[0070] An interface unit may be provided at the foot 1506 of the supports 1504 of the work surface. The interface unit may be located in the housing that accom-

modates the drive system or the control unit of the exercise apparatus, illustrated in Figures 13a and 13b. The interface unit may include connectors to the electric mains, a communications network. The communications network may be a mobile communications network, a Wide Area Network or a Local Area Network (LAN), for example an IEEE 802.11 based Wireless LAN. Examples of the mobile communications networks comprise the Global System for Mobile Communications (GSM), General Packet Radio Service (GPRS) and their developments that are currently in commercial use. A web server may be connected to the interface unit. The web server may be co-located with the interface unit or the controller. The controller and the interface unit may be electrically connected for transmission of data and/or electrical power.

[0071] Figure 16 illustrates location of the control unit 1602 in a work surface 1604 according to an embodiment. The control unit may be the controller in the architecture of Figure 11. The work surface may be implemented in the workstation of Figure 15. The control unit is preferably located on one side of the work surface, where the user is seated or standing, when he/she is working on the work surface.

[0072] Figure 17a and 18a illustrate movement of the seat 1702, 1802 in a platform 1704, 1804 according to an embodiment. The movement is provided in a direction d_w of the edge of the work surface 1706, 1806. The edge may be the edge that is closest to the platform. The direction is illustrated by arrows. The dashed lines shows the area and positions, where the seat may be moved from a starting position of the seat illustrated in black. In the starting position the seat at a shortest distance from the work surface. This distance may be defined by the position of the on the exercise apparatus, when the platform is moved on rails of wheels to that position, e.g. by following the path of movement provided by rails or wheels, when the platform is on the exercise apparatus according to the illustration of Figures 3, 4 or 5.

[0073] In Figure 17a, the movement is a rotational movement around a center point defined by the platform. The rotational movement takes place in a plane formed by the top surface of the work surface. The rotational movement moves the seat away from the work surface and to a new position in the direction of the edge of the work surface as the seat is rotated away from the starting position.

[0074] In figure 18a, the movement of the seat takes place on a straight path. The path that is perpendicular to the path of movement of the platform to different distances described in various embodiments herein.

[0075] Figures 17b, 18b and 18c illustrate structures of platforms having a movable seat. Figure 17b illustrates a structure that provides the movement of the seat in the area illustrated in Figure 17a. The platform includes a stand 1708 that is connected to support structures 1710. The support structures extend horizontally and towards the floor 1712. Various embodiments described herein illustrate examples of support structures. The stand includes an arm 1714 that extends vertically and horizontally away from the stand. The stand may be rotatable around a vertical axis such that the seat positioned at an end of the arm remote from the stand may be moved according to the illustration of Figure 17a.

[0076] The arm may be connected to the stand such that the arm is rotatable around a horizontal axis 1716. The connection of the arm to the stand allows movement of the seat to different heights for seated work or working in an upright position that are illustrated in Figures 1 a to 1 d.

[0077] Figure 18b illustrates a structure of the platform for movement illustrated in Figure 18a. The structure is viewed from above. The platform includes one or more rails 1810 that are arranged to extend in the direction that is perpendicular to the path of movement of the platform to different distances from the work surface. A stand 1808 for a seat may be mounted to be movable on the rails. In this way the seat attached to the stand may be moved according to the illustration of Figure 18a. Support structures 1812 of the platform extend towards the sides of the exercise apparatus for connecting to rails and/or wheels as illustrated in Figures 3 to 5. The support structure provides support against the flipping of the platform by movement of the seat on the rails.

[0078] Figure 18c is a vertical cross-section of the platform of Figure 18b, where the rails and stand mounted on the rails is shown. The cross-section is viewed in the direction of movement provided by the rails. The rails are formed by parallel grooves having an upturned V-shaped cross-section.

[0079] An embodiment is a process for a workstation according to an embodiment. The process may be performed by the workstation that follows the architecture of Figure 11, for example. The process determines current positions of the exercise apparatus, the platform, display stand and/or the work surface in the workstation, e.g. the workstation in Figures 12a and 12. Changes in the current positions are determined for controlling the positions of the exercise apparatus, display stand and/or the work surface. The workstation may drive the exercise apparatus, display stand and/or the work surface to different positions, e.g. to different heights. In the flowing, the process is described in a workstation, where the exercise apparatus is a treadmill. However, also other exercise apparatuses are viable. In the process the position of the treadmill is controlled. However, instead or additionally, the work surface height and/or the display stand height may be controlled.

[0080] The process is now described referring now to the workstation in Figures 12a and 12b and the process in Figure 19. The process starts 1902, when the workstation is operational and capable of measuring positions of the platform and the treadmill. The workstation maybe connected to the electric mains or other source of electrical power for powering the operations described in the process. One or more sensors may be installed to the

workstation for performing at least part of the measurements according to the illustration and description of Figure 14.

[0081] In 1904 a current position of the platform is determined. The position of the platform may comprise a distance from the work surface as illustrated in Figures 1a to 1d. Accordingly, it may be determined, whether the platform is actually on or off the exercise apparatus. And if the platform is determined to be on the exercise apparatus, the position may be determined more accurately with respect to the work surface.

[0082] In 1906 a current position of the treadmill is determined. The treadmill may have an inclined position with respect to the horizontal level or the treadmill may be aligned with the horizontal level. The different positions are described in more detail above with reference to Figures 12a and 12b.

[0083] In 1908 movement of the platform may be determined. The movement may be determined by one or more sensors that detect a change in the position of the platform with respect to the work surface. The changed position may be a changed distance to the work surface, e.g. the platform may have been moved towards or away from the work surface, and even off the exercise apparatus.

[0084] In 1910, a next position of the treadmill is determined on the basis of the movement of the platform. If 1912 the next position of the treadmill is the same as the current position, the treadmill position is not changed and the process may end 1916. The current position and the next position may be the same e.g. when the platform is not moved.

[0085] If 1912 the next position of the treadmill is different than the current position, the treadmill may be driven 1914 to the next position. The treadmill may be driven by the controller of the workstation sending a control signal over an electrical connection to the treadmill control unit. The control signal may be an electrical signal and cause the drive system of the treadmill to incline the treadmill between an uphill, downhill, and/or level ground positions.

[0086] In 1916, the process ends after the position of the treadmill is determined after measuring movement of the platform.

[0087] It should be appreciated that in the process of Figure 19, instead or additionally to the exercise apparatus, e.g. the treadmill, also the display stand, platform and/or the work surface may be driven to different positions that are illustrated in various embodiments herein. Although the driving has been described in Figure 19 to be performed on the basis of movement of the platform, it should be appreciated that movement or a change of operating mode of any part of the workstation, for example the exercise apparatus, display stand, platform and/or the work surface, may be used to determine that one or more of the other parts of the workstation should be driven to a new position or an operating mode.

[0088] Figure 20 illustrates various working positions of the workstation according to an embodiment. The working positions may comprise positions P1, P2, P3, P4 and P5 that represent corresponding states of the workstation. Each of the working positions is defined by a set of two or more parameters comprising positions and operating mode of the parts of the workstation. The parts of the workstation may include a work surface, a display stand, a platform and an exercise apparatus. The workstation and its parts may be configured according to the various embodiments described herein such that various working positions are provided. In the illustration of Figure 20, the work surface may have at least two positions ws1 and ws2, the display stand may have at least two positions ds1 and ds2, the platform may have at least two positions p1 and p2, and the exercise apparatus may have three operating modes m1, m2 and m3.

[0089] Figure 21 illustrates transitions between working positions according to an embodiment. The working positions are illustrated as states P1 to P5 according to Figure 20. Transitions between the states are illustrated as connections between the states. The connections illustrate the states that are closest to each other, when the distance between states is measured by the number of parameters that are different. Accordingly, the states that are the most similar in terms of their parameters are connected. For example, for state P1, P2 is the closest state, and for P4, the states P3 and P5 are the closest.

[0090] In an embodiment, the process of Figure 19 illustrates changing the states of the workstation, wherein the states are defined by the working positions. P1 to P5. The positions P1 to P5 may correspond to working in a seated position, a half-standing position, standing, walking and running, respectively. The working positions may be as described in Figure 20. Transitions between the states may be as described in in Figure 21. Accordingly, movement of the platform from position p1 to p2 indicates a change of the state of the workstation from a current state P1 to a next state that has the platform in the position p2. Following the table of Figure 20 and the state transitions in Figure 21, the next state is P4, that has the platform in the position p2. In state P4, the exercise apparatus, e.g. a treadmill, has operating mode m2, whereas in state P1, the operating mode is m1. After the next state is determined as P4, the exercise apparatus is driven to the new operating mode m2 that may be also a new position, e.g. uphill or downhill position of the treadmill belt. Also the work surface and display stand may be driven to their new positions defined by the state P4.

