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(54) **ADJUSTABLE VERTICAL DESK**

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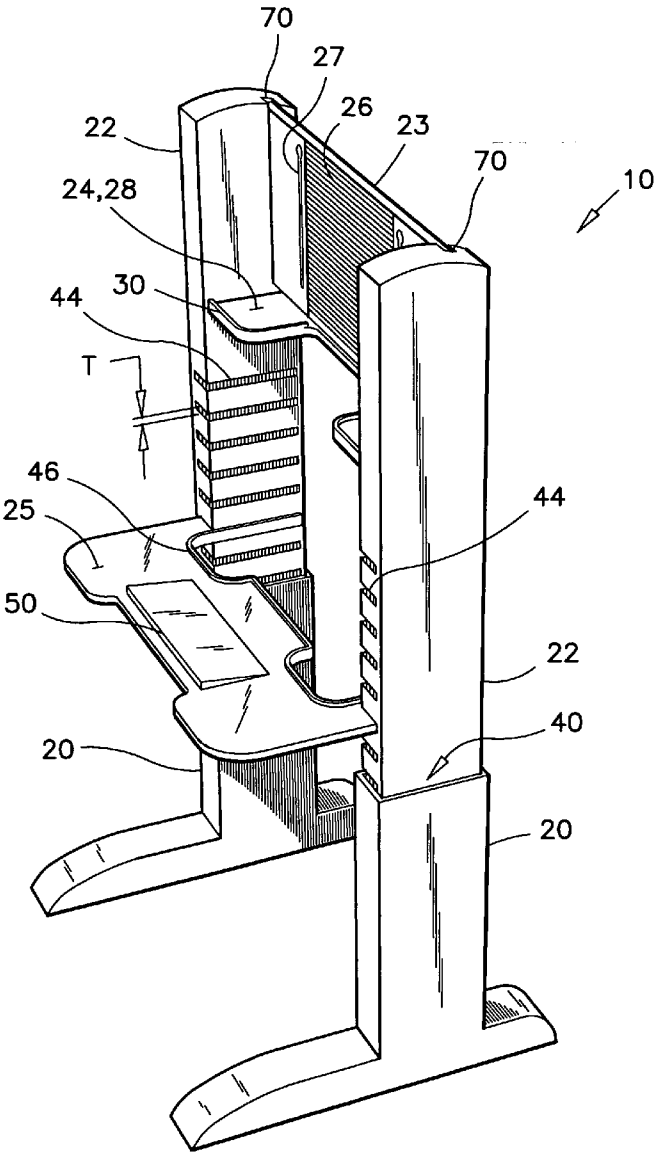
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(57) **ABSTRACT**

An adjustable, vertical desk with a horizontal work surface and vertical display surface upon which is attached a computer monitor or other electronic equipment to be viewed, in a range of height positions appropriate to adults of varying heights. The horizontal work surface may also be adjusted to position a keyboard and a mouse at an appropriate hand level for adults of varying heights. The desk allows users to place electronic equipment to heights as needed to suit their stature and by so doing encourages more natural body alignment while in a standing or in a seated position. When the vertical desk is used in combination with a standard treadmill set at low speed, the vertical desk permits mild exercise without work interruption.



