A computer support is attachable to a chair. The computer support has a top support means, a first pivoting means, and an alignment means. The top support means has a first surface joined to a second surface. The first pivoting means allows at least partial rotation movement of the top support about a first pivot point. The alignment means moves at least a portion of the computer support along a horizontal plane. A frame means attaches the top support means to a chair. The computer support provides a first use position mounted to an external body and a lap use position separated from an external body.
COMPUTER MOUSE AND KEYBOARD SUPPORT WITH CHAIR ATTACHMENT AND LAP SYSTEM

CROSS-REFERENCE TO RELATED APPLICATIONS


TECHNICAL FIELD

[0002] This invention relates to a computer support system attachable to a chair or desk and that allows the user seated in a chair to comfortably operate a standard computer keyboard/mouse pad or other electronic devices. The system is also removable from the chair or desk to provide support in a lap use environment.

BACKGROUND OF THE INVENTION

[0003] Traditionally, computer components are arranged on a desktop. The computer keyboard rests on the desk in front of the computer monitor. Alternatively, some computer desks include special keyboard locations, such as retractable surface. The retractable surfaces are mounted to the desktop’s underside. Usually, this under-mounted support surface slides in and out on a set of guides/tracks/channels/slots.

[0004] Another method of supporting a keyboard includes a support surface mounted with a single a single arm generally located in the center of the desk but sometimes offset from the center. These permanently attached under-mount systems are popular with the computer users.

[0005] With the advent of wireless computer keyboards and mice, a need has developed for a mobile or portable support surface for these items. Although these wireless components/devices are portable, the traditional desk or slide-out under-mounted support surfaces are not. This leaves the user limited options on how and where to rest these components.

[0006] Take for example the resting place options for a mobile laptop computer. Laptops are generally supported on a desktop or other type of permanent surface, in the user’s hands, in the user’s lap, or balanced across the user’s knees. The posture required to use a laptop supported in these ways is often uncomfortable and unnatural. Furthermore, outside of the mini-mouse pad provided on laptops, no solid support surface is provided for the use of the traditional full-sized mouse, which is still preferred used along side a laptop computer.

[0007] The present invention is provided to solve the problems discussed above and other problems, and to provide advantages and aspects not provided by prior desk systems. A full discussion of the features and advantages of the present invention is deferred to the following detailed description, which proceeds with reference to the accompanying drawings.

SUMMARY OF THE INVENTION

[0008] An object of the present invention is to provide a computer support attachable to an external body. The computer support comprises: a first use position wherein the computer support is attached to the external body; and a second use position wherein the computer support is separated from the external body and is adapted to fit on a user’s lap to support an electronic device.

[0009] Another object of the present invention is to provide a computer support attachable to an external body. The computer support comprises: a top support means comprising a first surface and a second surface, said first surface joined to said second surface; a first pivoting means for at least partial rotational movement of said top support about a first pivot point; an alignment means for moving at least a portion of the computer support along a horizontal plane; and a frame means for attaching said top support means to the external body.

[0010] Another object of the present invention is to provide a computer support that provides a variable workspace for a user. The computer support comprises: first surface positioned along a first substantially horizontal plane; a second surface offset from and located on a separate horizontal plane than said first surface; and a pin joining said first surface and said second surface, said pin defining a pivot point upon which said first surface is pivotally mounted to said second surface for rotational movement about said pivot point along said first substantially horizontal plane.

[0011] Another object of the present invention is to provide a computer support for selective attachment to an external body. The computer support comprises: a top support comprising a first surface and a second surface, said first surface located on a separate horizontal plane than said second surface, said first surface having a first guide therein; a first pin joining said first surface with said second surface and positioned within the first guide, said first pin defining a first pivot point upon which relative rotational movement between said first surface and said second surface bring said first surface and said second surface into selective substantially parallel alignment; a second guide extending along a portion of said top support, said pin also located within said second guide wherein traverse of said first pin within said second guide brings said first surface into selective substantially vertical alignment with said second surface; a second pin between said first surface and said second surface; and a third guide having a curvilinear shape, said second pin adapted to traverse along a length of said third guide wherein said first surface may be selectively rotated about said pivot point and traversed in a plurality of directions.

[0012] Other embodiments, systems, methods, features, and advantages of the present invention will be, or will become, apparent to one having ordinary skill in the art upon examination of the following drawings and detailed description. It is intended that all such additional systems, methods, features, and advantages be within the scope of the present invention, and can be protected by the accompanying claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[0013] The invention may be better understood with reference to the following drawings. The components in the drawings are not necessarily to scale, emphasis instead being placed upon illustrating the principles of the invention. In the drawings, like reference numbers designate corresponding parts throughout.

