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Inventor(s)	Douglas; Jakob et al.

ADJUSTABLE FRAME TO SUPPORT A WORKING SURFACE

Abstract

Adjustable frames to support working surfaces are disclosed herein. An example adjustable frame includes a first frame, a second frame, and a sliding mechanism connected to the first frame and the second frame, the sliding mechanism including a channel bracket having a slot and a slider configured to move within the slot.

Inventors: **Douglas; Jakob (Washington, IL), Fehr; Micah (Danvers, IL)**

Applicant: **CKnapp Sales, Inc.** (Goodfield, IL)

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Background/Summary

FIELD OF THE DISCLOSURE

[0001] This disclosure relates generally to working surfaces and, more particularly, to an adjustable frame to support a working surface.

BACKGROUND

[0002] In recent years, an increasing number of people have begun working from home which has led to an increase in the need for working surfaces. Standalone working surface frames have become popular alternatives to traditional tables and desks sold with both the frame and the working surface because they allow the user to customize their working experience by choosing frames and working surfaces that match their functional and aesthetic needs and desires. The user can utilize standalone working surface frames with a variety of custom-made or manufactured working surfaces.

Description

BRIEF DESCRIPTION OF THE DRAWINGS

[0003] FIG. **1**A illustrates an example adjustable frame constructed in accordance with teachings of this disclosure.

[0004] FIG. **1**B is an exploded view of the example adjustable frame of in accordance with teachings of this disclosure.

[0005] FIG. **2** is an exploded part perspective view of an example sliding mechanism in accordance with teachings of this disclosure.

[0006] FIG. **3**A is an isometric view illustrating the connection of the example channel bracket to the example leg of the adjustable frame in accordance with teachings of this disclosure.

[0007] FIG. **3**B is an isometric view illustrating the connection of the example crossbar to the example slider of the adjustable frame in accordance with teachings of this disclosure.

[0008] FIG. **4**A is an isometric view illustrating the example adjustable frame of FIGS. **1**A-B connected to example working surfaces in accordance with teachings of this disclosure.

[0009] FIG. **4**B illustrates another example configuration of the example adjustable frame of FIGS. **1**A-B connected to example working surfaces in accordance with teachings of this disclosure.

[0010] FIG. **5** is a down-up view of the example adjustable frame of FIGS. **1**A-**1**B in accordance with teachings of this disclosure.

[0011] FIG. **6** is a part view of an example control panel in accordance with the teachings of this disclosure.

[0012] FIG. **7** is a flowchart representative of an example method of constructing the adjustable frame of FIGS. **1**A-**1**B in accordance with teachings of this disclosure.

[0013] In general, the same reference numbers will be used throughout the drawing(s) and accompanying written description to refer to the same or like parts. The figures are not to scale. Instead, the thickness of the layers or regions may be enlarged in the drawings. Although the figures show layers and regions with clean lines and boundaries, some or all of these lines and/or boundaries may be idealized. In reality, the boundaries and/or lines may be unobservable, blended, and/or irregular.

[0014] As used herein, unless otherwise stated, the term “above” describes the relationship of two parts relative to Earth. A first part is above a second part, if the second part has at least one part between Earth and the first part. Likewise, as used herein, a first part is “below” a second part when the first part is closer to the Earth than the second part. As noted above, a first part can be above or below a second part with one or more of: other parts therebetween, without other parts therebetween, with the first and second parts touching, or without the first and second parts being in direct contact with one another.

[0015] As used in this patent, stating that any part (e.g., a layer, film, area, region, or plate) is in any way on (e.g., positioned on, located on, disposed on, or formed on, etc.) another part, indicates that the referenced part is either in contact with the other part, or that the referenced part is above the other part with one or more intermediate part(s) located therebetween.

[0016] As used herein, connection references (e.g., attached, coupled, connected, and joined) may include intermediate members between the elements referenced by the connection reference and/or relative movement between those elements unless otherwise indicated. As such, connection references do not necessarily infer that two elements are directly connected and/or in fixed relation to each other. As used herein, stating that any part is in "contact" with another part is defined to mean that there is no intermediate part between the two parts.