[0091] The process for changing the states of the workstation according to Figure 19 may start in 1902, when the workstation is operational and capable of measuring positions and/or operating mode of the platform, work surface, display stand and/or the exercise apparatus.

[0092] In steps 1904 and 1906 the current state of the workstation may be determined. The determining may be performed on the basis of information obtained from one or more sensors installed to the workstation. The state may be any one of the states P1 to P5 for example.

The current state of the workstation comprises at least two parameters, e.g. two or more from ws1, ds1, p1 and m1. Operating modes of the exercise apparatus e.g. a treadmill, may comprise one or more positions. Examples of the positions comprise positions of the belt of the treadmill in uphill or downhill direction. The positions ws1, ds1 and p1 may indicate positions of the work surface, platform and display stand as described in various embodiments herein.

[0093] In 1908, the movement of parts of the workstation or a change of the operation mode is determined. The determining may be performed on the basis of information obtained from one or more sensors installed to the workstation. Information may be received from sensors connected directly to a controller and/or from sensors in the exercise apparatus. For example the belt speed may be received from a treadmill as described above in connection with Figure 14.

[0094] In 1910, a next state of the workstation may be determined. The information received from the sensors may comprise a position or operating mode of the work surface, platform, display stand or the exercise apparatus. The received information may be used to update the parameters of the current state. When the updated parameters match to the current state the current state is not changed and the process may end in 1916. When the updated parameters do not match to the current state, the next state of the work station is different than the current state and the process proceeds to 1914, where the workstation may be driven to the next position. One or more parts of the workstation, the platform, display stand and the exercise apparatus may be driven. Driving of the parts may be caused by the controller of the workstation sending an electrical control signal to the drive system connected to each part.

[0095] In 1916, the process ends after the state of the workstation has been controlled.

[0096] The next state may be the state that is directly indicated by the updated parameters of the current state. On the other hand the next state may be the state that is indirectly indicated by the updated parameters of the current state. In one example of directly indicating the next state, referring now to Figure 20, the current state may be P1 that is defined by parameters of the work surface at position ws1, the display stand at position ds1, the platform at position p1 and the operating mode of the exercise apparatus m1. The received information from the sensors may indicate that the position of the work surface is changed to ws2. The received information may be used to updated the parameters and arrive at parameters ws2, ds1, p1, m1 which match to the parameters of state P2 and thereby directly indicate the state P2 for the workstation. In one example of indirectly indicating the next state, referring again to Figure 20, the current position may be P1 similar to the above example. However, the received information from the sensors may indicate that the position of the platform is changed to p2. The received information may be used to update the parameters of P1 and arrive at parameters ws1, ds1, p2, m1 which indirectly indicate states P4 and P5, since those are the only states that have the platform in the position p2. The next state is then determined as the state that has the smallest distance from the current state P1. Following the state transition in Figure 21, the state P4 is only three state transitions away from the current state, whereas P5 is four state transitions away, and state P4 is determined as the next state. It is possible to limit the possible state transitions e.g. based on the distance between the states. The distance between the states may be determined based on a state transition graph as illustrated by Figure 21 or based on a number of common parameters between the updated parameters and states of the workstation.

[0097] It should be appreciated that the exact determining of the position of the platform may not be necessary, but a mere movement of the platform may be used to determine, whether the treadmill, work surface and/or display stand should be driven from their current position.

[0098] An embodiment provides a process by a workstation according to an embodiment, where movement of the work surface is determined and used to control an operative state of the exercise apparatus, e.g. treadmill. The process may be started as explained above with Figure 19. The current position of the work surface may be determined. On the other hand it may be sufficient to determine only the movement and the new height following the movement of the work surface. Accordingly, the movement of the work surface comprises a change of the height of the work surface. When the height of the work surface is changed as a consequence of the movement of the work surface the new height of the work surface maybe used for switching an operative state of the treadmill. The treadmill may be controlled by the workstation as described in Figure 19. The operative states of the treadmill may comprise belt running and belt not running. Accordingly, when the work surface is moved to a lower height from the floor, the operative state of the treadmill may be changed to belt not running, wherein the belt is stopped. In this way the workstation can be adapted to a seated working position next to the work surface, where treadmill cannot be used. On the other hand, increasing the height of the work surface from the floor may be used to switch the operative state of the treadmill to bell running, whereby the belt may start running at a predefined speed, e.g. at walking pace.

[0099] Figure 22 illustrates a process for measuring performance in a workstation according to an embodiment. The workstation may be implemented according to the architecture of Figure 11. The process starts 2202, when the workstation is operational and capable of measuring positions and/or operating mode of the platform, work surface, display stand, and/or the exercise apparatus. Additionally, the workstation has a timer functionality for measuring time in one or more working positions of the workstation. The timer may be provided by a clock in the controller of the workstation. The working positions

may be described by states as explained above e.g. in Figure 20.

[0100] In 2204, the current working position of the workstation may be determined. This may be performed as described in steps 1904 and 1906 of Figure 19 above.

[0101] In 2206, time spent in the working position maybe measured. The measurement may start, after the workstation has been moved to the working position, for example after the workstation has been driven to the new position in step 1914 of Figure 19.

[0102] In 2208, the measured time may be shared to the person working in the workstation, to other workstations and/or to an external server. The measured time may be displayed to the person via a display. The display may be arranged on the work surface and connected electrically to the controller of the workstation. The connection between the display and the controller may be a VGA (Video Graphics Array) or HDMI (High-Definition Multimedia Interface) connection, for example. The connection to the other workstations or to the external server may be provided by a communications network, e.g. the Internet. The external server may be executing a web service that hosts one or more web pages. The received time may be embedded to a web page that is retrievable on the server. The access to the web page may be limited to the person working in the workstation or the access maybe allowed to a group of persons. The web server may host a social networking service, e.g. the Facebook, where the web page is retrievable as part of the social networking service.

[0103] The external server may receive information of time spent in working positions from one or more workstations according to an embodiment. The server may process the information received from the workstations and generate aggregate data on the basis of the received information. The aggregate data may indicate an aggregate performance of all the workstations. The performance may be defined in calories, duration of the exercise, etc. The aggregate information may be embedded to a web page generated by the server to be retrievable to the workstations according to access rights, similar to the time information received from a single workstation described above.

[0104] The process ends 2210 after the measured time has been shared.

[0105] The sharing of the measured information allows also feedback to the person using the workstation and may comprise a recommendation of changing his/her working position.

[0106] The working position may comprise a working position, where the person in the workstation is operating an exercise apparatus. Such a working position maybe the working positions P4 and P5 in Figure 20 for example. When the exercise apparatus is in the working position, various measurements illustrated in Figure 14 as associated description may be performed to obtain further performance data in addition to the time spent in the working position. The performance data may comprise, time spent in a working position, calories burned, heart rate, etc. The calories burned may be estimated on the basis of the weight of the person and heart rate and further parameters that may be measured by sensors and/or obtained from the user via a user interface, as is conventional in present treadmills for example.

[0107] In an embodiment, a workstation according to the architecture of Figure 11, or a part of the workstation, in particular a CPU, may send and receive data from one or more other workstation units that may comprise a platform for a seat, a work surface, an exercise apparatus, a display stand, an interface unit and a web server which are described in various embodiments herein. In this way, when a person starts operating an exercise apparatus in a working position, the workstation may obtain information e.g. by using sensors, that the user is on the exercise apparatus and/or the exercise apparatus is being used, and send information of the commencement of the exercise and/ or performance of the exercise to the web server, to a display or directly to other workstations. The exercise apparatus may be a treadmill, whereby the person walking on the exercise apparatus may be determined. In this manner a worker in the workstation or a third party may follow how many workstations in a certain network are currently walking/or paused and collect aggregate data of the usage of the treadmill networks.

[0108] An embodiment provides a computer program embodied on a distribution medium, for example a non-transitory computer readable storage medium, comprising program instructions which, when loaded into an electronic apparatus, cause the controller to perform a method according to an embodiment.

[0109] The computer program may be in source code form, object code form, or in some intermediate form, and it may be stored in some sort of carrier, which may be any entity or device capable of carrying the program. Such carriers include a record medium, computer memory, read-only memory, electrical carrier signal, telecommunications signal, and software distribution package, for example. Depending on the processing power needed, the computer program may be executed in a single electronic digital computer or processor or it may be distributed amongst a number of computers or processors.

[0110] The techniques described herein may be implemented by various means so that an workstation implementing one or more functions described with an embodiment comprises not only prior art means, but also means for determining a movement of the platform on the exercise apparatus to different distances from the work surface on at least one straightforward path of movement and, wherein at said distances the same portion of the work surface is towards the user positioned for working at the work surface, said distances comprising at least one distance defining a position of the platform with respect to the work surface for operating the exercise apparatus and at least one position of the platform with respect to the work surface, where the user is seated, and driving the work surface or the exercise apparatus to a

different position on the basis of the determined movement.