[0014] FIG. 1 is a perspective view of a computer support system attached to a chair.

[0015] FIG. 2 is a front view of a computer support system attached to a chair;
FIG. 3 is a perspective view of a computer support system;
FIG. 4 is a perspective view of a computer support system;
FIG. 5 is a perspective view of a portion of a computer support system;
FIG. 6 is a perspective view of a portion of a computer support system;
FIG. 7 is a perspective view of a portion of a computer support system;
FIG. 8 is a perspective view of a portion of a computer support system;
FIG. 9 is a perspective view of a portion of a top support of a computer support system;
FIG. 10 is a perspective view of a cup holder;
FIG. 11 is a perspective view of a computer support system;
FIG. 12 is a top view of a computer support system;
FIG. 13 is a top view of a portion of a computer support system;
FIG. 14 is a side view of a portion of a computer support system;
FIG. 15 is a top view of a top support;
FIG. 16 is a top view of a top support;
FIG. 17 is a perspective view of a mounting system for a computer support system;
FIG. 18 is a partial perspective view of a mounting system for a computer support system;
FIG. 18A is a perspective view of a U-shaped bracket for a computer support system;
FIG. 19 is a perspective view of a cup holder;
FIG. 19A is a perspective view of a spring-loaded pin for attaching a cup holder to a computer support system;
FIG. 20 is a top view of a top support;
FIG. 21 is a top view of a top support;
FIG. 22 is a top view of a computer support system;
FIG. 23 is a top view of a top support;
FIG. 24 is a perspective view of a top support;
FIG. 25 is a perspective view of a top support;
FIG. 26 is a perspective view of a top support;
FIG. 27 is a partial perspective view of a mounting system;
FIG. 28 is a top view a top support;
FIG. 29 is a partial top view of a top support;
FIG. 30 is a perspective view of a top support;
FIG. 31 is a top view of a computer support system;
FIG. 32 is a top view of a computer support system;
FIG. 33 is a top view of a top support;
FIG. 34 is a top view of a top support;
FIG. 35 is a top view of a top support;
FIG. 36 is a top view of a computer support system;
FIG. 37 is a partial perspective view of a computer support system;
FIG. 38 is a top view of a computer support system;
FIG. 39 is a top view of a computer support system;
FIG. 40 is a top view of a computer support system;
FIG. 41 is a top view of a computer support system;
FIG. 42 is a top view of a computer support system;
FIG. 43 is a top view of computer support system;
FIG. 44 is a partial view of a top support showing a pin within a curvilinear guide;
FIG. 45 is a top view of a top support in lap position;
FIG. 46 is a top view of a chair attached to a frame and a fixed armrest with the top support removed;
FIG. 47 is a top view of a computer support system having a secondary tracking system;
FIG. 48 is a side view of a computer support system having a secondary tracking system;
FIG. 49 is a perspective assembly view of a support platform and a chair wherein the support platform is attachable to the chair armrests;
FIG. 49A is a partial perspective view of an optional attachment point for use with a waterfall type of chair armrest;
FIG. 50 is a partial front view of the support platform and chair of FIG. 49;
FIG. 51 is a top plan view of the support platform and chair of FIG. 49;
FIG. 52 is similar to FIG. 51, but with the support platform reconfigured; and,
FIG. 53 is similar to FIGS. 51 and 52, wherein the support platform is configured in various positions.

DETAILED DESCRIPTION

The following descriptions of detailed embodiments are for exemplifying the principles and advantages of the inventions claimed herein. They are not to be taken in any way as limitations on the scope of the inventions.

The present invention is directed to a computer support/workstation and system with two specific use positions. The first use position includes a support frame and top support mounted to a chair. This portion of the invention allows the chair occupant a great range of body motion and movement while maintaining close contact with a computer keyboard, mouse pad, laptop or the like. The many advantages of having the above component travel with the chair user, at an arms length away, are numerous and obvious. The second use position described refers to a top support surface removed and separated from its chair mounted support frame. This portion of the invention is as useful, if not more, under certain circumstances.

The completely mobile top support surface can be easily carried across a room or an office over in the hands of the user, who then would set the support top on a number of surfaces, including the user’s lap. This portability feature allows the user of a laptop computer or keyboard to add great mobility and stability, versus attempting to balance the smaller sized foot print of these components on their knees or lap.