[0017] Unless specifically stated otherwise, descriptors such as "first," "second," "third," etc., are used herein without imputing or otherwise indicating any meaning of priority, physical order, arrangement in a list, and/or ordering in any way, but are merely used as labels and/or arbitrary names to distinguish elements for ease of understanding the disclosed examples. In some examples, the descriptor "first" may be used to refer to an element in the detailed description, while the same element may be referred to in a claim with a different descriptor such as "second" or "third." In such instances, it should be understood that such descriptors are used merely for identifying those elements distinctly that might, for example, otherwise share a same name.

[0018] As used herein, "approximately" and "about" modify their subjects/values to recognize the potential presence of variations that occur in real world applications. For example, "approximately" and "about" may modify dimensions that may not be exact due to manufacturing tolerances and/or other real world imperfections as will be understood by persons of ordinary skill in the art. For example, "approximately" and "about" may indicate such dimensions may be within a tolerance range of +/−5% unless otherwise specified in the below description.

[0019] Various terms are used herein to describe the orientation of features. In general, the attached figures are annotated with a set of axes including the x-axis X, the y-axis Y, and the z-axis Z. As disclosed herein, the z-axis runs orthogonal relative to a surface on which the adjustable frame resides.

[0020] As used herein, the phrase "in communication," including variations thereof, encompasses direct communication and/or indirect communication through one or more intermediary components, and does not require direct physical (e.g., wired) communication and/or constant communication, but rather additionally includes selective communication at periodic intervals, scheduled intervals, aperiodic intervals, and/or one-time events.

[0021] "Including" and "comprising" (and all forms and tenses thereof) are used herein to be open ended terms. Thus, whenever a claim employs any form of "include" or "comprise" (e.g., comprises, includes, comprising, including, having, etc.) as a preamble or within a claim recitation of any kind, it is to be understood that additional elements, terms, etc., may be present without falling outside the scope of the corresponding claim or recitation. As used herein, when the phrase "at least" is used as the transition term in, for example, a preamble of a claim, it is open-ended in the same manner as the term "comprising" and "including" are open ended. The term "and/or" when used, for example, in a form such as A, B, and/or C refers to any combination or subset of A, B, C such as (1) A alone, (2) B alone, (3) C alone, (4) A with B, (5) A with C, (6) B with C, or (7) A with B and with C. As used herein in the context of describing structures, components, items, objects and/or things, the phrase "at least one of A and B" is intended to refer to implementations including any of (1) at least one A, (2) at least one B, or (3) at least one A and at least one B. Similarly, as used herein in the context of describing structures, components, items, objects and/or things, the phrase "at least one of A or B" is intended to refer to implementations including any of (1) at least one A, (2) at least one B, or (3) at least one A and at least one B. As used herein in the context of describing the performance or execution of processes, instructions, actions, activities and/or steps, the phrase "at least one of A and B" is intended to refer to implementations including any of (1) at least one A, (2) at least one B, or (3) at least one A and at least one B. Similarly, as used herein in the context of describing the performance or execution of processes, instructions, actions, activities and/or steps, the phrase "at least one of A or B" is intended to refer to implementations including any of (1) at least one A, (2) at least one B, or (3) at least one A and at least one B.

[0022] As used herein, singular references (e.g., “a”, “an”, “first”, “second”, etc.) do not exclude a plurality. The term “a” or “an” object, as used herein, refers to one or more of that object. The terms “a” (or “an”), “one or more”, and “at least one” are used interchangeably herein. Furthermore, although individually listed, a plurality of means, elements or method actions may be implemented by, e.g., the same entity or object. Additionally, although individual features may be included in different examples or claims, these may possibly be combined, and the inclusion in different examples or claims does not imply that a combination of features is not feasible and/or advantageous.

DETAILED DESCRIPTION

[0023] In recent years, standalone frames for supporting varieties of working surfaces have grown in popularity due to the ability to tailor the functionality and appearance of the adjustable frame and the working surface to individual needs. While standalone frames allow users to tailor their working areas, pre-made working surfaces come with pre-drilled holes in a variety of layouts and standalone frames are rarely compatible with working surfaces made by other manufacturers. As a result, users are often forced to drill their own holes into the working surfaces to enable the frame to connect to the working surface. This may cause unintended damage to the working surfaces and/or the frame and can result in uneven or unstable connections between the frame and the working surface, as well as a loss of structural integrity in the working surface. Certain examples provide adjustable frames to support working surfaces by allowing the user to align the frame to a variety of pre-drilled hole configurations on a variety of working surfaces. The adjustable frame can then be connected to a variety of working surfaces without a need for the user to drill new holes into the working surface. In some examples, the adjustable frame improves assembly efficiency and accuracy, as well as maintaining structural integrity of the working surfaces.

