

HEIGHT-ADJUSTABLE TABLE

TECHNICAL FIELD

[0001] This invention relates to a height-adjustable table.

BACKGROUND

[0002] The following discussion of the background to the invention is intended to facilitate an understanding of the present invention only. It should be appreciated that the discussion is not an acknowledgement or admission that any of the material referred to was published, known or part of the common general knowledge of the person skilled in the art in any jurisdiction as at the priority date of the invention.

[0003] A height-adjustable table allow a user to select a table-top height according to his preference, ranging from a lowest sitting position to a highest standing position, for example. In many cases, the height-adjustable table supports multiple electronic devices and computer peripherals that each require connection to a power source in order to operate and/or charge these devices and peripherals. The table itself also requires connection to a power source in order to operate the motor for moving the table-top to the desired height. This results in a profusion of cables trailing about the table that is unsightly as well as laborious to keep clean.

SUMMARY

[0004] According to a first aspect, there is provided a height-adjustable table comprising: a tabletop; at least one extendable and retractable table leg provided to support the tabletop, the table leg defining a hollow channel therein, wherein the table leg comprises: a height-adjustment mechanism provided within the hollow channel to actuate extension and retraction of the table leg; an electric motor provided to drive the height-adjustment mechanism; a top electrical socket provided at a top end of the table leg; an extendable and retractable coil of electrical cable provided within the hollow channel, wherein a top end of the coil of electrical cable is in electrical communication with the top electrical socket and also in electrical communication with the electric motor, and wherein a bottom end of the coil of electrical cable is

electrically connectable to a power supply, wherein the top electrical socket is configured to receive therein a plug of a further electrical cable to supply power from the power supply to anything on the tabletop that requires electrical power.

[0005] The height-adjustable table may further comprise a controller in electrical communication with the electric motor to control the electric motor for extending and retracting the table leg.

[0006] According to a second aspect, there is provided a table leg for supporting a tabletop of a height-adjustable table, the table leg comprising: a hollow channel defined by the table leg, a height-adjustment mechanism provided within the hollow channel to actuate extension and retraction of the table leg; an electric motor provided to drive the height-adjustment mechanism; a top electrical socket provided at a top end of the table leg; an extendable and retractable coil of electrical cable provided within the hollow channel, wherein a top end of the coil of electrical cable is in electrical communication with the top electrical socket and also in electrical communication with the electric motor, and wherein a bottom end of the coil of electrical cable is electrically connectable to a power supply, wherein the top electrical socket is configured to receive therein a plug of a further electrical cable to supply power from the power supply to anything on the tabletop that requires electrical power.

[0007] The electric motor may be in electrical communication with a controller of the height-adjustable table to control the electric motor for extending and retracting the table leg.

[0008] For both aspects, a bottom electrical socket may be provided at a bottom end of the table leg and configured to receive a plug of a power cable therein to electrically connect the bottom electrical socket to a power supply, wherein the bottom end of the coil of electrical cable is in electrical communication with the bottom electrical socket.

[0009] The bottom electrical socket may comprise one of: a C14 International Electrical Commission (IEC) electrical inlet and a C20 International Electrical Commission (IEC) electrical inlet. Alternatively, the bottom end of the coil of electrical

cable may be in electrical communication with a power cable provided at a bottom end of the table leg, wherein the power cable is configured to be connectable to the power supply.

[0010] The top electrical socket may have a configuration of a wall socket.

[0011] The height-adjustment mechanism may be housed within a protective casing provided in the hollow channel.

[0012] The coil of electrical cable may be at least partially housed within a protective tube provided in the hollow channel.

[0013] A bottom end of the protective tube may be bevelled to provide an elliptical opening for smooth relative movement of the coil of electrical cable into the bottom end of the protective tube.

[0014] A cable stabiliser may be provided in a bottom end of the table leg, the cable stabiliser comprising a helical guide portion attached to a non-moving part of the table leg and configured to immovably accommodate a few coils of a bottom end of the coil of electrical cable thereon.

[0015] A circuit breaker may be provided in the table leg and in electrical communication with the bottom end of the coil of electrical cable to interrupt current flow from the power supply to the coil of electrical cable in case of a short circuit or overcurrent from the power supply.