[0111] More precisely, the various means comprise means for implementing functionality of a corresponding workstation described with an embodiment and it may comprise separate means for each separate function, or means may be configured to perform two or more functions. For example, these techniques may be implemented in hardware (one or more apparatuses), firmware (one or more apparatuses), software (one or more modules), or combinations thereof. For a firmware or software, implementation can be through modules (e.g., procedures, functions, and so on) that perform the functions described herein. The software codes may be stored in any suitable, processor/computer-readable data storage medium(s) or memory unit(s) or article(s) of manufacture and executed by one or more processors/computers. The data storage medium or the memory unit may be implemented within the processor/computer or external to the processor/computer, in which case it can be communicatively coupled to the processor/computer via various means as is known in the art.

[0112] It will be obvious to a person skilled in the art that, as the technology advances, the inventive concept can be implemented in various ways. The invention and its embodiments are not limited to the examples described above but may vary within the scope of the claims.

Claims

1. A workstation (500), comprising:

a work surface (506) supported at a height above a floor (512) and

an exercise apparatus (508) supported on the floor (512) next to the work surface (506) such that a user operating the exercise apparatus (508) is in a position for working on the work surface (506), said exercise apparatus (508) extending on the floor (512) away from the work surface (506), and

a platform (502) for a seat, said platform (502) including means (504) for moving the platform (502) with respect to the work surface (506),

wherein the workstation (500) is adapted to receive the means (504) for moving the platform (502) such that the platform (502) is movable on the exercise apparatus (508) to different distances from the work surface (506) on at least one straightforward path of movement and, wherein at said distances the same portion of the work surface (506) is towards the user positioned for working at the work surface (506), **characterized by** said distances comprising at least one distance defining a position of the platform (502) with respect to the work surface (506) for operating the exercise apparatus (508) and at least one position of the platform (502) with respect to the work surface (506), where the user is seated.

2. A workstation (500) according to claim 1, wherein the means (504) for moving the platform (502) has support structures that extend vertically and horizontally below the seat such that the exercise apparatus (508) fits below the support structures and the seat, when the platform (502) is received by the workstation (500).

3. A workstation (500) according to claim 1 or 2, wherein the workstation comprises a break arrangement that prevents the platform (502) from moving with respect to the work surface (506).

4. A workstation (500) according to any one of the preceding claims, wherein the exercise apparatus (508) comprises a drive system for driving the exercise apparatus (508) supported on the floor (512) such that the exercise apparatus (508) offers resistance to the movement of the user operating the exercise apparatus (508); and the drive system is arranged next to a portion of the exercise apparatus (508) operating against the user.

5. A workstation (500) according to any one of the preceding claims, including a controller integrated within the work surface (506) and an interface unit for connecting to electric mains and to a communications network at the foot of support structures of the work surface (506), and the controller and the interface unit are electrically connected for transmission of data and electrical power.

6. A workstation (500), according to any one of the preceding claims wherein the platform (502) is configured for movement of the seat in a direction of the edge of the work surface (506), said edge being the edge closest to the platform (502).

7. A workstation (500), according to any one of the preceding claims wherein the workstation (500) comprises side surfaces located on opposite sides of the exercise apparatus (508) for extending the width of the exercise apparatus (508) in the direction of width of the work surface (506), wherein the side surfaces and the exercise apparatus (508) form a substantially uniform surface.

8. A workstation (500) according to claim 6 or 7, wherein the platform (502) defines a center point of rotational movement around a vertical axis and the platform (502) comprises an arm for the seat, said arm extending vertically and horizontally away from the stand.

9. A workstation (500) according to claim 8, wherein the arm is connected to the stand such that the arm is rotatable around a horizontal axis.

10. A workstation (500) according to any one of the preceding claims, wherein the exercise apparatus (508) comprises a treadmill.

11. A workstation (500) according to any one of the preceding claims comprising at least one sensor for detecting a movement of the platform (502), a drive system for driving the work surface (506), a display stand and/or the platform to different positions, for example a height above the floor (512), and a controller operatively connected to the sensor, the work surface (506) and the drive system and the controller is configured to cause the workstation (500) to:

determine a movement of the platform (502);
drive the work surface (506), the display stand and/or the platform between different positions, for example a height above the floor (512), on the basis of the determined movement.

12. A workstation (500) according to any one of the preceding claims comprising a sensor for detecting a movement of the work surface (506) and a controller operatively connected to the sensor and the exercise apparatus (508), the work surface (506) and the exercise apparatus (508) and the controller is configured to cause the workstation (500) to:

determine a change of height of the work surface (506);
switch operative state of the exercise apparatus on the basis of the determined change of the height.

13. A method for a workstation (500) comprising
a work surface (506),
an exercise apparatus (508) supported on the floor (512) next to the work surface (506) such that a user operating the exercise apparatus (508) is in a position for working on the work surface (506),
a platform (502) for a seat,
a drive system for driving the work surface (506) to different heights above the floor (512),
one or more sensors installed to locations in the workstation (500) for measuring movement of the platform (502), and
a controller operatively connected to the sensors and drive system, and arranged to cause the method that is **characterized by** comprising:

determine a movement of the platform (502) on the exercise apparatus (508) to different distances from the work surface (506) on at least one straightforward path of movement and, wherein at said distances the same portion of the work surface (506) is towards the user positioned for working at the work surface (506), said distances comprising at least one distance defining a position of the platform (502) with respect to the work surface (506) for operating the exercise apparatus (508) and at least one position of the platform (502) with respect to the work surface (506), where the user is seated.

14. A method according to claim 13, wherein the workstation (500) comprises one or more sensors for measuring performance of the user in a working position, the method comprising:

determining a working position of the user;
measuring performance of the user in the working position;
sharing the measured performance to the user, other workstations and/or a social networking service.

15. A computer program product **characterized by** comprising executable code that when executed, cause execution of functions of a method according to claim 13 or 14.