[0024] In certain examples, an adjustable frame includes a main frame with a plurality of legs (e.g., bars, columns, arms, etc.) that can support a first working surface (e.g., tabletop, table board, etc.) and a return frame, having a slider crossbar and a leg, to connect to the main frame and support a second working system. The adjustable frame may include a height adjustment system to enable height adjustment of the adjustable frame. The height adjustment system may be powered manually, such as using a lever that releases a pneumatic mechanism to allow the desk to be pushed to a desired position (common with desk converters) or a crank that moves the desk to various heights, and/or can be electronically driven, such as with an input interface having controls to allow the user to move the desk up or down or move the desk to saved heights using one or more motors. In certain examples, the adjustable frame with height adjustment system includes three retractable (e.g., telescopic) legs that are driven by three respective motors to raise or lower the adjustable frame.

[0025] The adjustable frame and associated working surface(s) can be implemented in a variety of configurations. For example, the adjustable frame can support two parallel working surfaces. In another configuration, the adjustable frame can support two perpendicular working surfaces (e.g., an L-shaped adjustable frame can support one or more working surfaces arranged in an L shape).

[0026] Examples disclosed herein enable manufacture of an adjustable frame (e.g., table frame, desk frame) that includes a sliding mechanism (e.g., assembly) configured to allow for adjustment of the return frame relative to the main frame. Example adjustable frames disclosed herein include a channel bracket to couple to the main frame and a slider to couple to the return frame to provide the sliding mechanism.

[0027] Example adjustable frames disclosed herein include telescoping legs. Example telescoping legs disclosed herein include actuators to enable lengthening and shortening of the telescoping legs to cause height adjustment of the example adjustable frame. As such, the height of the adjustable frame can be varied.

[0028] Example adjustable frames disclosed herein include a height adjustment system. Certain example height adjustment systems include a controller and a control panel to control the example height adjustment system. Example adjustable frames disclosed herein provide for synchronous height adjustment of three or more telescoping legs through the cooperation of the controller and the motors of the telescoping legs.

[0029] Certain example adjustable frames are configurable, enabling different arrangements of the adjustable frame. Such structural arrangement is not only convenient for installation and transportation, but also convenient for customers to install and use in different environments.

[0030] FIGS. **1**A-**1**B illustrate an example adjustable frame **100** to support a working surface (e.g., an adjustable table frame, an adjustable desk frame, etc.) structured in accordance with teachings of this disclosure to provide an angled adjustable frame to support one or more working surfaces (e.g., table tops, desk tops, etc.). The working surfaces themselves are not shown in the view of FIG. **1**A. FIG. **1**A is a perspective view of the example adjustable frame **100**, which includes an example main frame **102** (also referred to as a first frame) and an example return frame **104** (also referred to as a second frame) adjustably coupled to the main frame **102** via a sliding mechanism **106**. The adjustable frame **100** supports and positions the working surfaces with respect to a floor **108**. The floor **108** can be any suitable surface that can hold or otherwise support the adjustable frame **100** such as, but not limited to, the ground, a platform, hardwood floor, carpet, tile, etc.

[0031] The example main frame **102** of FIGS. **1**A-**1**B includes an example connection system **110** and two example legs **120** that carry and support the main frame **102**. The example legs **120** include an extendable portion **122**, a motor **124**, and a leg crossbar **126**. The example connection system enables connection of different components of the main frame **102**. For example, the connection system enables the two legs **120** to be connected as a whole, forming an integrated unit to support a working surface. In some examples, the connection system provides increased support for the legs **120**, more generally, the adjustable frame **100**, and/or a working surface. The connection system **110** of FIG. **1**A, components of which are illustrated in FIG. **1**B, includes a plurality of example crossbar(s) (e.g., cross beams, connection rods, etc.) **112** to connect the leg crossbars **126** of the legs **120**. However, the connection system can include more or less components and/or different components in additional or alternative examples.