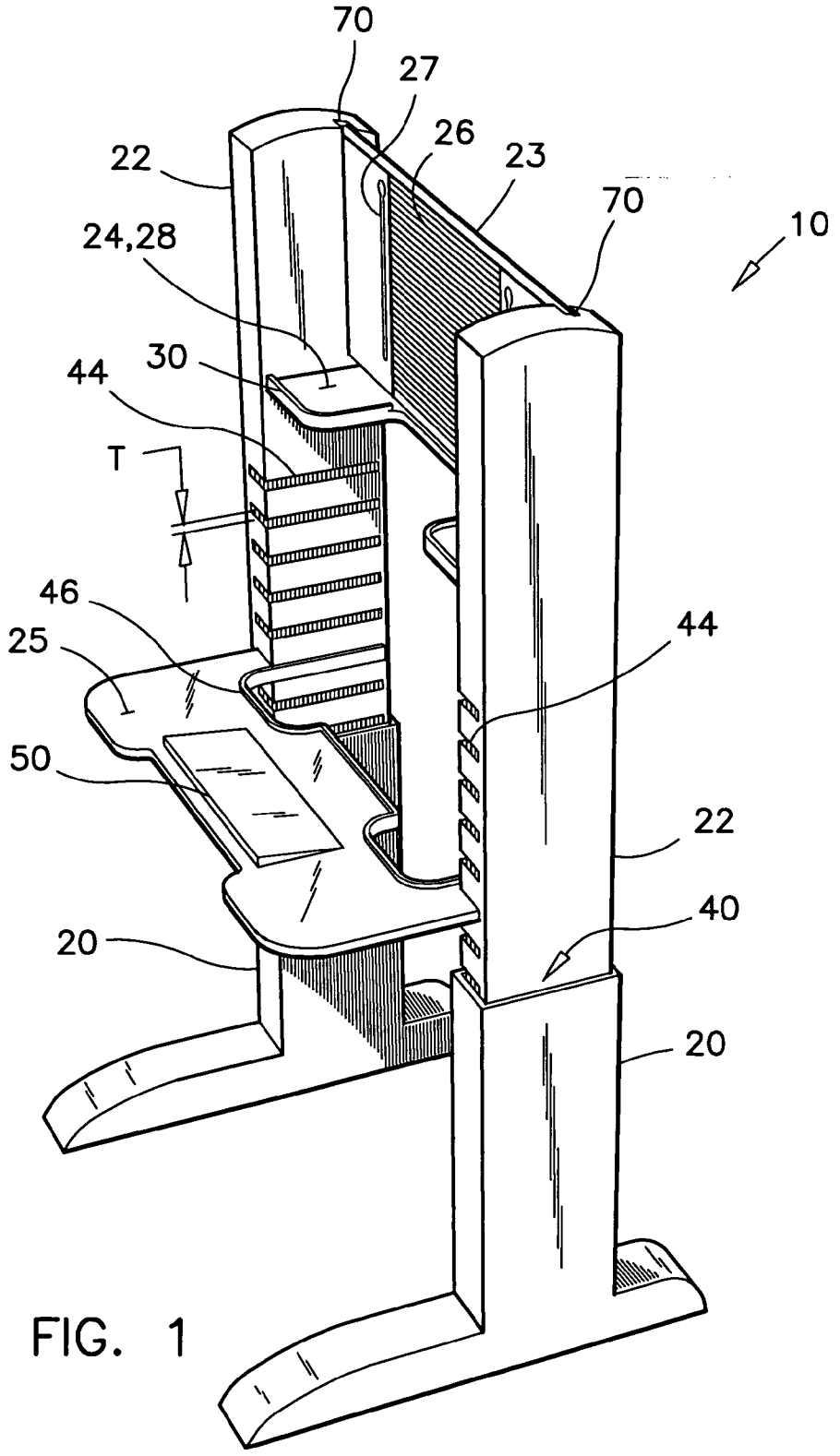


FIG. 1

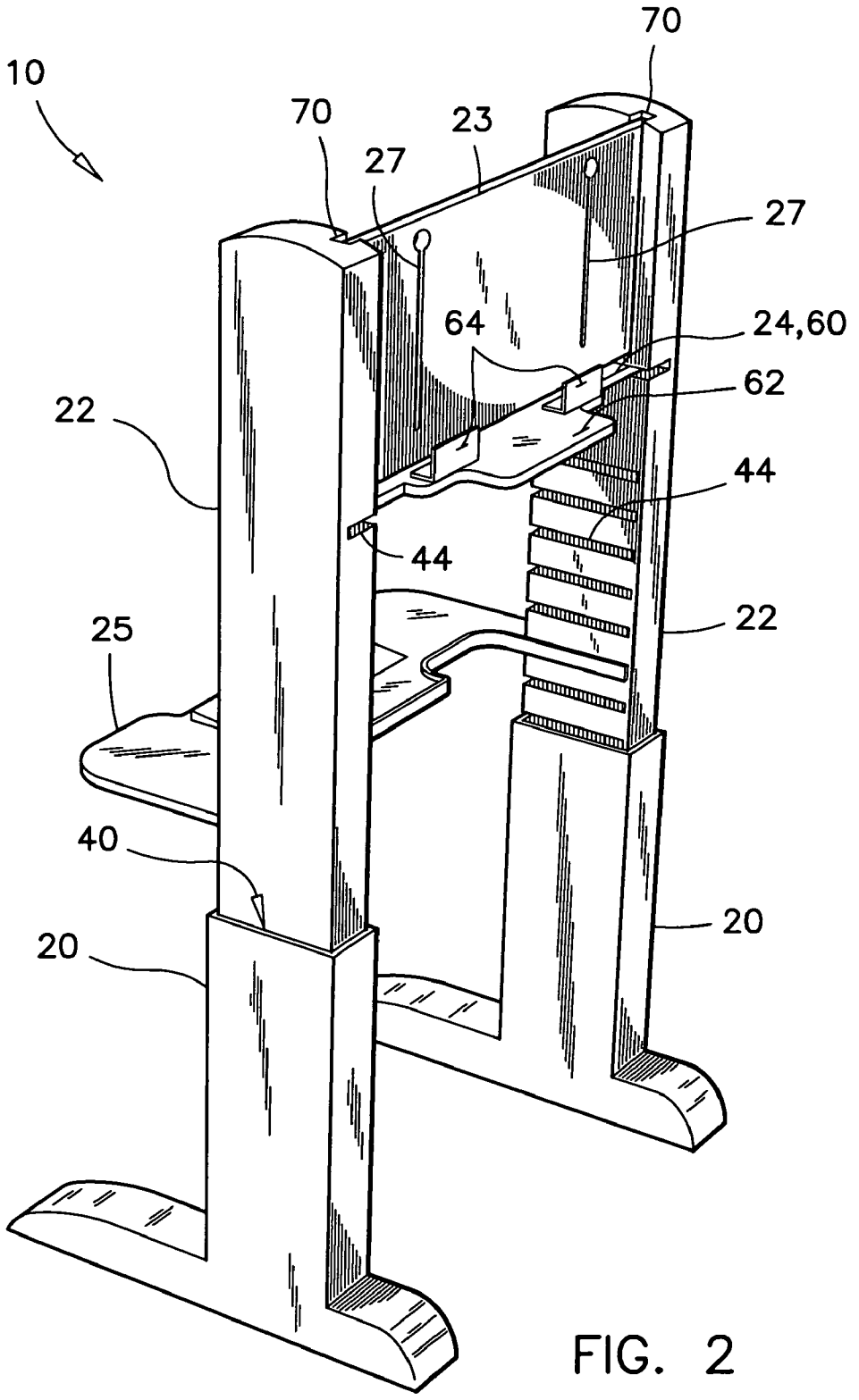


FIG. 2

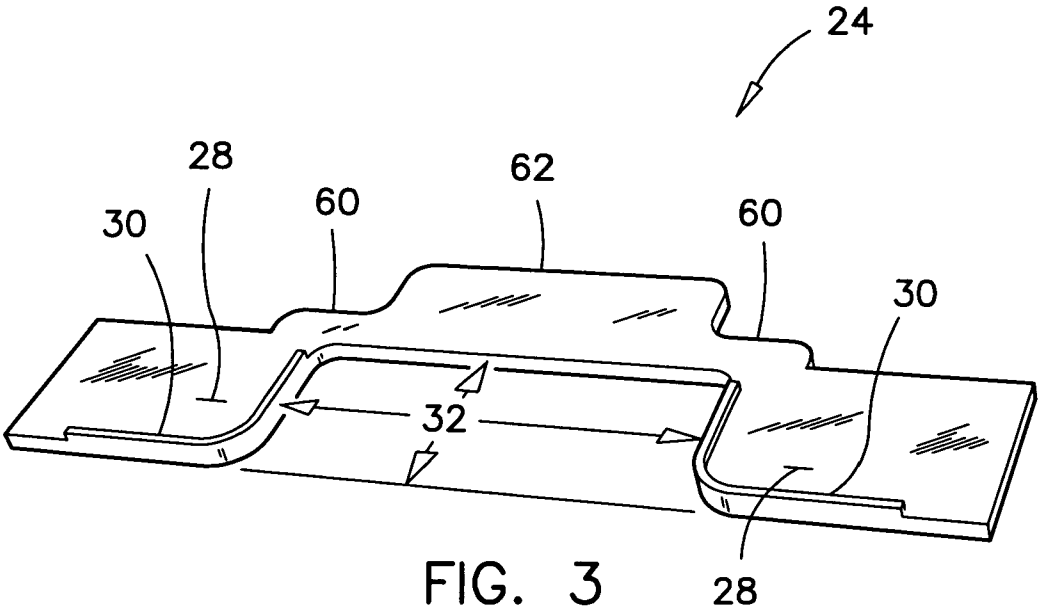


FIG. 3

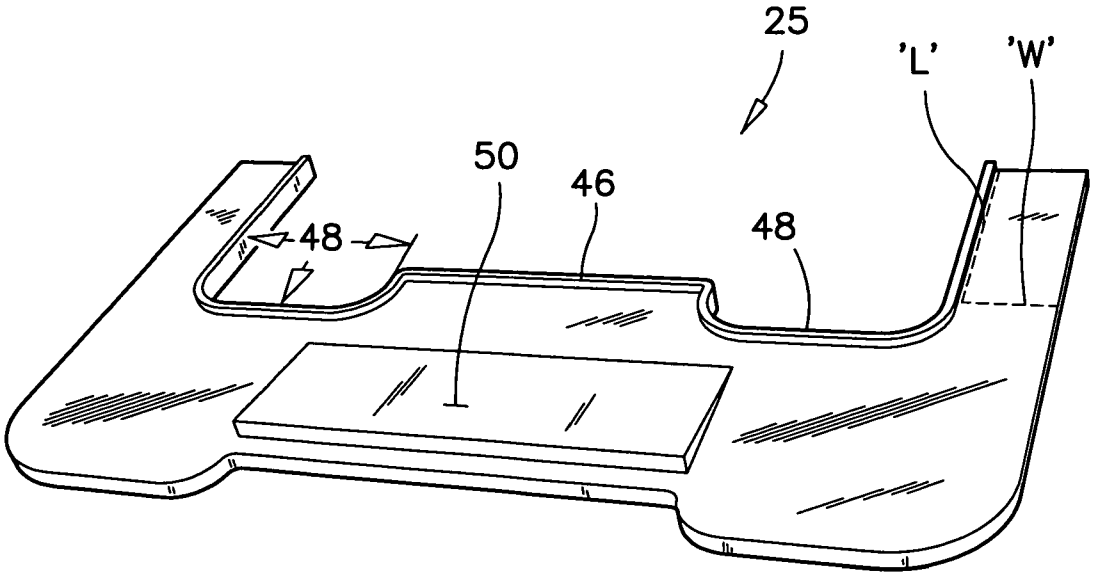


FIG. 4

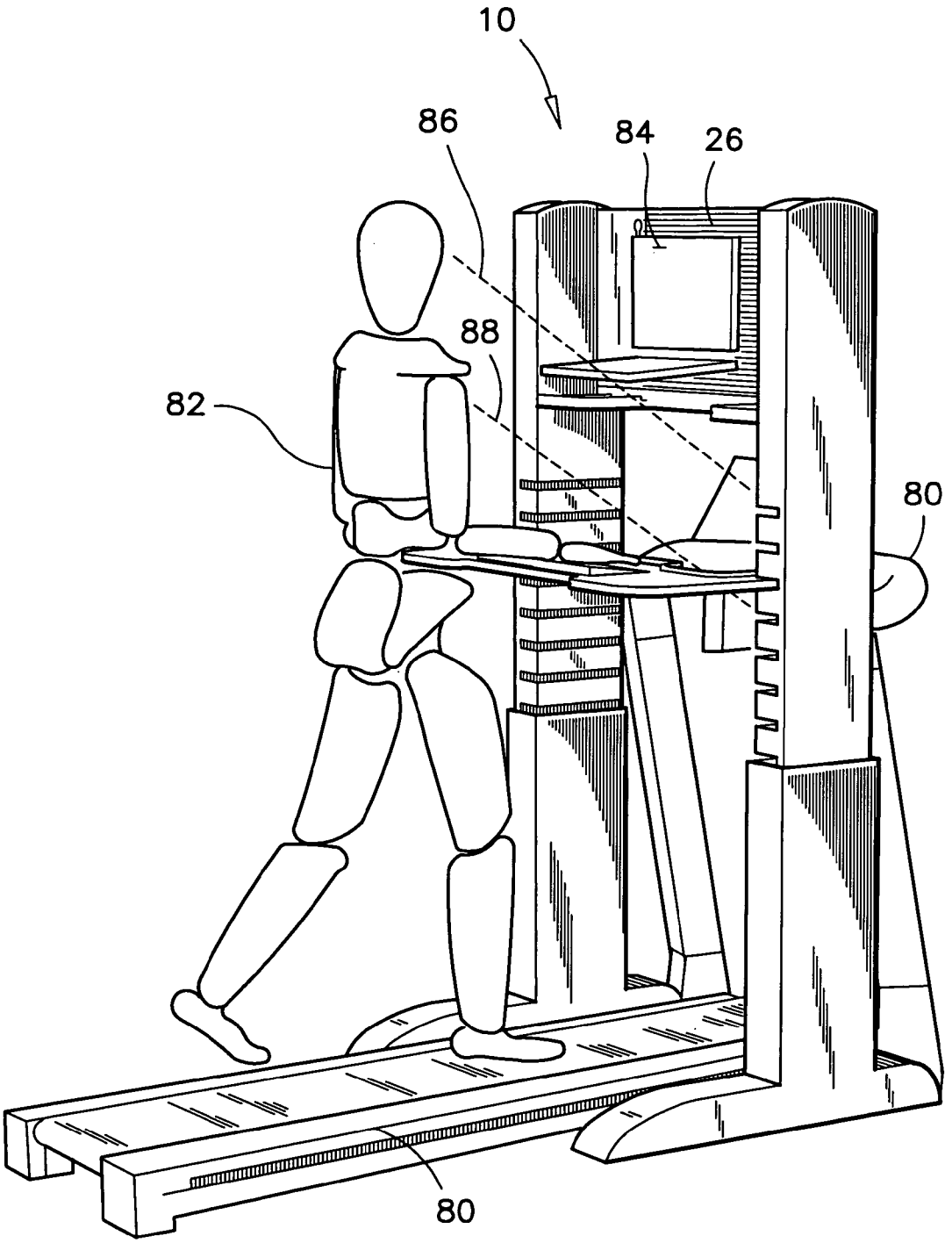


FIG. 5

ADJUSTABLE VERTICAL DESK

FIELD OF THE INVENTION

[0001] This invention pertains to office furniture, and more particularly, this invention pertains to a vertical desk that allows adult users the option of sitting, standing, or walking on a treadmill while at work on computer equipment.

BACKGROUND OF THE INVENTION

[0002] Cumulative trauma disorders also known as repetitive motion injuries, are a group of musculoskeletal disorders experienced most by computer users due to the misuse or over-use of muscles, tendons, and nerves. Most commonly affected body members are fingers, hands, wrists, elbows, arms, shoulders, backs, and necks.

[0003] Insurance company and government statistics show that repetitive motion injuries cost employers approximately $2 billion in lost revenue and medical costs annually. While industry suffers financial loss due to cumulative trauma disorders, affected workers suffer varying degrees of disability, pain and discomfort.