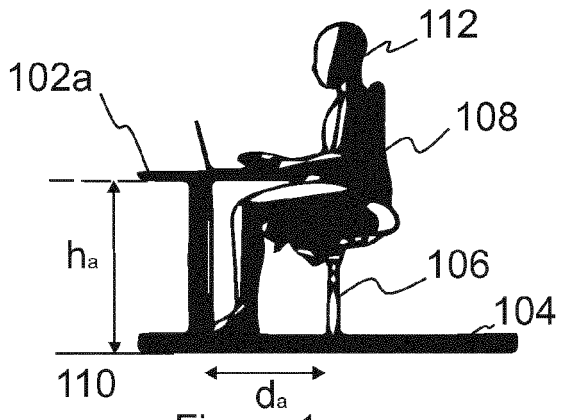

Figure 1a

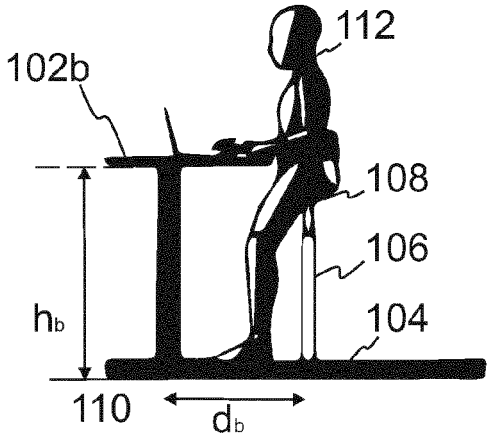

Figure 1b

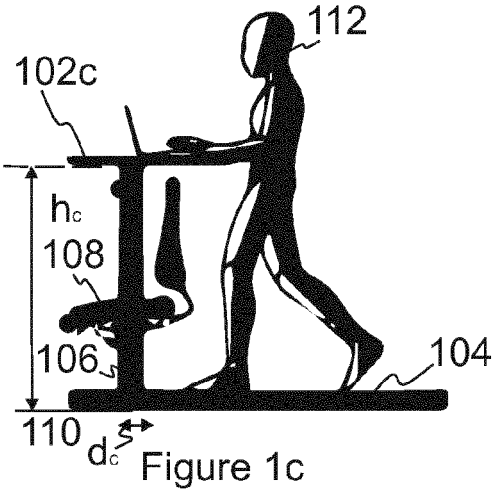

Figure 1c

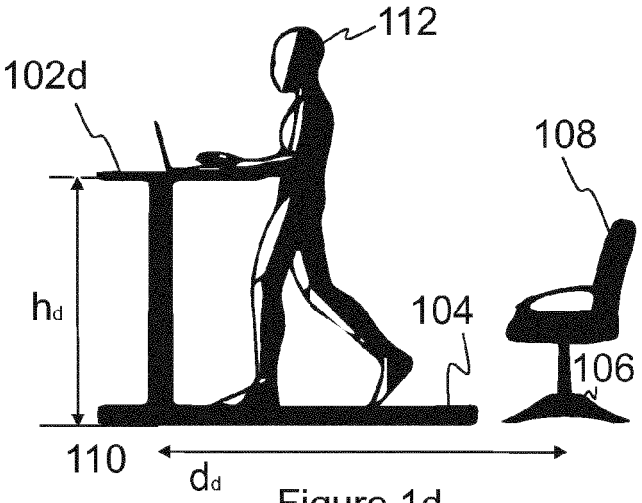

Figure 1d

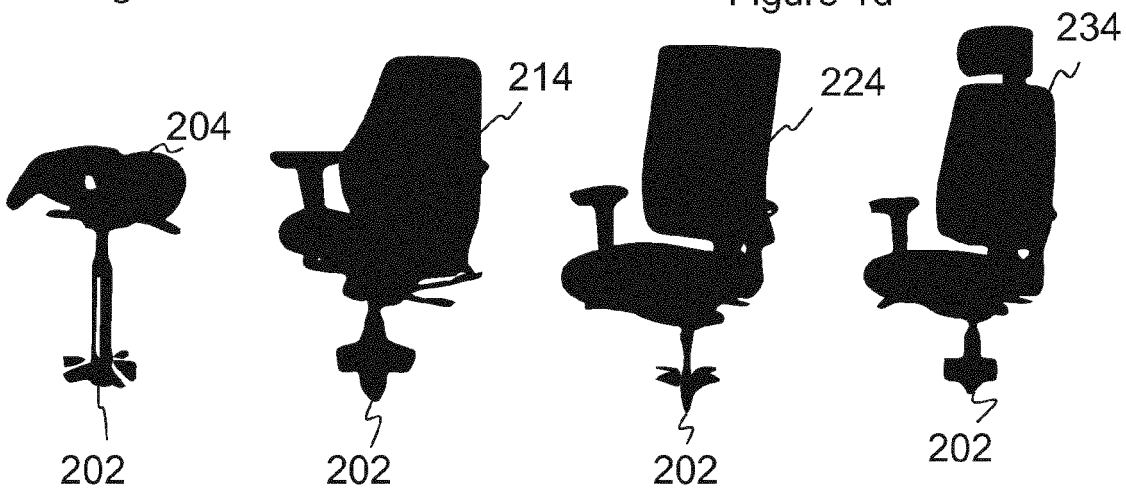

Figure 2

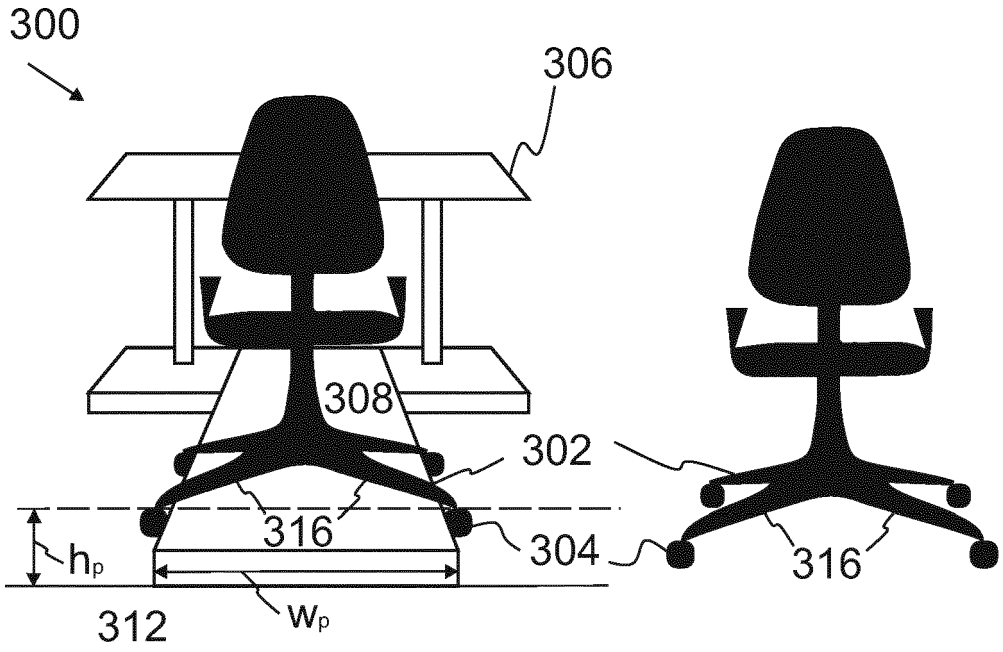

Figure 3

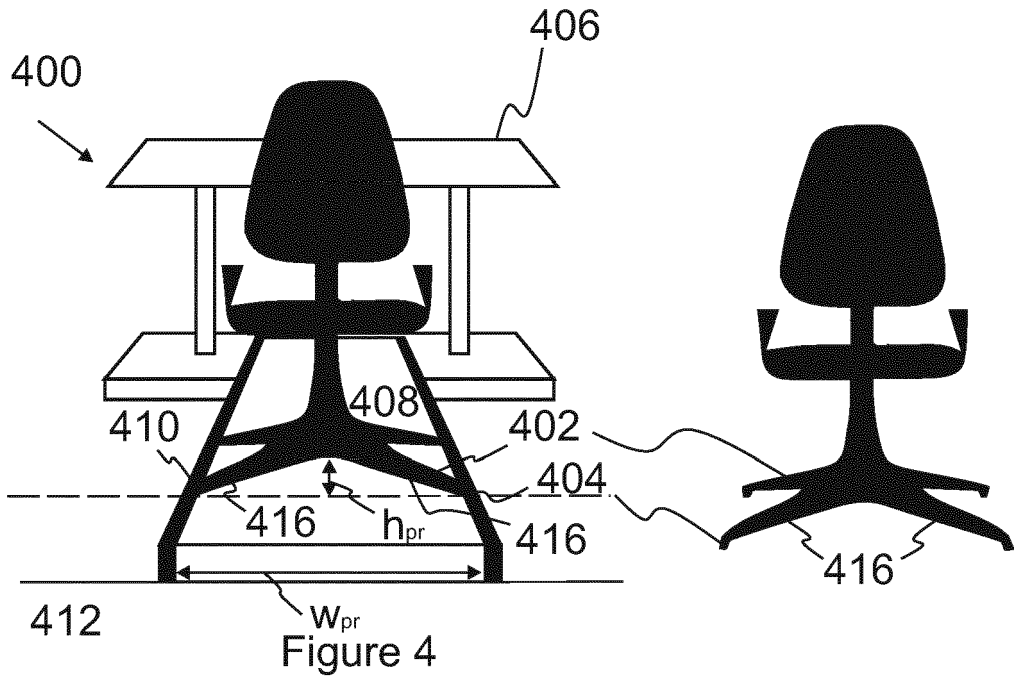

Figure 4

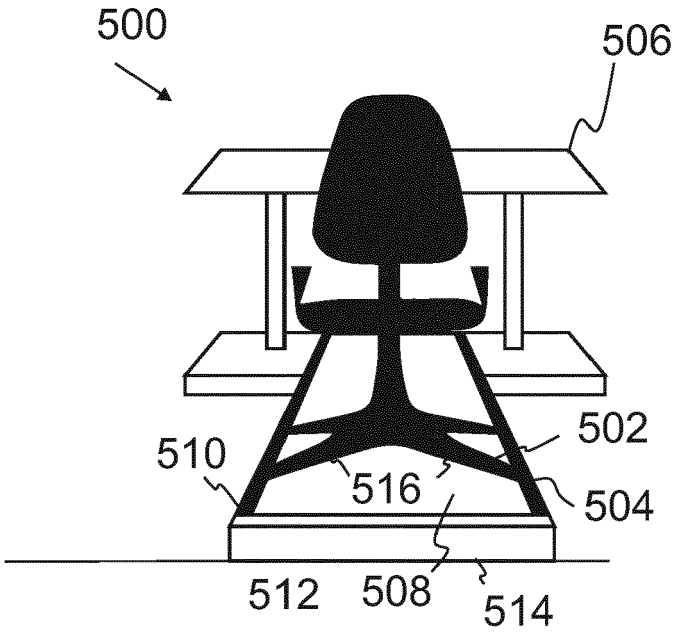

Figure 5

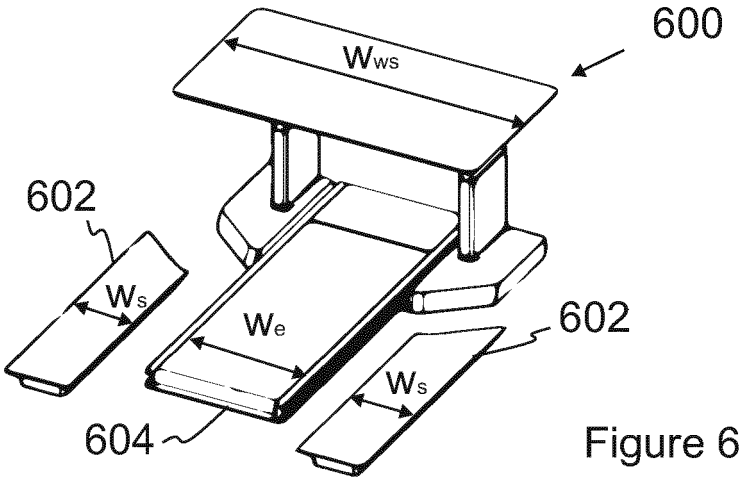

Figure 6

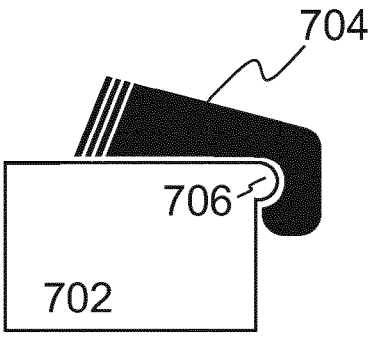

Figure 7a

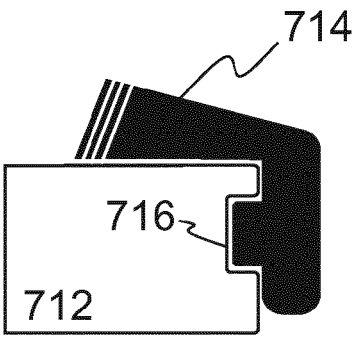

Figure 7b

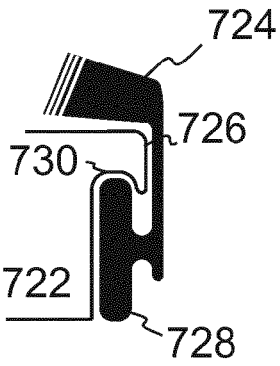

Figure 7c

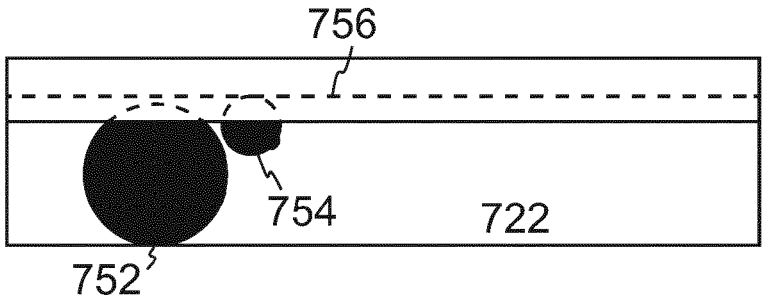

Figure 7d

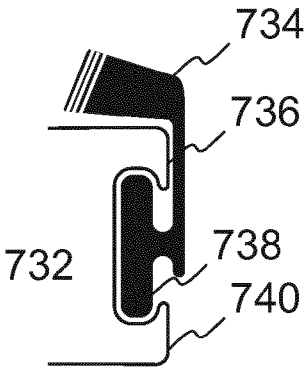

Figure 7e

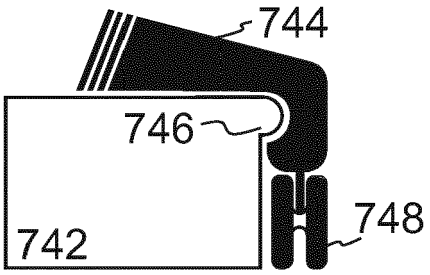