[0032] The crossbars **112** of FIGS. **1**A-**1**B are configured to couple the legs **120** to form the main frame **102**. The example crossbars **112** are used to couple the leg crossbars **126** of the legs **120** and/or to provide increased structural support. In some examples, one set of crossbars **112** may extend to couple two legs **120**. In other examples, a first set of crossbars **112** may extend from a first leg **120** and a second set of crossbars **112** may extend from a second leg **120**, and a crossbar connector may couple the first and second sets of crossbars **112**. In some examples, the crossbars **112** and the leg crossbars **126** are telescopic such that the crossbars **112** can nest within a leg crossbar **126** of a first leg **120** at first ends of the crossbars **112** and within a leg crossbar **126** of a second leg **120** at second ends of the crossbars **112**, enabling different configurations of the adjustable frame **100** by adjustment of the crossbars **112**.

[0033] The example return frame **104** includes a slider crossbar **130**, an example connection system **114**, and a leg **120** that carry and support the return frame **104**. The slider crossbar **120** engages the connection system **114** and the sliding mechanism **106** (as shown in FIG. **1**B). The example connection system **114** of the return frame **104** of FIGS. **1**A-**1**B enables connection of different components (e.g., crossbars **116**) of the return frame **104** similar to the example connection system **110** of the main frame **102** described above. In some examples, the connection system **114** of the return frame **104** may be configured differently than the connection system **110** of the main frame **102**. For example, the connection system **110** may include two sets of crossbars **112** coupling a crossbar connector as described above and the connection system **114** may include only one set of crossbars **116**.

[0034] It is understood that the connection systems **110** and **114** can take on different configurations in other examples. In some examples, one or more components of the connection systems **110** and **114** may be integrally formed. In some examples, one or more components of the connection systems **110** and **114** may be omitted. Further, it is understood that the connection systems **110** and **114** may couple with the legs **120** in other configuration(s) to provide support to a working surface. In some examples, the legs **120** may not include leg crossbars **126**. In those examples, the connection systems **110** and **114** may connect to a different portion of the legs **120**.

[0035] FIG. **2** illustrates an example implementation of the sliding mechanism **106** to enable adjustment of the return frame **104** relative to the main frame **102**. The example sliding mechanism **106** includes an example channel bracket **200** and an example slider (e.g., rail) **210**. The example channel bracket **200** includes a plate **202** to connect to the leg crossbar **126** of a leg **120** of the main frame **102**. As shown in more detail in FIG. **3**A, the plate **202** and the leg crossbar **126** connect via screws, aligning the holes **208** of the channel bracket **200** with the holes **210** of the leg crossbar **126**. The example channel bracket **200** also includes top and bottom lips (e.g., overhangs, ledges) **204**, the plate **202** and the lips **204** providing a slot **206**.

[0036] The example slider **220** includes a plate **222** to connect to a plate **230** of the slider crossbar **130** of the return frame **104**. The example slider **220** also includes arms **224** configured to fit the slot **206** of the channel bracket **200**. As shown in more detail in FIG. **3**B, the slider **220** sits within the slot **206** of the channel bracket **200**. The plate **230** of the slider crossbar **130** is connected to the plate **222** of the slider **220** via screws, aligning the holes **232** of the slider crossbar **130** with the holes **226** of the slider **220**, such that the lips **204** of the channel bracket **200** sit between the plate **230** of the slider crossbar **130** and the arms **224** of the slider **220**. Thus, the slider crossbar **130**, the slider **220**, and the channel bracket **200** provide a clamping mechanism.

[0037] The screws joining the slider crossbar **130** and the slider **220** can be tightened a sufficient amount to fix the slider crossbar **130** to the slider **220**, but not enough to cause the plate **230** of the slider crossbar **130** and the arms **224** of the slider **204** to clamp down on the lips **204** of the channel bracket **200**. This allows the arms **224** of the slider **204** to slide within the slot **206** of the channel bracket **200**. Therefore, the slider crossbar **130** and the slider **220** can slide relative to the channel bracket **200** and, as a result, the return frame **104** can slide relative to the main frame **102** along the slot **206** provided by the channel bracket **200**. When the screws joining the slider crossbar **130** and the slider **220** are tightened further, the plate **230** of the slider crossbar **130** and the arms **224** of the slider **220** clamp down on the lips **204** of the channel bracket **200**, restricting the movement of the slider crossbar **130** and the slider **220** relative to the channel bracket **200** and, therefore, restricting the movement of the return frame **104** relative to the main frame **102**.