[0004] Factors that lead to injuries include repetitive tasks, such as typing, maintaining an awkward position or a fixed body position for extended periods of time, insufficient recovery time, and the pace of work performed. Workers may develop inflammation of joints and muscles and suffer symptoms such as numbness, redness, tingling, burning, decrease in joint motion, weakness, clumsiness, loss of strength, pain, aching, swelling, and cracking or popping of joints. Exacerbating the problem for desk-bound workers is anthropometric mismatch, the use of office furniture that does not properly fit the stature of the user, potentially promoting contorted posture and poor body alignment.

[0005] To mitigate these problems, desks should ideally be adjustable to better fit the stature of each user, should allow flexibility in the placement of computer equipment, should permit physical movement while the worker continues to perform computer tasks, and should promote mild cardiovascular exercise.

[0006] In regard to cardiovascular exercises, attempts have been made in the past to design computer desks that allow adjustment thereof for use in combination with exercise equipment such as a treadmill. The following publications disclose examples of computer workstations that are used in combination with a treadmill.

[0007] U.S. Pat. No. 6,808,475 issued to J. M. Kehrbaum on Oct. 26, 2004; discloses a computer workstation that is usable in combination with a treadmill. This concept includes a cubicle device enclosing a treadmill. The cubicle has shelves therein for supporting the computer equipment above the forward end of the treadmill.

[0008] U.S. Pat. No. 7,614,991 issued to S. Fox on Nov. 10, 2009; discloses another cubicle device enclosing a treadmill. A table is set over the forward end of the treadmill for supporting a computer and a keyboard.

[0009] U.S. Pat. No. 5,257,701 issued to N. Edelson on Nov. 2, 1993; discloses an adjustable rack having a table that can be adjusted to different heights. The rack can be set over a treadmill for supporting a computer over a treadmill while a user exercises on the treadmill.

[0010] While the prior art confirms the need for a desk and treadmill combination, the prior art designs have had limited success in providing adjustment options at hand and eye levels, versatility of use, and design compactness.

[0011] Thus despite efforts of others to provide an ergonomically correct computer desk, a significant need remains.

SUMMARY OF THE INVENTION

[0012] The adjustable vertical desk according to the present invention has two legs between which is located a vertical display surface with front-facing attachment slats. The attachment slats are used to support a computer screen or a computer at a desired height. A shelf may be attached between the two legs below the display surface. A desk surface is also attached to the legs below the shelf for supporting a keyboard, a computer mouse, and other hand-held items. The desk surface is mounted to the legs in a pair of channels formed in the legs. A plurality of spaced-apart channels are provided to selectively mount the desk surface at a proper height.