Figure 7f

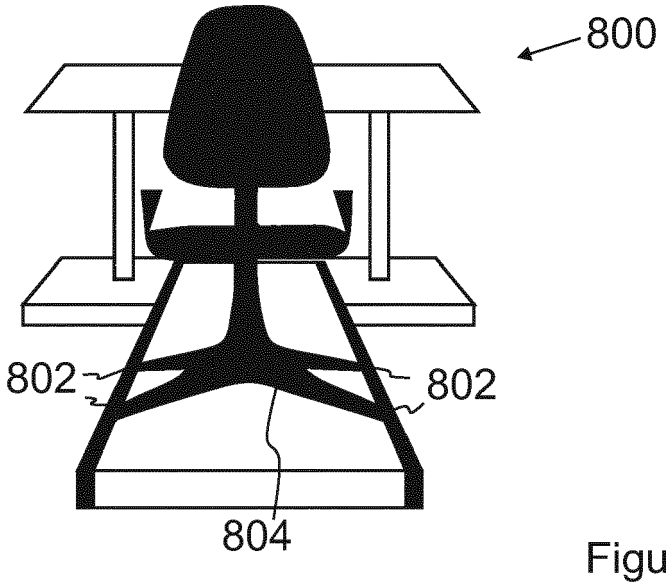

Figure 8

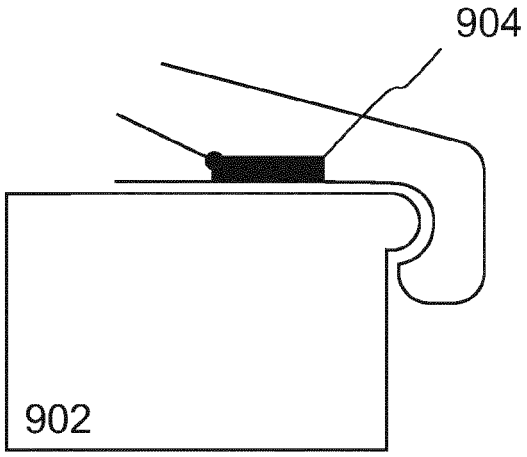

Figure 9a

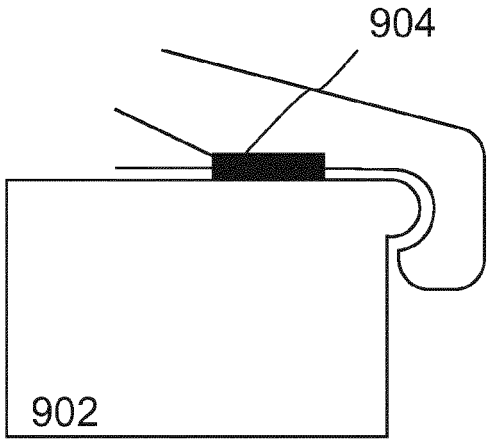

Figure 9b

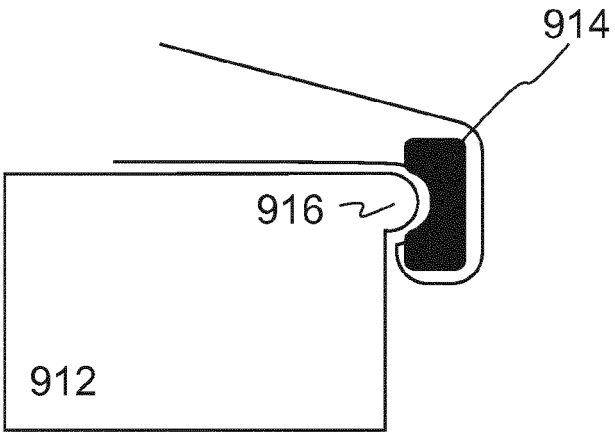

Figure 9c

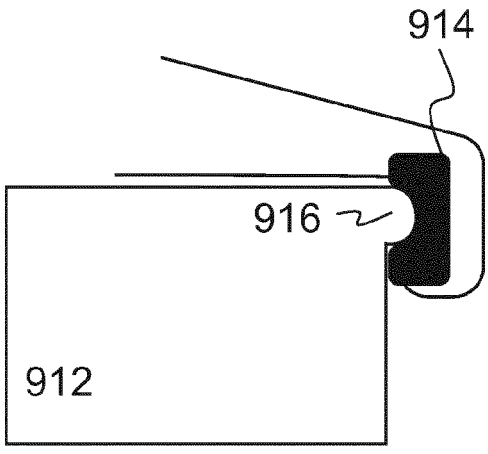

Figure 9d

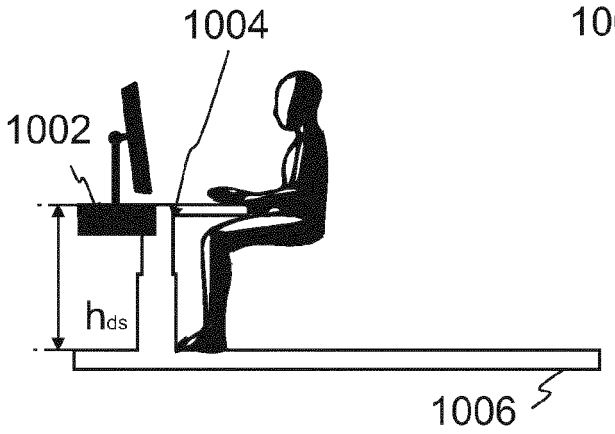

Figure 10a

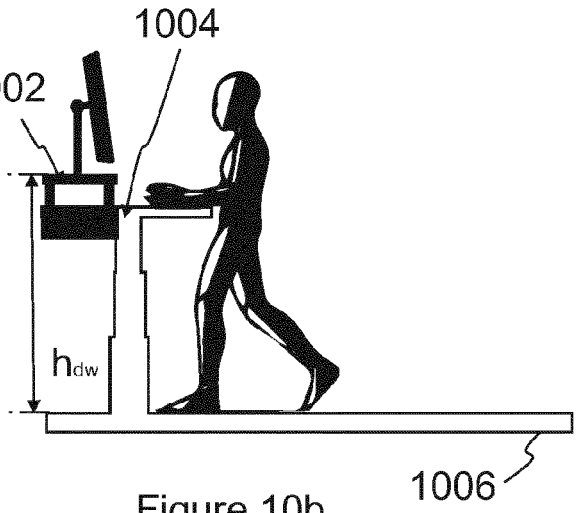

Figure 10b

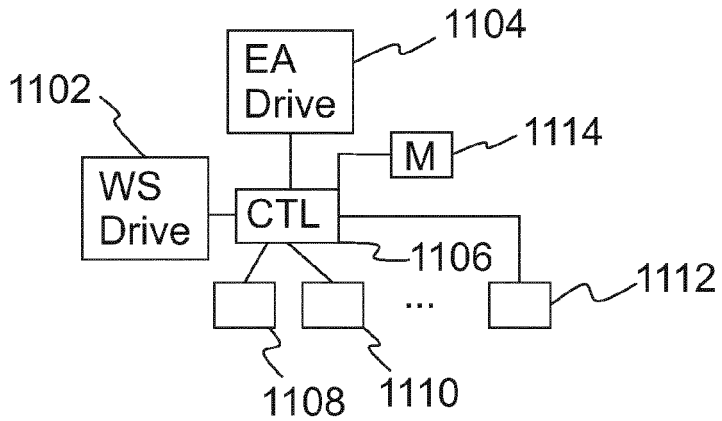

Figure 11

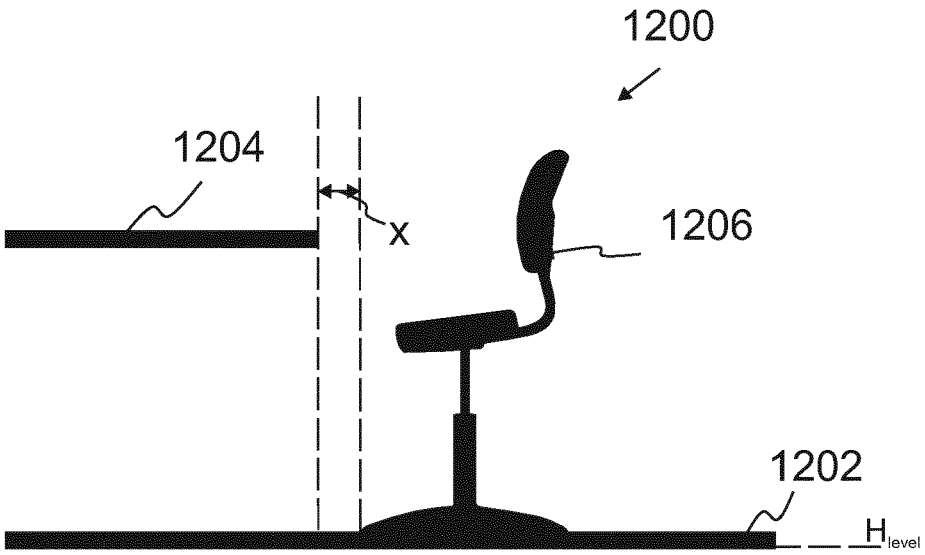

Figure 12a

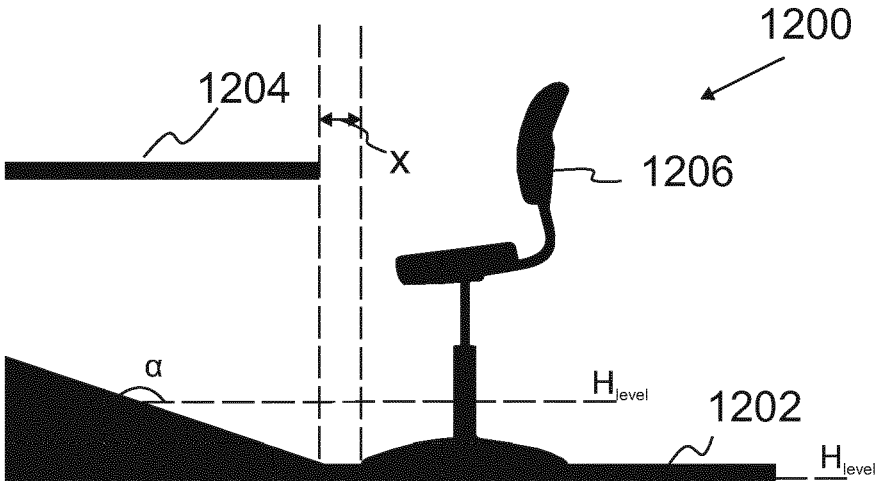

Figure 12b

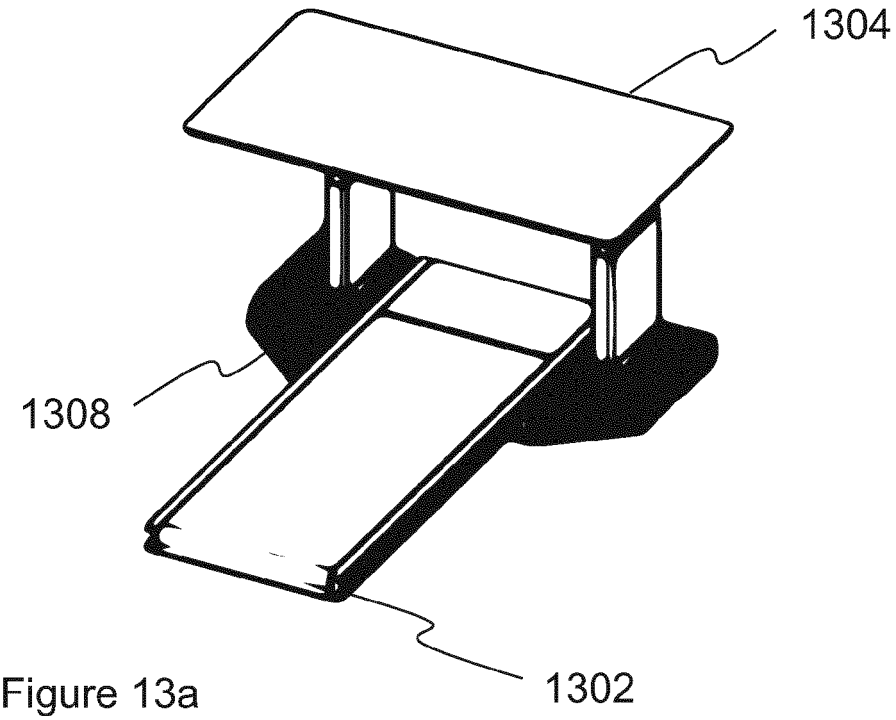

Figure 13a

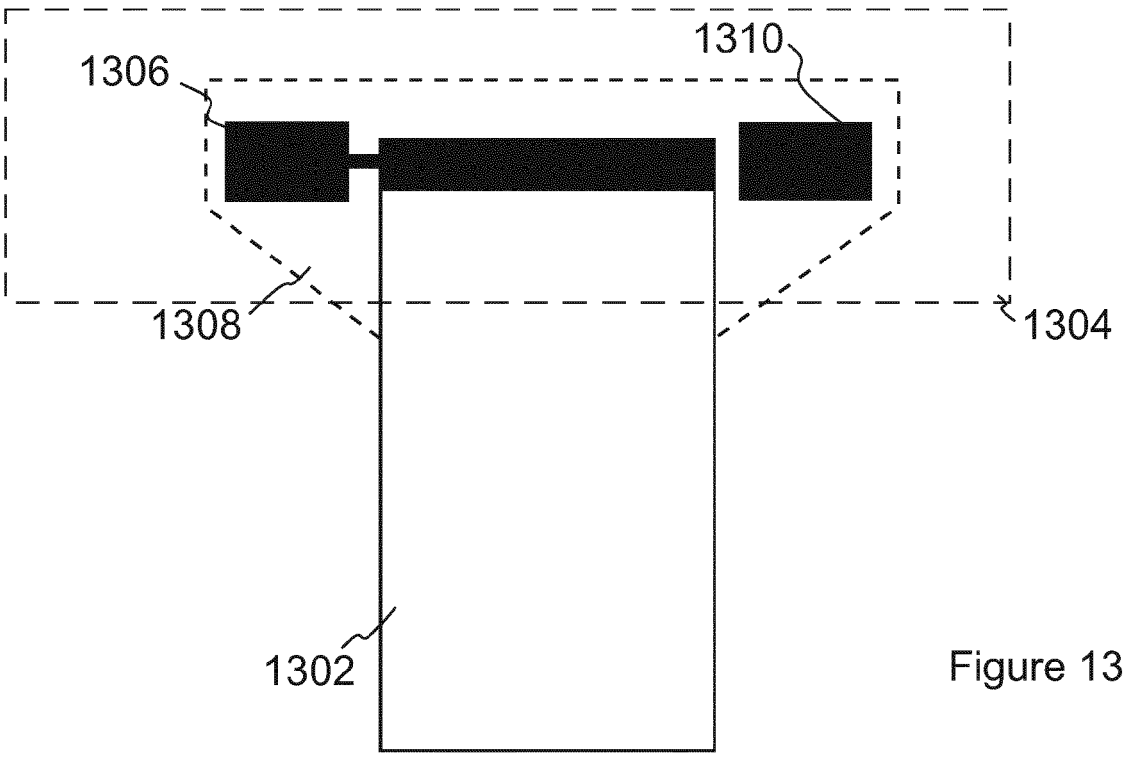

Figure 13b

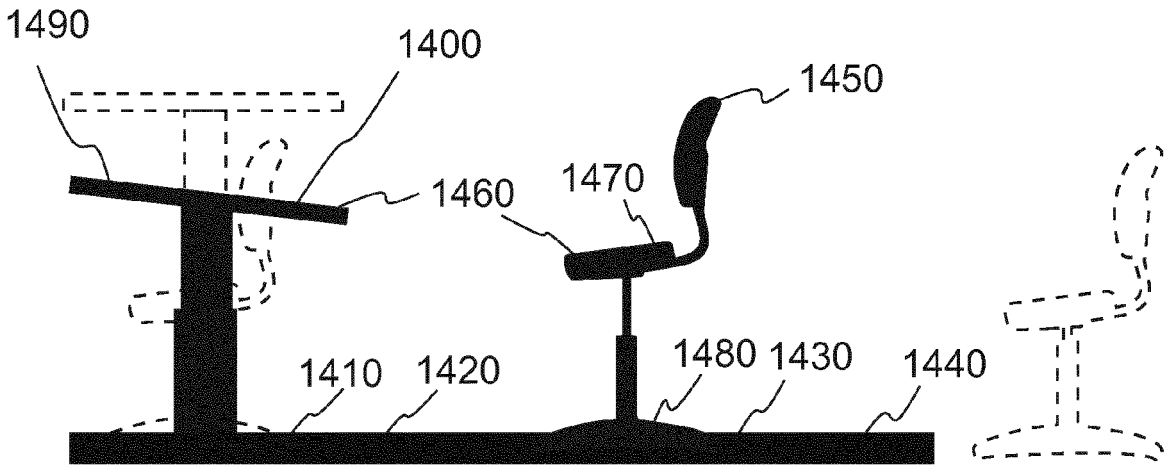

Figure 14

Figure 15

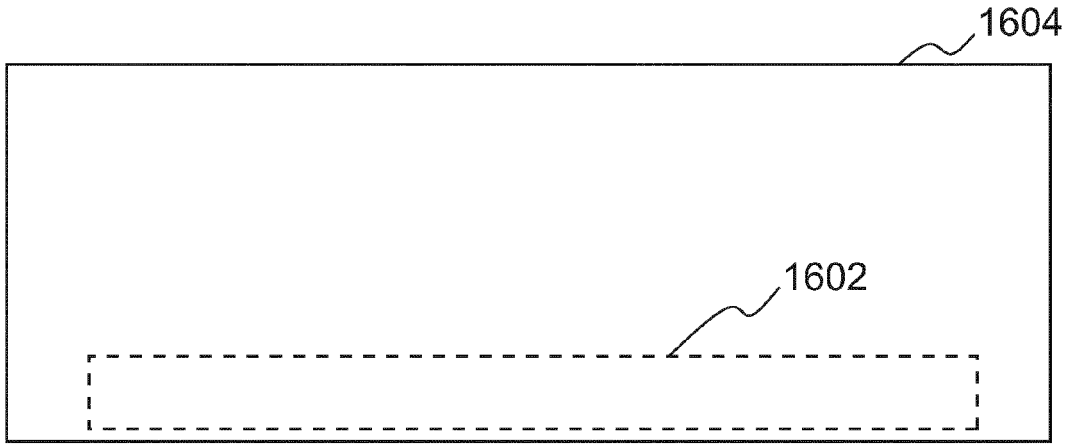