[0038] It is understood that the channel bracket **200** and the slider **220** can have different configurations in other examples. For example, the channel bracket **200** and the slider **220** may have different shapes (e.g., the channel bracket **200** may provide a curved slot and the slider **220** may be shaped to engage the curved slot, the slider **220** may be a simple rectangular prism to fit within the slot **206**, etc.). Further, it is understood that the channel bracket **200** and the slider **220** may have other configurations that also enable connection of the return frame **104** to the main frame **102** to allow sliding of the return frame **104** relative to the main frame **102** and provide a mechanism to restrict movement of the return frame **104** relative to the main frame **102**. For example, the channel bracket **200** may connect to the return frame **104**, and the slider may connect to the main frame **102**.

[0039] The example slider **220** is composed of cast aluminum but may be any other suitable material capable of retaining its shape and durable enough to withstand the forces inherent in the sliding mechanism **106** as described herein. The example channel bracket **200** is composed of powder-coated steel but may be any other suitable material capable of retaining its shape and durable enough to withstand the forces inherent in the sliding mechanism **106** as described herein.

[0040] Returning to FIGS. **1**A-**1**B, the example legs **120** of the main frame **102** and the return frame **104** include an extendable portion **122**, a motor **124**, and a leg crossbar **126**. As shown in the example of FIGS. **1**A-**1**B, the example extendable portions **122** are implemented as telescoping columns (e.g., retractable legs, lift columns, etc.), but can be implemented as another structure that can hold or otherwise support the main frame **102**. The extendable portions **122** of FIGS. **1**A-**1**B are vertical columns positioned substantially orthogonal (e.g., approximately 90 degrees) relative to the floor **108** but may be associated with an angle in some examples. Each extendable section **122** includes two or more example telescoping leg sections, such as an example upper (e.g., inner) section **122**U, an example middle section **122**M, and an example lower (outer) section **122**L. Such a configuration enables the upper section(s) **122**U and middle section(s) **122**M of the extendable portions **122** to slide relative to the lower section(s) **122**L, allowing the extendable portion(s) **122** to change length.

[0041] The example adjustable frame **100** includes an example height adjustment system **134**, which is configured to cause the legs **120** to rise or fall substantially simultaneously (e.g., concurrently, all together, at the same time accounting for some delay in human reaction or motorized movement) to adjust the height **140** of the adjustable frame **100** (e.g., from a sitting height to a standing height or vice versa). The height adjustment system **134** includes a plurality of example motors **124** and a plurality of actuators (e.g., actuator(s) **160**). The motors **124** drive the actuators **160** which generate linear motion to lengthen and shorten the extendable portions **122** of the legs **120**.

[0042] In some examples, the motors **124** are silent motors to reduce an amount of noise generated by the adjustable frame **100** during operation. In other examples, the height adjustment system **134** may include a single motor **124** coupled to a gear assembly to drive the actuators to increase or decrease the height **140** of the adjustable frame **100**.

[0043] Each of the legs **120**A-C includes or otherwise implements a respective actuator **160**. In some examples, the lower section(s) **122**L of the legs **120**A-C are configured to implement the actuators **160** and the upper section(s) **122**U of the legs **120**A-C implement cover(s) for the actuators **160**. For example, each lower section(s) **122**L may include a lead screw assembly that converts rotational motion provided by a gear assembly into linear motion that drives the top ends **122** of the legs **120**A-C in an upward or downward direction while the bottom ends **124** of the legs **120**A-C remain stationary. As the legs **120**A-C raise or lower, a working surface coupled to the legs **120**A-C raise or lower accordingly.

[0044] It is understood that the legs **120** can take on different configurations in other examples. In some examples, the legs **120** may have a fixed height and the extendable portions **122** may be of a fixed length. In those examples, the height adjustment system **134** and included components may be omitted. In those examples, the legs **120** may omit extendable portions **122**. In other examples, the legs **120** may be of a different style (e.g. foldable, hairpin, etc.)