BRIEF DESCRIPTION OF DRAWINGS

[0016] In order that the invention may be fully understood and readily put into practical effect there shall now be described by way of non-limitative example only exemplary embodiments of the present invention, the description being with reference to the accompanying illustrative drawings, in which:

Fig. 1 is a schematic illustration of a height-adjustable table.

Fig. 2 is a schematic longitudinal cross-sectional view of a first exemplary

embodiment of a table leg of the height-adjustable table.

Fig. 3 is a schematic illustration of electrical connections provided in a first exemplary embodiment of the height-adjustable table.

Fig. 4 is a schematic longitudinal cross-sectional view of a second exemplary embodiment of a table leg of the height-adjustable table.

Fig. 5 is a schematic longitudinal internal view of a third exemplary embodiment of a table leg of the height-adjustable table.

Fig. 6 is a close-up perspective internal view of the bottom end of the table leg of Fig. 5 without a coil of electrical cable.

Fig. 7 is a close-up perspective internal view of the bottom end of the table leg of Fig. 5 including the coil of electrical cable.

DETAILED DESCRIPTION OF THE EMBODIMENTS

[0017] Throughout this document, unless otherwise indicated to the contrary, the terms “comprising”, “consisting of”, “having” and the like, are to be construed as non-exhaustive, or in other words, as meaning “including, but not limited to.”

[0018] Furthermore, throughout the specification, unless the context requires otherwise, the word “include” or variations such as “includes” or “including” will be understood to imply the inclusion of a stated integer or group of integers but not the exclusion of any other integer or group of integers.

[0019] Unless defined otherwise, all technical and scientific terms used herein have the same meaning as is commonly understood by a skilled person to which the subject matter herein belongs.

[0020] Exemplary embodiments of a height-adjustable table 100 will be described below with reference to Figs. 1 to 7, wherein the same or similar parts have the same reference numerals.

[0021] For all embodiments, the height-adjustable table 100 comprises a tabletop

10 supported by at least one table leg 80. In an exemplary embodiment as shown in Fig. 1, the table 100 may comprise two table legs 80. Each table leg 80 is extendable and retractable between a first position (e.g. a lowest sitting position, shown in solid lines) and a second position (e.g. highest standing position, shown in dotted lines).

[0022] Each table leg 80 may comprise a plurality of nested, telescoping tubes 89 defining a hollow channel 83 within the table leg 80, as shown in Fig. 2. Extension and retraction of the table leg 80 is actuated by a known height-adjustment mechanism 70 that is housed in the hollow channel 83 of the table leg 80 and driven by an electric motor 71. For example, the height-adjustment mechanism 70 may comprise a motor-driven threaded rod 78 screwed into one end of a receiving tube 79 such that screwing the threaded rod 78 into and out of the receiving tube 79 respectively retracts and extends the table leg 80. In an exemplary embodiment, the electric motor 71 is housed in a casing 87 provided at a top end 81 of the table leg 80, and may comprise a direct current (DC) motor. The height-adjustment mechanism 70 may optionally be at least partially housed within a protective casing 73 provided in the hollow channel 83.

[0023] Fig. 3 is a schematic architectural diagram of electrical connections provided in a first exemplary embodiment of the height-adjustable table 100. In at least one of the legs 80 of the table 100, there is provided an extendable and retractable coil of electrical cable 60 within the hollow channel 83, alongside the height-adjustment mechanism 70, as can be seen in Fig. 2. The coil of electrical cable 60 has a configuration of a helical coil, like a spring coil, and may comprise a live wire and a neutral wire, and preferably also an earth wire.

[0024] In the first exemplary embodiment, a bottom end of the coil of electrical cable 60 is in electrical communication with a bottom electrical socket 52 provided at a bottom end 82 of the table leg 80. The bottom electrical socket 52 is configured to be electrically connectable to a power supply 90 by plugging a plug at a first end of a power cable 92 into the bottom electrical socket 52 and connecting a second end of the power cable to the power supply 90. For all embodiments, the power supply 90 may comprise mains electricity that is available via a wall socket.