This portable system also provides an armrest with an area to operate a mouse and a writing surface with storage below. Once again, the support top holds the wireless keyboard, mouse, laptop computer or other component at arm’s length for the user, making its benefits obvious.

The combination of the two aspects of the present invention, as stated above and within this document, achieved from the one single system, makes this system extremely practical to manufacture and should be desirable to use and to own.

Accordingly, embodiments of the present invention are directed to a computer support system. The system allows a user seated in a chair to comfortably operate a standard computer keyboard, mouse pad or other electronic devices while adding great mobility and convenience, not available in traditional computer/keyboard setups. Once the system is adjusted to suit the individual user, the relationship between
the user and the system remains the same. The user is able to move freely about a floor area depending on the style of the chair and the space available, while maintaining constant access to the keyboard or such devices.

[0077] These embodiments include, but are not limited to, three possible applications. First, a chair would come factory equipped with system included. Secondly, the system could be designed for office retrofitting a standard office type chair. This would be accomplished by attaching a wide flat or slightly curved plate to the underside of the chair seat, which typically consists of plywood, plastic, metal, or the like. This flat plate is welded/attached on a 90 degree angle to a vertically telescopic member. Thirdly, the system could be designed to adapt to the standard telescopic armet that is commonly found on a number of office type chairs. This application could be achieved by removing the screws that secure the padded upper portion of the armet to the remaining portion. The new system would bolt on using existing holes. The armet’s original up and down adjustment would eliminate the need for a vertical telescopic member of the system which would be needed for other retrofit or factory installed systems.

[0078] Embodiments of the invention described within this document relates to the use of a computer keyboard, laptop, note pad, DVD player or other devices, more specifically the support surfaces on which these items rest.

[0079] An embodiment of the invention provides a solid support surface for computer devices and office supplies during lap use. In addition, the lap use support surface could be equipped to portably mount to the underside of a traditional desk. In essence, this embodiment is comprised of one single support surface which transitions portably between a desk mounted use position to a convenient and comfortable lap use component support surface.

[0080] In one embodiment, a computer support is attachable to an external body, such as a chair or desk. The computer support comprises a top support means which includes a first support joined to a second surface. A first pivoting means provides for at least partial rotational movement of the top support about a pivot point. An alignment means is provided for moving at least a portion of the computer support along a horizontal plane, and a frame means is provided for attaching the support means to the external body.

[0081] The alignment means may provide for drawing the computer support in a north to south direction relative to a user. Alternatively, or in addition to north to south movement, the alignment means may be provided for bringing the surface into substantial parallel alignment with the second surface (e.g., relative rotational movement aligns the two surfaces in parallel).

[0082] The pivoting means may be a hing or pin/guide (as in a track, slot, or channel) arrangement.

[0083] In the pin/guide arrangement, the pin joins the first surface to the second surface. The pin is located within the guide and is capable of rotating and traversing within the guide. The alignment means may include a second pin and a curvilinear guide wherein the second pin is located within curvilinear guide and traverses therein. This alignment means selectively brings the first surface and the second surface into substantially vertical alignment.

[0084] In another embodiment, a computer support provides a variable workspace for a user. The computer support comprises a first surface positioned along a first substantially horizontal plane; a second surface offset from and located on a separate horizontal plane than the first surface; and a pin joining the first surface and the second surface. The pin defines a pivot point upon which the first surface is pivotally mounted to the second surface for rotational movement about the pivot point along the first substantially horizontal plane. A guide is adapted for receiving a portion of the pin. At least one portion of the guide is in substantial alignment with the second surface, and the pin is adapted for traversing the at least one portion of the guide. This embodiment may also include a mounting system for attaching the computer support to a chair. The mounting system may include a first bracket attached to the second surface, and a second bracket having a first portion attached to the first bracket and a second portion for attachment to a chair. The mounting system may include a frame attachable to the first bracket. The frame provides structural support for the first and second surfaces. Accordingly, the frame includes a first member located beneath the first surface and a second member generally transverse to the first member and located beneath the second surface. This embodiment may further include a second pin and a curvilinear guide. The second pin joins first surface and said second surface. The curvilinear guide is adapted for receiving the second pin wherein the second pin traverses within the curvilinear guide.