[0045] In the illustrated example of FIG. **1**A, the legs **120** are arranged in an L-shaped format to provide support for the adjustable frame **100**. For example, an example first leg **120**A and an example second leg **120**B of the three legs **120** may be positioned at example end points **150** of the adjustable frame **100** and an example third leg **120**C of the legs **120** may be positioned at an example point of interconnection **152** (e.g., interconnection point). In some examples, the first leg **120**A implements an example first end point **150**A. In some examples, the second leg **120**B implements an example second end point **150**B. In some examples, the third leg **120**C implements the point of interconnection **152**.

[0046] In some examples, the lower section **122**L of the leg **120**C at the point of interconnection **152** defines an example set of coordinates **153** that includes the x-axis X, the y-axis Y, and the z-axis Z. In illustrated examples the z-axis is defined to run parallel relative to a length of the lower section **122**L of the leg **120**C. The x-axis is defined to run parallel to a direction of the point of interconnection **152** to the first end point **150**A, and the y-axis is defined to run parallel to a direction of the point of interconnection **152** to the second end point **150**B. However, the coordinates **153** may be defined differently in additional or alternative examples.

[0047] The end points **150**A, **150**B extend in different directions relative to the point of interconnection **152** such that the adjustable frame **100** defines a substantially right angle (e.g., approximately 90 degrees). Such an arrangement enables a working surface to be larger relative to traditional desks with two legs, enabling higher space utilization. For example, positioning the adjustable frame **100** in a corner of a room can increase an amount of leg space under a working surface and an amount of workspace on a working surface. However, the adjustable frame **100** can be configured in other structural forms apart from the L-shape. For example, the adjustable frame **100** can include more or fewer legs **120** as needed or desired to increase or decrease the area of a working surface to be placed on the adjustable frame **100** (e.g., 2 legs, 4 legs, 5 legs, etc.). In some examples, the adjustable frame **100** can define a different angle (e.g., an acute angle, an obtuse angle) and/or be associated with another shape (e.g., a T-shape, an H-shape, etc.).

[0048] Each leg **120**A-C includes an example first (e.g., top) end **122** (illustrated in FIGS. **1**B and **1**C) that is to interface with a working surface and an example second (e.g., bottom) end **124** (illustrated in FIG. **1**C) that is to interface with the floor **108**. In some examples, the bottom end(s) **124** is provided with example an example base support(s) **126** such as (but not limited to) a foot, a foot pad, a castor wheel, etc., at least in part to increase a level of stability of the adjustable frame **100**. The base support(s) **126** may be positioned between the second end(s) **124** of the leg(s) **120**A-C and the floor **108**. In some examples, the base support(s) **126** may be coupled to or otherwise include an additional base support(s) **126**. For example, a base support(s) **126** in the form of a foot may include a pad(s) to prevent or otherwise limit damage to the floor **108** or a castor(s) to enable easy transport of the adjustable frame **100** from a first location to a second location.

[0049] The adjustable frame **100** is associated with an example frame height **140** (illustrated in FIG. **1**A) measured from a first (e.g., bottom or lower) endpoint of the leg(s) **120**A-C (e.g., a bottom end **124** of the leg(s) **120**, a bottom of a base support **126**, etc.) to a second (e.g., top or higher) endpoint of the leg(s) **120**A-C (e.g., a top end **122** of the leg(s) **120**, a top of a side bracket **128**, etc.). The legs **120**A-C are associated with an example length **142** (illustrated in FIG. **1**B) defined by a distance between the first ends **122** and respective second ends **124**. Thus, the frame height **140** of the adjustable frame **100** at a given moment in time may correspond to a length **142** of the legs **120**A-C at the moment of time plus the vertical size of a base support(s) **126**. The extendable portions **122** of the legs **120**A-C are adjustable columns. As noted above, each extendable portion **122** of legs **120**A-C includes two or more telescoping leg sections **122**U, **122**M, and **122**L that enable the extendable portions **122** to extend and retract to change in length **142** and raise or lower the adjustable frame **100**. The height adjustment of the adjustable frame **100** is implemented by simultaneously (or at least substantially simultaneously, accounting for some delay in human reaction or motorized movement) changing the lengths **142** of the legs **120**.