[0025] As shown in Fig. 3, a top end of the coil of electrical cable 60 is in electrical

communication with a controller 74 that is activated by a control panel 75 and in electrical communication with the electric motor 71 for controlling the electric motor 71 to extend or retract the table leg 80. In this way, electrical power is delivered from the power supply 90 to the electric motor 71 via the power cable 92, the bottom electrical socket 52, the coil of electrical cable 60 and the controller 74. Where the table 100 comprises more than one table leg 80, the controller 74 is in electrical communication with the electric motors 71 of each of the table legs 80 in order to control extension and retraction of each table leg 80. The controller 74 may be provided at the top end of the table leg 81 or anywhere appropriate under the tabletop 10. The control panel 75 is preferably provided adjacent or at the tabletop 10 for easy access by the user.

[0026] Notably, the top end of the coil of electrical cable 60 is also in electrical connection with a top electrical socket 51 provided at the top end 81 of the table leg 80. The top electrical socket 51 allows a further electrical cable 41 that is not part of the height-adjustable table 100 to be in electrical communication with the coil of electrical cable 60 by plugging a plug of the further electrical cable 41 into the top electrical socket 51. In this way, anything on the tabletop 10 that requires electrical power (hereinafter collectively referred to as “devices”) and is in electrical communication with the further electrical cable 41 is also able to draw on the power supply 90 via the power cable 92, the bottom electrical socket 52, the coil of electrical cable 60 and the top electrical socket 51. For example, the further electrical cable 41 may be part of a power strip 40 into which devices (not shown) such as electronic devices and computer peripherals may be plugged.

[0027] In the first exemplary embodiment, a terminal block 53 may be provided in the table leg 80 and used to electrically connect the top end of the coil of electrical cable 60 to both the controller 74 and the top electrical socket 51, as can be seen in Fig. 3.

[0028] In some embodiments, the top electrical socket 51 may have a similar or identical configuration as a wall socket for convenient plugging in of a power strip 40 or devices on the tabletop 10 that require electrical power. For example, the top electrical socket 51 may have the configuration of a regional or universal wall socket

that is able to receive plugs of different configurations that are used in different parts of the world. In alternative embodiments, the top electrical socket 51 may comprise a C13 International Electrical Commission (IEC) connector. The bottom electrical socket 52 may comprise a C14 IEC electrical inlet, and in this case the power cable 92 accordingly comprises an IEC cord. In other embodiments, the bottom electrical socket 52 may alternatively comprise a C20 IEC electrical inlet, or any other appropriate desired form for establishing an electrical connection with the power supply 90 via the power cable 92.

[0029] In an alternative embodiment of the height-adjustable table 100 as shown in Fig. 4, a difference from the first embodiment described above is that no bottom electrical socket is provided at a bottom end 82 of the table leg 80. Instead, the bottom end of the coil of electrical cable 60 is in electrical communication with a power cable 92 that is provided at the bottom end 82 of the table leg 80. The power cable 92 is configured to be connected to the power supply 90 in order to supply power to the top electrical socket 51 and the electric motor 71 via the coil of electrical cable 60.

[0030] For all embodiments, in its coil form, the coil of electrical cable 60 is readily extendable and retractable like a coil spring within the table leg 80 so that extension and retraction of the table leg 80 does not affect electrical connectivity provided by the coil of electrical cable 60 between the power supply 90 and the top electrical socket 51 and also the electric motor 71.

[0031] In some embodiments, a protective tube 62 may optionally be provided in the hollow channel 83, as shown in Figs. 2 and 4-7, to house the coil of electrical cable 60 therein. The protective tube 62 may comprise a cylindrical tube, and may be made of a plastic material, and optionally internally lined with felt or another noise absorbing material so as to reduce noise during retraction and extension of the table leg 80 for height adjustment of the table 100.

[0032] To further improve noise reduction, a bottom end 63 of the protective tube 62 may be bevelled such that the bottom end 63 of the protective tube 62 has an elliptical opening, as can be seen in Figs. 5-7. The elliptical opening allows the coils of the coil of electrical cable 60 to relatively move smoothly into the bottom end 63 of

the protective tube 62 when the table leg 80 is retracted. This avoids a situation of the coils of the coil of electrical cable 60 catching against the bottom end 63 of the protective tube 62 during retraction of the table leg 80 and giving rise to undesirable noise, which could occur if the bottom end 63 had a regular circular opening.