[0085] Yet another embodiment of the present invention provides a computer support system for selective attachment to an external body, such as a desk or a chair. The computer support system comprises a top support comprising a first surface and a second surface. The first surface is located on a separate horizontal plane than the second surface. A first pin joins the first surface with the second surface. The first pin defines a first pivot point upon which relative rotational movement between the first surface and the second surface bring the first surface and the second surface into selective substantially parallel alignment. A second guide extends along a portion of the top support. The pin is also located within the second guide wherein traverse of the first pin within the second guide brings the first surface into selective substantially vertical alignment with the second surface. A second pin is located between the first surface and the second surface. A third guide has a curvilinear shape. The second pin is adapted to traverse along a length of the third guide. The first surface may be selectively rotated about the pivot point and traversed in a plurality of directions.

[0086] The various embodiments will become more clear with reference to the Figures as set forth below.

[0087] FIGS. 1-3 are illustrations of a computer support system or support system 10 ("the system") of the present invention. The system 10 is illustrated in use with, as in attached to, a chair 11. It is contemplated that the system 10 may be supplied with, as permanently attached to, or retrofitted, as in selectively attached to, an office chair 11 or the like. As will be described in more detail below, the system 10 can be separately removed from the chair 11 for use in other relaxing positions.

[0088] The system 10 is adapted for arranging a computer mouse, keyboard, laptops, or other personal electronic devices. The system includes a top support 14 comprising a pair of surfaces 16, 18 having hinges 20, 21 for clockwise or counterclockwise rotation about the hinges 20, 21. Accordingly, the surfaces 16, 18 may be lifted and a storage area 22, designed to accommodate recessed trays for pens, pencils, compact discs, etc. may be located under surfaces 16, 18. The top support 14 may also be pivoted about a hinge 21 to
facilitate entry or exit from the chair 11. The movement is indicated by an arrow on FIG. 2. The top surface 14 also includes an alignment means that allows north to south (or in, towards a user, and out, away from a user) movement of the top surface 14. This movement is indicated by an arrow on FIG. 1.

Additionally, surfaces 16, 18 may slide out to accept other size devices, laptops etc. An under support surface area could also accommodate a pull out drawer. This auxiliary support surface/drawer could also act as an area to rest one’s wrists while operating the keyboard. A slide out surface to accept mouse pad for left handed users may also be included.

The system may include an under seat mounted side saddlebag. This storage area could be used in conjunction with the system 10. It would make for convenient storage of the keyboard, laptop, schoolbooks, etc.

It should be understood that the top support 14 can be many shapes and sizes to accomplish its task, and the invention primarily lies in its workings than its appearance. Furthermore, it is also understood that the above mentioned top support 14 could also be used not only to support other devices, but as a convenient working and writing area, using traditional means for writing or the new electronic type computer pens.

The system 10 is capable of movement in many directions to accommodate comfort of the user, preferably one of the movements includes a north to south motion to move the top support 14 closer to or farther away from a user. FIG. 3 shows a side view of a third position with the top support 14 opened for access to the storage within. On some models this hinged storage feature may be excluded. Furthermore, other systems (models) may include storage in the second surface/armrest 18 only. This would allow on some models the support surface which holds the keyboard or devices to telescope or fold next to or into the armrest 18, mouse pad supporting area.

Referring to FIG. 3, several arrows illustrate various movements of the system 10. The system 20 may tilt or pivot about hinge 21, allowing for comfortable chair entering and exit. The mouse pad and keyboard could be secured to the first surface 16 using a number of commonly available attachment means, for example, Velcro, suction cup, adjustable clamps, sliding clamps, etc., or would rest against a raised edge on the first and second surfaces 16, 18. The top support 14 also moves in a north to south orientation for the comfort of the user.

FIG. 4 is a perspective view of the system 10 showing various directional movements illustrated with arrows. A first telescopic subsystem 26 allows up and down vertical movement. The telescopic subsystem 26 may include rectangular members lengthwise with the armrest 18 to achieve more strength to the keyboard or the like. A receiving member (outer) 26a may also include a reverse spring to aid in the raising up of the system 10. Furthermore, this vertical telescopic member 26a may also consist of a pneumatic lift similar to the type found on adjustable swivel chairs.

A second telescopic subsystem 28 allows the system 10 to forward and backward in a substantially horizontal motion along a horizontal plane away and towards a user seated in the chair. This subsystem 28 allows for north and south adjustment in relationship to a seated user.

As illustrated in FIG. 4, the top surface 14 is supported by transverse support members 30, 32 which are pivotally mounted. A mounting 33 for attachment to a chair is attached to the first telescopic subsystem 26.