[0050] FIG. **4**A illustrates the example adjustable frame **100** of FIGS. **1**A-**1**B with example working surfaces **402**, **404** fixed thereto. The example main frame **102** connects to example working surface **402** (e.g., first working surface) and example return frame **104** connects to example working surface **404** (e.g., second working surface). The example adjustable frame **100** connects to the working surfaces **402** and **404** via screws connecting various components of the example adjustable frame **100** to the working surfaces **402** and **404**. For example, the example side brackets **128** of legs **120**, example leg crossbars **126** of legs **120**, and example slider crossbar **130** are configured to be screwed to the working surfaces **402** and **404**. The example adjustable frame **100** includes connecting plates **406** to join working surface **402** and working surface **404** together.

[0051] Example working surfaces **402** and **404** are rectangular with filleted corners and of similar shape and size, however the adjustable frame **100** may be configured to connect to working surfaces of varying shapes (e.g., triangular, circular, etc.) and sizes. In some examples, working surface **402** and working surface **404** may be a single working surface.

[0052] The example adjustable frame **100** of FIG. **4**A is configured in a left-sided configuration. The sliding mechanism **206** connects to the left side of the leg crossbar **126** of leg **120**C of the main frame **102**, when viewed from above the upright working frame **100** along the x-axis. The example adjustable frame **100** of FIG. **4**B is configured in a right-sided configuration. The sliding mechanism **206** connects to the right side of the leg crossbar **126** of the leg **120**C of the main frame **102**, when viewed from above the upright working frame **100** along the x-axis.

[0053] In the example adjustable frame **100** of FIGS. **4**A-**4**B, the height adjustment system **134** includes an example controller **408**, which may be communicatively coupled to the motors **124**. For example, the controller **408** may be in communication with the motors **124** through a wired connection as shown in FIG. **5** and/or wireless (e.g., BLUETOOTH®, WIFI, cellular, etc.) connection. The controller **408** is configured to control the motors **124** to control the height **140** of the adjustable frame **100**. The height adjustment system **134** of FIGS. **4**A-**4**B includes a control panel **410** that allows a user to control the height **140** of the adjustable frame **100**, as discussed below in relation to FIG. **6**. In other examples, the controller **408** may include an input interface, such as a touch screen, buttons, etc., that allow a user to control the height **140** of the adjustable frame **100**.

[0054] FIG. **5** illustrates an example wired connection system **500**. The example wired connection system **500** includes an example wire **502** connecting the example controller **408** to a power supply (not shown in the view of FIG. **5**). The example wires **504** connect the example controller **408** to the example motors **124** of the legs **120**. The example wires **506** connect the example controller **408** to the example control panel **410**. The wired connection system **500** allows the motor **124** to communicatively couple the other components of the wired connection system **500**.

[0055] FIG. **6** illustrates an example user interface of an example control panel **410**. The control panel **410** includes an upward movement button **600** and a downward movement button **602** which allow the user to adjust the height **140** of the example adjustable frame **100** up or down. The example control panel **410** includes a display **604** to display to the user the height **140** of the adjustable frame **100**. The example control panel **410** also includes a memory button **606** that allows the user to save the current height **140** of the adjustable frame **100** to memory preset buttons **608**. The user may then press one of memory preset buttons **608** to automatically adjust the height **140** of the adjustable frame **100** to the saved height assigned to that button. The example control panel **410** has 4 memory presets but may include more or less memory presets. In some examples, the control panel **410** may omit some components entirely.

[0056] FIG. **7** illustrates an example method **700** of constructing the adjustable frame **100**. At step **701**, the user constructs the main frame **102** of the adjustable frame **100** and connects it to the working surface **402**. The user then determines whether the adjustable frame **100** will be in the left-sided or right-sided configuration of FIGS. **4**A-**4**B. For left-sided configurations, the user connects the channel bracket **200** to the left side of the leg crossbar **126** of leg **120**C in step **703**A. For right-sided configurations, the user connects the channel bracket **200** to the right side of the leg crossbar **126** of leg **120**C in step **703**B. In step **704**, the user connects the slider crossbar **130** and the slider **220**, leaving room such that the slider crossbar **130** and the slider **220** can still slide relative to the channel bracket **200**. In step **706**, the user connects the rest of the return frame **104** to the slider crossbar **130**. In step **707**, the user aligns the return frame **104** with the working surface **404** and connects them. Finally, in step **708**, the user tightens the connection of the slider crossbar **130** and the slider **220**, such that the slider crossbar **130** and the slider **220** can no longer slide relative to the channel bracket **200**.