[0033] To keep the coil of electrical cable 60 in alignment within the table leg 80 and prevent the bottom end of the coil of electrical cable 60 from accidentally pulling away from the bottom electrical socket 52 or power cable 92, a cable stabiliser 64 may optionally be provided in the bottom end of the table leg 82, as shown in Figs. 5-7. In an exemplary embodiment, the cable stabiliser 64 comprises a helical guide portion 65 that is secured to a non-moving part of the table leg 82. The helical guide portion 65 may be provided on a bracket 66 that is immovably attached to the non-moving part of the table leg 82. The helical guide portion 65 is provided and shaped to immovably accommodate a few coils of a bottom end of the coil of electrical cable 60 thereon. For example, the helical guide portion 65 may comprise a broad helical blade that makes two turns about a central shaft, wherein in use, the last two or three coils of the coil of electrical cable 60 are coiled about the central shaft and held in place by the broad helical blade. The coils of the coil of electrical cable 60 that are accommodated by the helical guide 65 remain stationary during extension and retraction of the coil of electrical cable 60 when the tabletop 10 is raised or lowered. This stabilises the bottom end of the coil of electrical cable 60 within the table leg 80 such that the coil of electrical cable 60 cannot be pulled away from the bottom electrical socket 52 or power cable 92 when the coil of electrical cable 60 is extended. The cable stabiliser 64 also helps to keep the coil of electrical cable 60 aligned or centred within the table leg 80 in order to prevent the coil of electrical cable 60 from catching against the bottom end 63 of the protective tube 62 and causing noise during retraction of the table leg 80.

[0034] To enhance safety of the height-adjustable table 100, for all embodiments, a circuit breaker 54 may optionally be provided in the table leg 80 in electrical communication with the bottom end of the coil of electrical cable 60 to interrupt current flow from the power supply 90 to the coil of electrical cable 60 in case of a short circuit or overcurrent from the power supply 90. In some embodiments where a bottom electrical socket 52 is provided, the bottom electrical socket 52 may be

housed together with a circuit breaker 54 as shown in Figs. 5-7, or alternatively the circuit breaker 54 may be provided separately from the bottom electrical socket 52 as shown in Figs. 3.

[0035] In the presently disclosed height-adjustable table 100, the electrical cable 60 advantageously serves a dual function of powering the height-adjustment mechanism 70 of the table 100 and also providing easily accessible power to anything on the tabletop 10 that requires electrical power. Any device(s) on the tabletop 10 may be conveniently connected to the power supply 90 either directly to the accessible top electrical socket 51 or via a power strip 40 that is in electrical connection with the top electrical socket 51. The presently disclosed height-adjustable table 100 thus removes the need to trail unsightly and messy cables from devices on the tabletop 10 to a wall socket or to a power strip on the floor. Using the present height-adjustable table 100, only a single power cable 92 needs to be connected from the wall socket 90 to the table 100 in order to power both the height-adjustment mechanism 70 of the table 100 as well as devices on the tabletop 10. The present height-adjustable table 100 thus presents a neat and tidy appearance while improving ease of use for the user to power devices on the tabletop 10.

[0036] While there has been described in the foregoing description exemplary embodiments of the present invention, it will be understood by those skilled in the technology concerned that many variations in details of design, construction and/or operation may be made without departing from the present invention.

CLAIMS

1. A height-adjustable table comprising:
 - a tabletop;
 - at least one extendable and retractable table leg provided to support the tabletop, the table leg defining a hollow channel therein, wherein the table leg comprises:
 - a height-adjustment mechanism provided within the hollow channel to actuate extension and retraction of the table leg;
 - an electric motor provided to drive the height-adjustment mechanism;
 - a top electrical socket provided at a top end of the table leg;
 - an extendable and retractable coil of electrical cable provided within the hollow channel, wherein a top end of the coil of electrical cable is in electrical communication with the top electrical socket and also in electrical communication with the electric motor, and wherein a bottom end of the coil of electrical cable is electrically connectable to a power supply,
 - wherein the top electrical socket is configured to receive therein a plug of a further electrical cable to supply power from the power supply to anything on the tabletop that requires electrical power.
2. The height-adjustable table of claim 1, further comprising a bottom electrical socket provided at a bottom end of the table leg and configured to receive a plug of a power cable therein to electrically connect the bottom electrical socket to a power supply, wherein the bottom end of the coil of electrical cable is in electrical communication with the bottom electrical socket.
3. The height-adjustable table of claim 2, wherein the bottom electrical socket comprises one of: a C14 International Electrical Commission (IEC) electrical inlet and a C20 International Electrical Commission (IEC) electrical inlet.