[0013] The adjustable vertical desk according to the present invention reflects the sciences of ergonomics and kinesiology. The desk permits physical activity and increased movement in the normal course of the work day. The desk is not fixed in position and may be moved as needed, facilitating alternate uses including as a desk only or as a desk with treadmill. The vertical desk also creates a work space in a smaller footprint than that of many conventional desks due to its utilisation of vertical space; a potential benefit in both home and corporate environments.

[0014] The desk permits the placement of office and electronic equipment in ergonomically advantageous positions to suit the stature of a range of adult users. The ability to locate equipment as per height and work habits encourages proper body alignment, comfort, and improved posture, minimizing the factors that contribute to musculoskeletal injury typically present when using a conventional, flat desk. Users of the adjustable vertical desk may stand, sit in a tall chair, or walk on a treadmill, allowing more freedom of movement and a more upright posture than is possible in a conventional, seated desk position.

[0015] In another aspect of the vertical desk according to the present invention, there is provided in combination, a treadmill and a vertical desk mounted astride the treadmill. The vertical desk has two spaced-apart legs; a display surface extending vertically across top portions of the legs; a shelf affixed to the legs below the display surface; and a desk surface affixed to the legs below the shelf. The shelf has an open central area along a forward edge thereof providing unobstructed view to control panel of the treadmill by a user of the vertical desk and treadmill. Also, the desk surface has recesses in a rear edge thereof providing unobstructed access to controls of the treadmill.

[0016] When the adjustable vertical desk is used with a standard treadmill, an adult user thereof is able to complete computer work normally while walking at a slow pace. Mild cardiovascular activity is possible while walking on the treadmill and medical studies have shown that computer activity can continue uninterrupted while walking at a slow pace. The gentle activity of walking promotes fitness and alertness as it increases blood flow through the body. Walking while using the desk aids in mitigating neck, shoulder, back, and joint strain normally associated with a static, seated desk position, and is particularly beneficial when the placement of computer equipment is tailored to the stature and work habits of each

worker. The curved, cut-out areas of the shelf and desk surface facilitate access to treadmill panel and controls.

[0017] In yet another aspect of the vertical desk according to the present invention, the display surface has slots therein for passing computer wiring there through, and the shelf has a shelf extension extending behind said display surface for supporting a power bar thereon behind the display surface. The shelf also has brackets extending upward therefrom for retaining computer wiring thereto behind the display surface. The slots in the display surface, the shelf extension and the brackets cooperate together to maintain all computer wiring in a neat and tidy arrangement.

[0018] When the adjustable vertical desk is used without a treadmill, the user has the option of sitting in a more upright posture on a tall, draughtsman chair with footrest, or standing for periods of time while working, allowing the body more freedom of movement and the opportunity to stretch as often as needed without interrupting productivity. Electronic office equipment to be viewed and the desk surface for keyboard and mouse can each be separately positioned to better accommodate a range of user heights.

[0019] This brief summary has been provided so that the nature of the invention may be understood quickly. A more complete understanding of the invention can be obtained by reference to the following detailed description of the preferred embodiment thereof in connection with the attached drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0020] A preferred embodiment of the adjustable vertical desk is illustrated in the attached drawings. In these drawings the same numeral labels are used to identify the same elements. In the drawings;

[0021] FIG. **1** is a perspective front, top and right side view of the adjustable vertical desk according to a preferred embodiment of the present invention;

[0022] FIG. **2** is a perspective rear, top and right side view of the adjustable vertical desk according to the preferred embodiment;

[0023] FIG. **3** is a perspective front and top view of the shelf that is mountable to the adjustable vertical desk;

[0024] FIG. **4** is a perspective front and top view of the desk surface that is mountable to the adjustable vertical desk;

[0025] FIG. **5** shows the adjustable vertical desk in use over a treadmill.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0026] While this invention is susceptible of embodiment in many different forms, there are shown in the drawings and will be described in details herein, one specific embodiment of an adjustable vertical desk. It should be understood that the present disclosure is to be considered as an example of the principles of the invention and is not intended to limit the invention to the embodiment illustrated and described.

[0027] Referring to FIGS. **1** and **2**, the preferred adjustable vertical desk **10** includes basically two leg footings **20** with inverted T-shapes, two leg extensions **22** extending from the leg footings **20**, a vertical display surface **23**, a horizontal shelf **24**, and a horizontal desk surface **25**. On the forward side of the display surface **23** there is mounted a slat wall **26** extending from the top to the bottom edges of the vertical display surface **23**. The slat wall **26** has grooves therein to which can be attached a flat computer screen for example, to different heights.