Figure 16

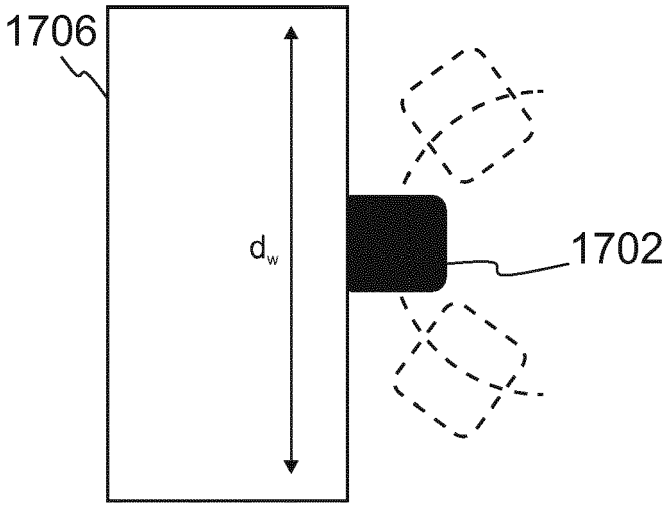

Figure 17a

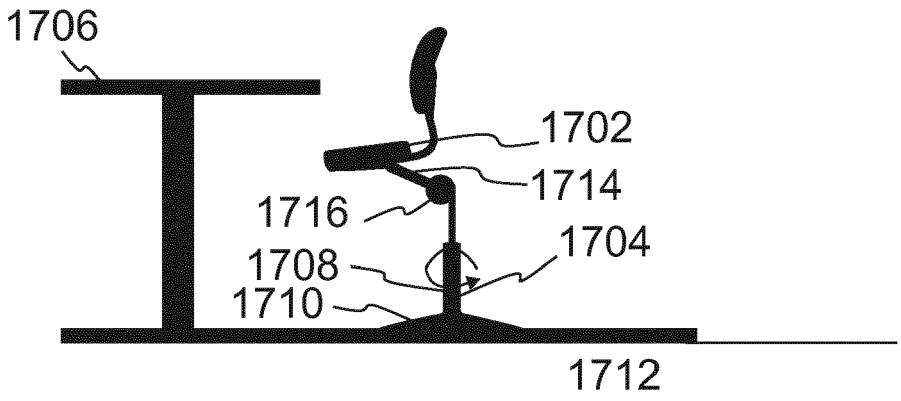

Figure 17b

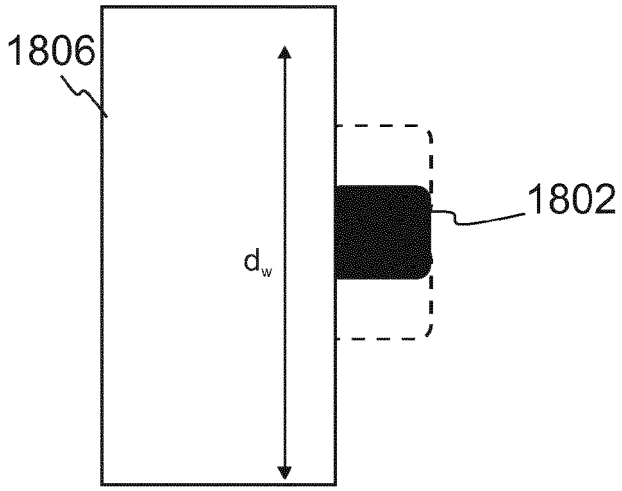

Figure 18a

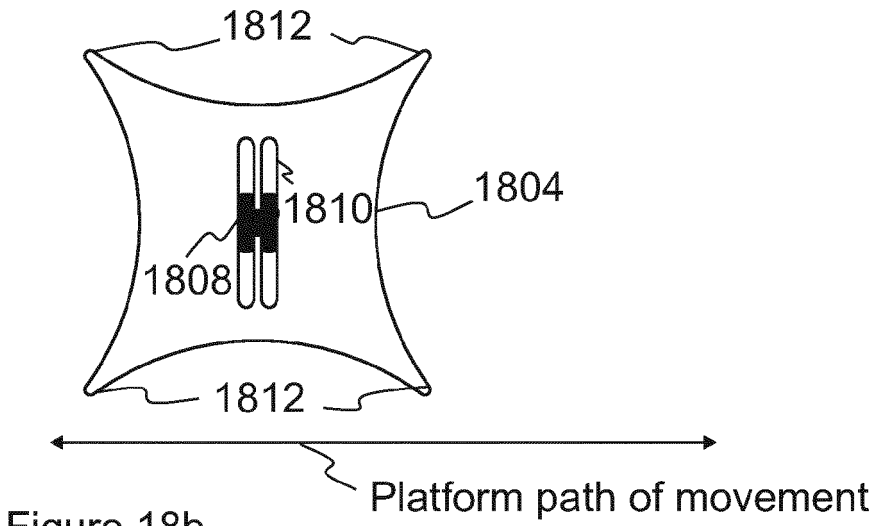

Figure 18b

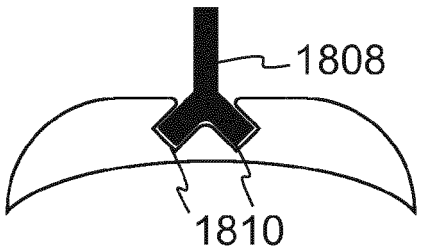

Figure 18c

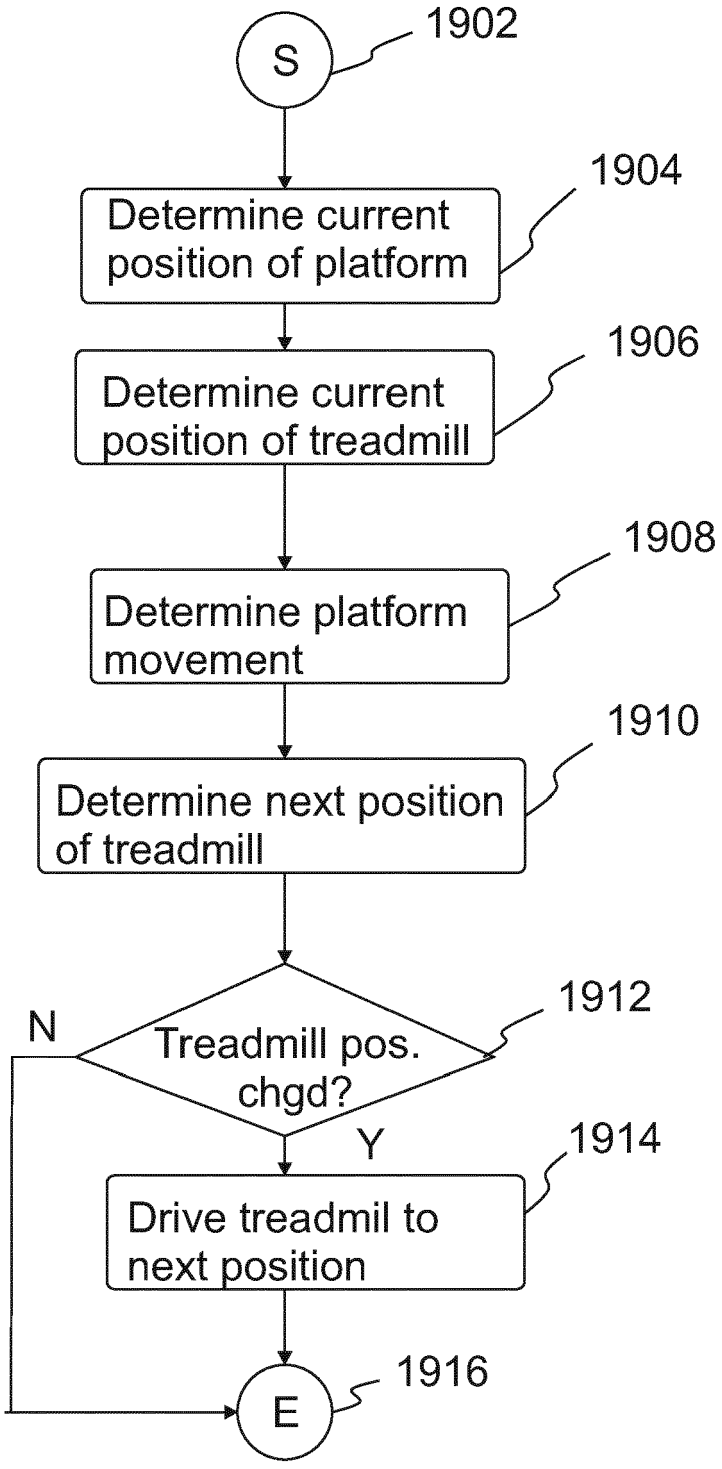
S
1902
Determine current position of platform
1904
Determine current position of treadmill
1906
Determine platform movement
1908
Determine next position of treadmill
1910
Treadmill pos. chgd?
1912
N
Y
Drive treadmil to next position
1914
E
1916

Figure 19

	Positions			Operating mode	
Working position	Work Surface	Display stand	Platform	Exercise apparatus	
P1	ws1	ds1	p1	m1	
P2	ws2	ds1	p1	m1	
P3	ws2	ds2	p1	m1	
P4	ws2	ds2	p2	m2	
P5	ws2	ds2	p2	m3	