4. The height-adjustable table of claim 1, wherein the bottom end of the coil of electrical cable is in electrical communication with a power cable provided at a bottom end of the table leg, wherein the power cable is configured to be connectable to the power supply.
5. The height-adjustable table of any one of the preceding claims, wherein the top electrical socket has a configuration of a wall socket.
6. The height-adjustable table of any one of the preceding claims, further comprising a controller in electrical communication with the electric motor to control the electric motor for extending and retracting the table leg.
7. The height-adjustable table of any one of the preceding claims, wherein the height-adjustment mechanism is housed within a protective casing provided in the hollow channel.
8. The height-adjustable table of any one of the preceding claims, wherein the coil of electrical cable is at least partially housed within a protective tube provided in the hollow channel.
9. The height-adjustable table of claim 8, wherein a bottom end of the protective tube is bevelled to provide an elliptical opening for smooth relative movement of the coil of electrical cable into the bottom end of the protective tube.
10. The height-adjustable table of any one of the preceding claims, further comprising a cable stabiliser provided in a bottom end of the table leg, the cable stabiliser comprising a helical guide portion attached to a non-moving part of the table leg and configured to immovably accommodate a few coils of a bottom end of the coil of electrical cable thereon.
11. The height-adjustable table of any one of the preceding claims, further comprising a circuit breaker provided in the table leg and in electrical communication with the bottom end of the coil of electrical cable to interrupt current flow from the power supply to the coil of electrical cable in case of a short circuit or overcurrent from the power supply.

12. A table leg for supporting a tabletop of a height-adjustable table, the table leg comprising:

- a hollow channel defined by the table leg;
- a height-adjustment mechanism provided within the hollow channel to actuate extension and retraction of the table leg;
- an electric motor provided to drive the height-adjustment mechanism;
- a top electrical socket provided at a top end of the table leg;
- an extendable and retractable coil of electrical cable provided within the hollow channel, wherein a top end of the coil of electrical cable is in electrical communication with the top electrical socket and also in electrical communication with the electric motor, and wherein a bottom end of the coil of electrical cable is electrically connectable to a power supply, wherein the top electrical socket is configured to receive therein a plug of a further electrical cable to supply power from the power supply to anything on the tabletop that requires electrical power.

13. The table leg of claim 12, further comprising a bottom electrical socket provided at a bottom end of the table leg and configured to receive a plug of a power cable therein to electrically connect the bottom electrical socket to a power supply, wherein the bottom end of the coil of electrical cable is in electrical communication with the bottom electrical socket.

14. The table leg of claim 13, wherein the bottom electrical socket comprises one of: a C14 International Electrical Commission (IEC) electrical inlet and a C20 International Electrical Commission (IEC) electrical inlet.

15. The table leg of claim 12, wherein the bottom end of the coil of electrical cable is in electrical communication with a power cable provided at a bottom end of the table leg, wherein the power cable is configured to be connectable to the power supply.

16. The table leg of any one of claims 12 to 15, wherein the top electrical socket has a configuration of a wall socket.

17. The table leg of any one of claims 12 to 16, wherein the electric motor is in electrical communication with a controller of the height-adjustable table to control the electric motor for extending and retracting the table leg.
18. The table leg of any one of claims 12 to 17, wherein the height-adjustment mechanism is housed within a protective casing provided in the hollow channel.
19. The table leg of any one of claims 12 to 18, wherein the coil of electrical cable is at least partially housed within a protective tube provided in the hollow channel.
20. The table leg of claim 19, wherein a bottom end of the protective tube is bevelled to provide an elliptical opening for smooth relative movement of the coil of electrical cable into the bottom end of the protective tube.
21. The table leg of any one of claims 12 to 20, further comprising a cable stabiliser provided in a bottom end of the table leg, the cable stabiliser comprising a helical guide portion attached to a non-moving part of the table leg and configured to immovably accommodate a few coils of a bottom end of the coil of electrical cable thereon.
22. The table leg of any one of claims 12 to 21, further comprising a circuit breaker provided in the table leg and in electrical communication with the bottom end of the coil of electrical cable to interrupt current flow from the power supply to the coil of electrical cable in case of a short circuit or overcurrent from the power supply.