[0028] On either or both sides of the slat wall **26** there are provided vertical slots **27** for passing electrical cords and computer cables through the display surface **23**.

[0029] Referring now to FIG. **3** in combination with FIGS. **1** and **2**, the structure and function of the shelf **24** will be explained. The shelf **24** has side portions **28** extending forward the display surface **23**. These side portions **28** are convenient for supporting pens, a portable phone, eyeglasses or other personal articles. The shelf **24** has a U-like shape and raised lips **30** along its front edge to catch small objects such as pens. The shelf **24** has a U-like shape with an open front central area **32** to provide an unobstructed view of a computer screen mounted to the display surface **23** when viewed from below the shelf level by a person of a short stature, or to provide an unobstructed view of the treadmill control panel viewed from above the shelf level, by a person of a tall stature.

[0030] Referring back to FIG. **1**, the leg footings **20** have sockets **40** on their top ends as can be understood at label **40**. The leg extensions **22** are telescopically inserted in these sockets **40** and extend upward from the leg footings **20**. The leg extensions **22** are separable from the leg footings **20** so that the adjustable vertical desk **10** can be delivered to a buyer in a compact form.

[0031] The leg extensions **22** have horizontal transverse channels **44** therein at spaced intervals. The desk surface **25** is mountable in a pair of these transverse channels **44** as illustrated in FIGS. **1** and **2**. The plurality of transverse channels **44** allow the placement of the desk surface **25** at a plurality of heights to satisfy the stature or posture of a user of the adjustable vertical desk **10**. The transverse channels **44** preferably extend into the leg extensions **22** from the font side of the leg extensions **22**, but can also extend from the rear side, as those illustrated in FIG. **2** for supporting the shelf **24**.

[0032] The desk surface **25** has a raised lip **46** which runs along the rear edge thereof to catch small objects such as pens. The desk surface **25** is better illustrated in FIG. **4**. The rear edge of the horizontal desk surface **25** has two identical recesses **48** to provide easy access to treadmill controls when the adjustable vertical desk **10** is used in combination with a treadmill.

[0033] The desk surface **25** also has a keyboard wedge **50** mounted on its central forward area. The keyboard wedge **50** has a triangular shape with a backward inclination for negatively tilting the keyboard relative to the user of the keyboard to encourage a more relaxed and natural curvature of the wrist while typing, to promote wrist comfort. The keyboard wedge **50** is removable from the desk surface **25** if a flat keyboard surface is preferred.

[0034] Referring now to FIGS. **2** and **3**, the shelf **24** has a rear portion **60** extending behind the display surface **23**. The rear portion **60** includes central extension **62**. The purpose of this central extension **62** is to support an electrical power bar (not shown) for supplying electrical power to a computer or a computer screen mounted to the display surface **23**.

[0035] Referring again to FIG. **2**, a pair of angle brackets **64** are preferably mounted to the rear portion **60** at each sides of the central portion **62**. These brackets **64** are convenient for neatly retaining unsightly electrical cords that are needed with computer equipment. The provision of the slots **27** in the display surface **23**, the central extension **62** and the brackets **64** provide means for neatly arranging all power cables and

other computer wiring so that no wire hangs down over the control panel of the treadmill when the adjustable portable desk is used with a treadmill.

[0036] Referring again to FIGS. **1** and **2**, the vertical display surface **23** mounts into vertical grooves **70** formed in the leg extensions **22**. The vertical grooves **70** have a T-like cross-section, a dovetail-like cross-section or a square cross-section as those illustrated.

[0037] Similarly, the transverse channels **44** can have different cross-sections. When a square or rectangular cross-section is used, the preferred thickness 'T' of each channel **44** as seen in FIG. **1** is a free sliding fit of the desk surface **25** or the shelf **24** therein. The preferred engagement dimensions of the shelf **24** and of the desk surface **25** into each channel **44**, as illustrated by dash lines 'L' and 'W' in FIG. **4**, in relation with the thickness 'T' of each channel **44** is about 12:1 and 4:1 respectively. Such dimensions provides an easy assembly of the shelf **23** and desk surface **24** to the leg extensions **22** and provide stability and sturdiness of the adjustable vertical desk **10** in use.