Figure 20

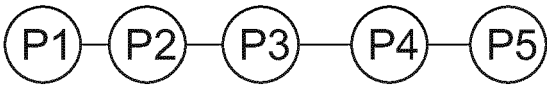

Figure 21

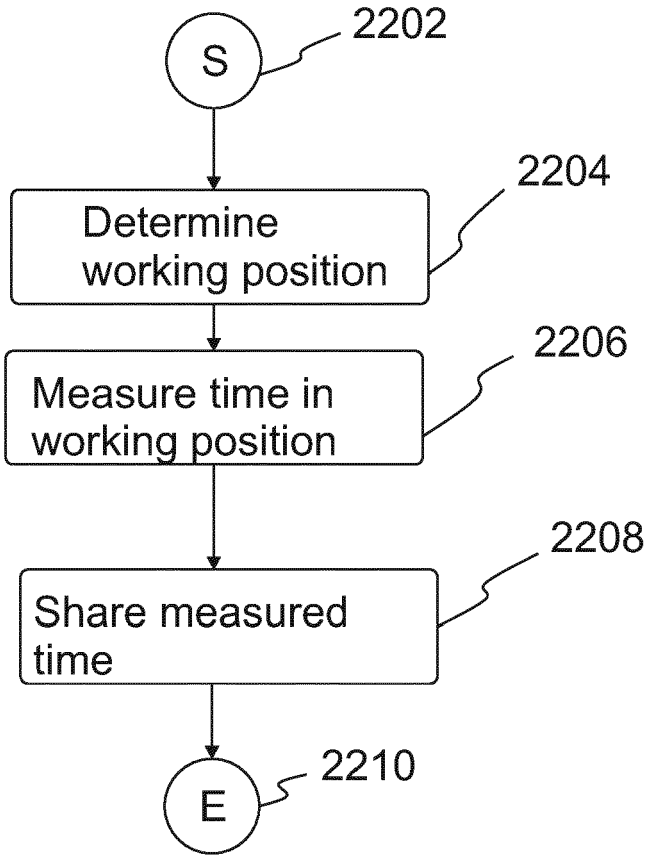

Figure 22

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European Patent Office
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EUROPEAN SEARCH REPORT

Application Number
EP 15 15 7389

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X A	US 2011/237396 A1 (LU ZHENYU [US]) 29 September 2011 (2011-09-29) * paragraph [0031] - paragraph [0032] * * figure 6 *	1-10 11-15	INV. A47B9/20 A63B22/02
X	WO 2012/177919 A2 (UNIV UTAH RES FOUND [US]; MARTIN JAMES CHARLES [US]) 27 December 2012 (2012-12-27) * page 12, line 1 - line 24 * * figure 1 *	1-7	
A	DE 20 2012 012433 U1 (SCHWEER FLORIAN [DE]) 17 January 2013 (2013-01-17) * paragraph [0016] * * figures 1,6,7 *	1,13	
A,D	US 2006/247109 A1 (POWELL STEVEN D [US]) 2 November 2006 (2006-11-02) * the whole document *	1,13	

TECHNICAL FIELDS SEARCHED (IPC)
A47B
A63B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	20 July 2015	Bitton, Alexandre

CATEGORY OF CITED DOCUMENTS

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EPO FORM 1503 03.82 (P04C01)

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20-07-2015

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2011237396 A1	29-09-2011	NONE	
WO 2012177919 A2	27-12-2012	US 2014187383 A1	03-07-2014
		WO 2012177919 A2	27-12-2012
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US 2006247109 A1	02-11-2006	NONE	

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- US 20060247109 A **[0004]**