ADJUSTABLE SUPPORT ARM

BACKGROUND OF THE INVENTION

Adjustable support arms allow mounted objects such as electronic displays, keyboards, or other items to be moved to the appropriate ergonomic position relative to the user. By enabling users to align the monitor at the correct height for them, adjustable support arms encourage a healthier, more ergonomic working posture which helps prevent eye and neck strain. Additionally, they preserve precious workspace by floating the monitor above the user's work surface.

In today's modern workplace, adjustable support arms must provide users with a wide range of height, depth, and angle adjustments. For example, when changing from a seated position to a standing position at height-adjustable desks, users oftentimes will desire that the monitor, keyboard and other equipment be at adjusted to different positions. Similarly, where the concept of hot-desking is employed in the workplace, a given workstation must be capable of accommodating different users of different sizes throughout the workday. Accordingly, an adjustable support arm offering improved adjustability over a wide range of travel would be beneficial.

SUMMARY OF THE INVENTION

According to a first aspect of the present invention, there is provided an adjustable support arm including: a) a base assembly; and b) an arm assembly releasably coupled to the base assembly; c) an adjustable panning insert positioned between the arm assembly and the base assembly, wherein the adjustable panning insert comprises an outer wall, an inner wall, a first end, a second end, and wherein the adjustable panning insert further comprises: first and second splines positioned in a stacked orientation around the inner wall of the adjustable panning insert; and first and second projections extending from the second end of the adjustable panning insert, wherein the first projection is spaced apart from the second projection.

According to a second aspect of the present invention, there is provided an adjustable support arm including an arm assembly, the arm assembly including: a) a base mounted to a work surface; b) a first arm comprising a first end and a second end, wherein the first end is coupled to the base; c) a second arm comprising a first end, a second end, and a parallelogram linkage and being mated to the second end of the first arm, d) a mounting plate mated to the second end of the second arm; e) an accessory bracket assembly attached to the mounting plate; f) a removable, adjustable panning insert positioned between the first arm and the second arm, wherein the panning insert limits the rotation of the second arm about an axis formed between the first and second arms, wherein the second end of the first arm comprises a housing adapted to receive the adjustable panning insert, the housing including: a) a channel formed in an second end of the first arm, the channel defining an outer wall and an inner wall; and b) a spline having a plurality of teeth and one or more pockets, wherein the spline is positioned along the outer periphery of the inner wall such that the plurality of teeth extend laterally from the inner wall and partially into the channel for mating with either first or second splines of the adjustable panning insert, and wherein the one or more pockets are adapted to receive and mate with first and second projections of the adjustable panning insert.

~~According to a third aspect of the present invention, there is provided~~Disclosed herein is an adjustable support arm including: a) a base assembly; b) an arm assembly, the arm assembly including: i) a first arm comprising a first end and a second end, wherein the first end of the first arm is releasably coupled to the base assembly; ii) a second arm releasably coupled to the second end of the first arm, the second arm comprising a parallelogram linkage having a first end pivotally attached to a lower bracket and a second end pivotally attached to an upper bracket; and c) a first adjustable panning insert positioned between the first arm and the base assembly to limit rotation of the first arm about the base; and d) a second adjustable panning insert positioned between the second arm and the first arm to limit rotation of the second arm about the first arm.

Embodiments of the invention disclosed herein are generally directed to an adjustable support arm capable of providing users with a wide range of height, depth, tilt, and swivel options for the side-to-side, front-to-back, and up-to-down movements that the modern workspace requires. An adjustable support arm exemplifying the principles of the present invention can comprise one or more of the following features: a quick-release joint for enabling easy removal and attachment of the arm assembly to the base assembly; a friction cartridge assembly for connecting the arm assembly to the base assembly in a manner which reduces slack in the joint; an adjustable panning insert for adjusting the side-to-side range of motion of the support arm; a bearing positioned in the hub of the base assembly for reducing the amount of force required to adjust the side-to-side motion of the support arm as well as the amount of force required to detach the arm assembly from the base assembly; a quick-release accessory fastening mechanism for easy removal and attachment of a mounted accessory (e.g., an electronic display, keyboard, or other object) to the support arm; and an accessory

CLAIMS

1. An adjustable support arm comprising:

a) a base assembly; and

b) an arm assembly releasably coupled to the base assembly;

c) an adjustable panning insert positioned between the arm assembly and the base assembly, wherein the adjustable panning insert comprises an outer wall, an inner wall, a first end, a second end, and wherein the adjustable panning insert further comprises: first and second splines positioned in a stacked orientation around the inner wall of the adjustable panning insert; and first and second projections extending from the second end of the adjustable panning insert, wherein the first projection is spaced apart from the second projection.

2. The adjustable support arm of claim 1, wherein the base assembly comprises a housing adapted to receive the adjustable panning insert, the housing comprising:

a) a channel formed in an upper end of the housing, the channel defining an outer wall and an inner wall; and

b) a spline having a plurality of teeth and one or more pockets, wherein the spline is positioned along the outer periphery of the inner wall such that the plurality of teeth extend laterally from the inner wall and partially into the channel for mating with either the first or second splines of the adjustable panning insert, and wherein the one or more pockets are adapted to receive and mate with the first and second projections of the adjustable panning insert.