[0038] Referring now to FIG. **5** while referring to FIGS. **3** and **4**, there is illustrated therein a preferred use of the adjustable vertical desk **10**, in combination with a treadmill **80**. The user of the preferred desk **10** is represented by the android **82**. The preferred adjustable vertical desk **10** is preferably mounted astride the treadmill **80** as illustrated. As can be seen, a laptop computer **84** is mountable to the slat wall **26**. As may also be understood, the open central area **32** of the shelf **24** allows unobstructed line of sight **86** to the control panel of the treadmill **80**, and the recesses **48** in the desk surface **25** allow unobstructed access **88** to the treadmill controls.

[0039] Although the preferred adjustable vertical desk **10** has been illustrated in use with a treadmill **80**, it will be understood that it can also be used as a stand alone desk by a person standing or it can be used by a person sitting on a draughtsman chair for example. Drawings of the preferred adjustable vertical desk **10** in use by a person standing or sitting have not been provided as these drawings are considered repetitive and unnecessary.

[0040] The above description, illustrations and examples provided should not be construed as limiting the scope of the invention, which is defined by the appended claims.

What is claimed is:

1. A vertical desk comprising;

two spaced-apart legs;

a display surface extending vertically across top portions of said legs;

a shelf affixed to said legs at an intermediate height along said legs below said display surface; and

a desk surface affixed to said legs below said shelf;

said legs having a plurality of spaced-apart channels formed therein and said desk surface being selectively affixed to a pair of said channels.

2. The vertical desk as claimed in claim **1**, further comprising a keyboard wedge mounted over said desk surface for supporting a keyboard in a negatively tilting orientation over said desk surface.

3. The vertical desk as claimed in claim **1**, wherein said shelf has a raised lip along a front edge thereof and said desk surface has a raised lip along a rear edge thereof.

4. The vertical desk as claimed in claim **1**, wherein each of said legs comprise a leg footing and a leg extension telescopically and removably mounted to said leg footing.

5. The vertical desk as claimed in claim **4**, wherein each of leg extension has a vertical groove therein and said display surface is mounted in said grooves.

6. The vertical desk as claimed in claim **1** wherein said desk surface is affixed to said pair of channels in a free sliding fit in said channels.

7. The vertical desk as claimed in claim **6**, wherein each of said channels has a thickness, and an engagement of said desk surface in one of said channels has a length over said thickness ratio of 12:1 and a width over said thickness ratio of 4:1.

8. The vertical desk as claimed in claim **1**, wherein said display surface has slots therein for passing computer wiring there through.

9. The vertical desk as claimed in claim **8**, wherein said shelf has a shelf extension extending behind said display surface for supporting a power bar thereon; and brackets extending upward therefrom for retaining computer wiring behind said display surface.

10. A vertical desk comprising;

two spaced-apart legs;

a display surface extending vertically across top portions of said legs;

a shelf affixed to said legs at an intermediate height along said legs below said display surface; and

a desk surface affixed to said legs below said shelf;

said display surface having grooves therein for retaining computer equipment thereto at different heights.

11. The vertical desk as claimed in claim **10**, wherein said shelf has side portions extending forward said display surface and a central portion extending behind said display surface.

12. The vertical desk as claimed in claim **10**, wherein said display surface has slots therein for passing computer wiring there through.

13. The vertical desk as claimed in claim **11**, wherein said central portion has a shelf extension for supporting a power bar thereon behind said display surface.

14. The vertical desk as claimed in claim **13**, wherein said shelf has brackets mounted to said central portion for retaining computer wiring behind said display surface near said power bar.

15. In combination a treadmill and a vertical desk, said vertical desk comprising;

two spaced-apart legs mounted astride said treadmill;

a display surface extending vertically across top portions of said legs;

a shelf affixed to said legs at an intermediate height along said legs below said display surface; and

a desk surface affixed to said legs below said shelf;

said legs having a plurality of vertically spaced-apart channels formed therein;

said desk surface being selectively affixed to a pair of said channels.

16. The combination as claimed in claim **15**, wherein said shelf has an open central area along a forward edge thereof providing unobstructed view of a control panel of said treadmill by a user of said vertical desk.

17. The combination as claimed in claim **15**, wherein said desk surface has recesses in a rear edge thereof providing unobstructed access to controls of said treadmill by a user of said vertical desk.

18. The combination as claimed in claim **15**, further comprising a keyboard wedge mounted over said desk surface for supporting a keyboard in a negatively tilting orientation over said desk surface.

19. The combination as claimed in claim **15**, wherein said display surface has slots therein for passing computer wiring there through, and wherein said shelf has brackets mounted thereto behind said display surface for retaining computer wiring behind said display surface.

20. The combination as claimed in claim **19**, wherein said shelf has a shelf extension extending behind said display surface for supporting a power bar thereon behind said display surface.

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