[0057] Systems, apparatus, articles of manufacture, and methods disclosed herein allow users to connect an adjustable frame to a variety of working surfaces by aligning the adjustable frame to various pre-drilled hole configurations. Users can avoid drilling their own holes into working surfaces, as they have with existing frames, which can cause unintended damage to the working surfaces and/or the frame and result in uneven or unstable connections between the frame and the working surface and/or a loss of structural integrity in the working surface. The following claims are hereby incorporated into this Detailed Description by this reference. Although certain example systems, apparatus, articles of manufacture, and methods have been disclosed herein, the scope of coverage of this patent is not limited thereto. On the contrary, this patent covers all systems, apparatus, articles of manufacture, and methods fairly falling within the scope of the claims of this patent.

Claims

1. A frame comprising: a first frame including a leg; a second frame; and a sliding mechanism connected to the first frame and the second frame, the sliding mechanism including: a channel bracket having a slot; and a slider configured to move within the slot.
2. The frame of claim 1, the leg having a first side and a second side opposite the first side, first and second sides of the leg configured to connect to the sliding mechanism.
3. The frame of claim 2, wherein the sliding mechanism connects to the first side of the leg.
4. The frame of claim 2, wherein the sliding mechanism connects to the second side of the leg.
5. The frame of claim 1, wherein the first frame is connected to a first working surface.
6. The frame of claim 1, wherein the second frame is connected to a second working surface.
7. The frame of claim 1, the channel bracket including a plate and lips, the plate and the lips providing the slot.
8. The frame of claim 1, the slider including a plate and arms, the arms to engage the slot.
9. The frame of claim 1, wherein the channel bracket is powder-coated steel and the slider is cast aluminum.
10. The frame of claim 1, wherein the channel bracket is connected to the first frame, and the slider is connected to the second frame.
11. The frame of claim 10, wherein the connection between the slider the second frame is tightened, restricting movement of the slider within the slot.
12. The frame of claim 10, the second frame including a crossbar, the slider connected to the crossbar.
13. The frame of claim 12, the first frame including a first leg and a second leg connected to the first leg, the second frame further including a third leg connected to the crossbar.
14. The frame of claim 13, wherein the crossbar is a first crossbar, the second leg connected to the first leg via second crossbars, the third leg connected to the first crossbar via third crossbars.
15. The frame of claim 13, wherein the first leg includes a first motor to increase or decrease a first height of the first leg, the second leg includes a second motor to increase or decrease a second height of the second leg, and the third leg includes a third motor to increase and decrease a third height of the third leg.
16. The frame of claim 15, further including a controller connected to the first, second, and third motors, the controller to adjust a fourth height of the frame.
17. The frame of claim 16, further including a control panel coupled to the controller, the control panel to receive an input from a user to increase or decrease the respective first, second, and third heights of the first, second, and third legs, and the controller to execute the input by driving the first, second, and third motors.
18. The frame of claim 17, the controller including a memory to store at least one saved height of the frame, the control panel to receive an input from the user to save the fourth height of the frame in the memory, and the controller to execute the input.
19. An adjustable desk frame comprising: a first frame having a first leg and a second leg; a second frame having a third leg and a crossbar; and a sliding mechanism connecting the second leg and the crossbar, including: a channel bracket having a plate and lips providing a slot, the channel bracket connected to the second leg; and a slider within the slot, the slider connected to the crossbar, wherein the slider is to slide within the slot when the connection between the slider and the crossbar is tightened to a first stage and wherein the slider and the crossbar are to clamp the lips of the channel bracket when the connection is tightened to a second stage, such that the slider can no longer slide within the slot of the channel bracket.

20. The adjustable desk frame of claim 19, wherein the first leg includes a first motor to increase or decrease a first height of the first leg, the second leg includes a second motor to increase or decrease a second height of the second leg, and the third leg includes a third motor to increase and decrease a third height of the third leg, and further including a controller connected to the first, second, and third motors, the controller to adjust a fourth height of the adjustable desk frame.