3. The adjustable support arm of claim 2, wherein the arm assembly comprises:

a) a central chamber; and

b) a groove adjacent to the central chamber and having an anterior portion and a posterior portion, and

c) a stop positioned within the groove.

4. The adjustable support arm of claim 3, wherein the adjustable panning insert is coupled to the housing of the base assembly in an orientation selected from ~~the~~a group consisting of:

a) A first orientation defined by the second spline and the one or more pockets of the adjustable panning insert being mated to the spline formed in the channel of the base assembly such that the first and second projections of the adjustable panning insert extend into the one or more pockets of the spline formed in the housing of the base assembly;

b) A second orientation defined by the first spline of the adjustable panning insert being mated to the spline formed in the channel of the base assembly housing such that the first and second projections of the adjustable panning insert extend into the groove; and

c) A third orientation defined by the first spline of the adjustable panning insert being mated to the spline formed in the channel of the base assembly such that the first and second projections of the adjustable panning insert extend into the posterior portion of the groove.

5. The adjustable support arm of claim 4, wherein the stop is positioned within the anterior portion of the groove.

6. The adjustable support arm of claim 4, wherein the stop is positioned within the posterior portion of the ~~annular~~ groove.

7. The adjustable support arm of claim 4, wherein the first projection is spaced apart from the second projection along a circumference of the second end of the adjustable panning insert by approximately 90° as measured in a first direction along the circumference.

8. The adjustable support arm of claim 4, wherein the base assembly comprises a base plate adapted to be positioned on the top of a work surface, a post extending upward from the base plate, a clamp bracket attached to the base plate and extending below the work surface, and a screw threadingly engaged with the clamp bracket.

9. The adjustable support arm of claim 8, wherein the housing is formed in an upper end of the post of the base assembly.

10. The adjustable support arm of claim 9, wherein the arm assembly comprises a dynamic arm, wherein the dynamic arm comprises a parallelogram linkage having a first end pivotally attached to a lower bracket and a second end pivotally attached to an upper bracket.

11. The adjustable support arm of claim 10, wherein the central chamber and groove are formed in the lower bracket of the dynamic arm.

12. The adjustable support arm of claim 4, wherein the adjustable support arm further comprises a connector shaft connecting the arm assembly to the base assembly, wherein a first end of the connector shaft is positioned within ~~the~~a central bore of the base assembly, and wherein a second end of the connector shaft is positioned within the central chamber of the arm assembly.

13. The adjustable support arm of claim 12, wherein the adjustable support arm further comprises a quick-release joint for releasably connecting the arm assembly to the base assembly, the quick-release joint comprising:

a) a latch comprising a protrusion;

b) an axle extending through an aperture formed in the latch to pivotally connect the latch to the base assembly, the axle defining a fulcrum about which the latch pivots;

c) a spring biasing the protrusion into engagement with an indentation formed in the first end of the connector shaft.

14. The adjustable support arm of claim 13, wherein the adjustable support arm further comprises a bearing positioned within the housing of the base assembly and operatively engaging the connector shaft.

15. The adjustable support arm of claim 14, wherein the adjustable support arm further comprises an articulating joint connected to the arm assembly, the articulating joint comprising:

a) a swivel ring pivotally attached to the arm assembly;

b) a tilt ring attached to the swivel ring; and

c) a mounting plate pivotally attached to the tilt ring, the mounting plate further comprising a fastening mechanism, wherein the fastening mechanism comprises: a spring-loaded latch positioned within a cut-out formed in a lower portion of the mounting plate; and a hook protruding from a front side of an upper portion of the mounting plate.

16. The adjustable support arm of claim 15, wherein the adjustable support arm further comprises an accessory bracket assembly releasably attached to the mounting plate of the articulating joint, wherein the accessory bracket assembly comprises:

a) a central bracket;

b) a frame disposed around the central bracket and attached thereto;

c) a first mounting piece attached to the frame; and

d) an accessory support having a first end coupled to the first mounting piece.

~~17. An adjustable support arm comprising an arm assembly, the arm assembly comprising:~~

~~a) a base mounted to a work surface;~~

~~b) a first arm comprising a first end and a second end, wherein the first end is coupled to the base;~~

~~c) a second arm comprising a first end, a second end, and a parallelogram linkage and being mated to the second end of the first arm,~~

~~d) a mounting plate mated to the second end of the second arm;~~

~~e) an accessory bracket assembly attached to the mounting plate;~~

~~f) a removable, adjustable panning insert positioned between the first arm and the second arm, wherein the panning insert limits the rotation of the second arm about an axis formed between the first and second arms.~~

~~18~~17. ~~The adjustable support arm of claim 17~~An adjustable support arm comprising an arm assembly, the arm assembly comprising:

a) a base mounted to a work surface;

b) a first arm comprising a first end and a second end, wherein the first end is coupled to the base;

c) a second arm comprising a first end, a second end, and a parallelogram linkage and being mated to the second end of the first arm,

d) a mounting plate mated to the second end of the second arm;

e) an accessory bracket assembly attached to the mounting plate;

f) a removable, adjustable panning insert positioned between the first arm and the second arm, wherein the panning insert limits the rotation of the second arm about an axis formed between the first and second arms,

wherein the second end of the first arm comprises a housing adapted to receive the adjustable panning insert, the housing comprising:

a) a channel formed in an second end of the first arm, the channel defining an outer wall and an inner wall; and

b) a spline having a plurality of teeth and one or more pockets, wherein the spline is positioned along the outer periphery of the inner wall such that the plurality of teeth extend laterally from the inner wall and partially into the channel for mating with either ~~the~~ first or second splines of the adjustable panning insert, and wherein the one or more pockets are adapted to receive and mate with ~~the~~ first and second projections of the adjustable panning insert.

~~19~~18. The adjustable support arm of claim ~~18~~17, wherein ~~the~~a lower bracket of the second arm comprises:

a) a central chamber; and

b) a groove adjacent to the central chamber and having an anterior portion and a posterior portion, and

c) a stop positioned within the groove.

~~20~~19. The adjustable support arm of claim ~~19~~18, wherein the adjustable panning insert is coupled to the housing of the first arm in an orientation selected from ~~the~~a group consisting of:

a) A first orientation defined by the second spline and the one or more pockets of the adjustable panning insert being mated to the spline formed in the channel of the first arm;

b) A second orientation defined by the first spline of the adjustable panning insert being mated to the spline formed in the channel of the first arm such that the first and second projections of the adjustable panning insert extend into the anterior portion of the ~~annular~~ groove formed in the lower bracket of the second arm; and

c) A third orientation defined by the first spline of the adjustable panning insert being mated to the spline formed in the channel of the first arm such that the first and second projections of the adjustable panning insert extend into the posterior portion of the groove formed in the lower bracket of the second arm.

~~21~~20. The adjustable support arm of claim ~~20~~19, wherein the stop is positioned within the anterior portion of the ~~annular~~ groove.

~~22~~21. The adjustable support arm of claim ~~20~~19, wherein the stop is positioned within the posterior portion of the ~~annular~~ groove.

~~23~~22. The adjustable support arm of claim ~~20~~19, wherein the first projection is spaced apart from the second projection along a circumference of the second end of the adjustable panning insert by approximately 90° as measured in a first direction along the circumference.

~~24~~23. The adjustable support arm of claim ~~20~~19, wherein the adjustable support arm further comprises a connector shaft connecting the second arm to the first arm, wherein a first end of the connector shaft is positioned within the channel of the first arm, and wherein a second end of the connector shaft is positioned within the central chamber of the lower bracket of the second arm.

~~25~~24. The adjustable support arm of claim ~~24~~23, wherein the adjustable support arm further comprises a quick-release joint for releasably connecting the second arm to the first arm, the quick-release joint comprising:

a) a latch comprising a protrusion;

b) an axle extending through an aperture formed in the latch to pivotally connect the latch to the second end of the first arm, the axle defining a fulcrum about which the latch pivots;

c) a spring biasing the protrusion into engagement with an indentation formed in the first end of the connector shaft.

~~26~~25. The adjustable support arm of claim ~~25~~24, wherein the adjustable support arm further comprises an articulating joint connected to the arm assembly, the articulating joint comprising:

a) a swivel ring pivotally attached to the arm assembly;

b) a tilt ring attached to the swivel ring; and

c) a mounting plate pivotally attached to the tilt ring, the mounting plate further comprising a fastening mechanism, wherein the fastening mechanism comprises: a spring-loaded latch positioned within a cut-out formed in a lower portion of the mounting plate; and a hook protruding from a front side of an upper portion of the mounting plate.

~~27~~26. The adjustable support arm of claim ~~26~~25, wherein the adjustable support arm further comprises an accessory bracket assembly releasably attached to the mounting plate of the articulating joint, wherein the accessory bracket assembly comprises:

a) a central bracket;

b) a frame disposed around the central bracket and attached thereto;

c) first and second mounting pieces attached to opposing sides of the frame; and

d) an accessory support having a first end coupled to the first mounting piece and a second end coupled to the second mounting piece.

~~28. An adjustable support arm comprising:~~

~~a) a base assembly;~~

~~b) an arm assembly, the arm assembly comprising:~~

~~i) a first arm comprising a first end and a second end, wherein the first end of the first arm is releasably coupled to the base assembly;~~

~~ii) a second arm releasably coupled to the second end of the first arm, the second arm comprising a parallelogram linkage having a first end pivotally attached to a lower bracket and a second end pivotally attached to an upper bracket; and~~

~~c) a first adjustable panning insert positioned between the first arm and the base assembly to limit rotation of the first arm about the base; and~~

~~d) a second adjustable panning insert positioned between the second arm and the first arm to limit rotation of the second arm about the first arm.~~