Options for mounting the surface 18 are illustrated in FIGS. 5-8. FIG. 5 is an illustration of a third telescopic subsystem 29 for lateral movement of the system 10, as in right-to-left/left-to-right movement. FIG. 6 illustrates a pivoting system about pivot joint 34. FIGS. 7 and 7a illustrate a swing arm support system 36. Also, this embodiment includes a bendable swing arm system 38 with a disk suction cup 40 as a means to attach keyboard or other devices. The suction cup 40 would be similar to the type used in the window glass and/or car dent puller industry. This swing arm/suction cup would fold and store into the offset (raised) armrest. Detail of a typical swing arm connection is illustrated in FIG. 7a. FIG. 8 illustrates a variation of a swing arm 42 and suction cup 40 or other attachable means disk.

FIG. 9 shows a first surface 16 and a portion of a second surface 18. This arrangement may include a hinged offset 44 which allows mouse pad surface to be higher in relationship to the keyboard. This offset 44 also forms curb to hold keyboard during tilt position. The offset or raised edge 44 allows the mouse, and keyboard to remain on the surface 16 as it is tilted. The position of this hinge 44 allows the keyboard surface 16 to tilt up for chair entry, while the mouse pad/armrest remains in its standard first use position.

An optional hinged cup holder 48 is illustrated in FIG. 10. The cup holder 48 can be attached to one of the transverse support member 30, 32, wherein the cup holder 48 pivots about a hinge 50. The hinge 50 allows the cup holder 48 to remain in the proper position as the member 30, 32 to which it is attached is pivoted.

FIG. 11 is an alternate embodiment of the system 10 for retrofit or factory installed applications. This system includes a mouse pad armrest area. A vertical adjustment 62 for the elbow rest portion of the armrest 18 allows the user to raise and lower the system 10. A second supporting surface 16 for supporting a keyboard has a tiltable adjustment 65. Telescopic adjustment 66 allows the user to position the keyboard comfortably. An under seat attachment method 70 for this particular model consisting of semi-circle flap strapping looped over structural members and secured by common means to an underside of the chair 11. If not all, a number of the parts of this invention would be built for universal application, allowing for left or right side of chair attachment.

This invention’s parts would be made of materials commonly used for the above mentioned applications. Including but not limited to various forms or metals, plastics, fiberglass, and wood.

FIG. 12 shows an overhead view of a system 10 of the present invention mounted to a chair 11. This system 10 includes top support 74 including keyboard surface 76 and armrest 78. A diagonal hinge 80 allows for a storage area beneath armrest 78.

FIG. 13 shows a top support 74 resting on a support frame 82, generally L-shaped. The heavier dotted line, outlines an open recessed, channeled area 84. The supporting frame 82 slides in, left and right, of the seated chair user, to align the keyboard as desired. A friction fit U-shaped engaging bracket 86 holds the hinged armrest top closed. This is shown in more detail in FIG. 14. To remove the complete top support 74 from the support frame 82, the user disengages the U-shaped bracket 86 by lifting the corner of the top, opposite the hinged side, and then sliding the entire top 74 all the way to the left.
Frame 82 includes end 88. End 88 fits within retainer 90 which is located on the underside of top support 74. The end 88 is typically a four-sided structure. The end 88 slides out of the 4-sided retaining area 90 when the top support 74 is slid to the left to remove top 74 completely from this support frame 82.

FIG. 15 shows an overhead view of a top surface 74. The top surface 74 includes a recessed beverage holder 94. An outline of a keyboard is denoted by dashed line 96. A recessed storage area 98 is located below beneath surface 76. Likewise, a recessed computer mouse or other storage area 100 is on the upper hinged armrest 78. A mouse pad 102 is designated by dotted lines. The top surface 74 also includes adjustable outside corner stops 104 to hold a standard keyboard.

Referring to FIG. 16, the armrest surface 78 is shown hinged open. An adjustable slide stop 105 is provided to secure a laptop computer 96 or other device. The laptop 96 is shown in dotted lines. The underside 106 of the hinged armrest 78 is visible when the armrest 78 is open. A storage area 108 is located beneath the armrest 78.

FIG. 17 shows frame 82 as part of a chair mounting system 110. The mounting support 110 includes telescope member 112 which is raised on top support 74 rests. The telescope member 112 allows in and out movement of the top support 74 so the user can adjust the armrest system to the proper level. Once again, there are many options of how it can be accomplished for the up and down movement.

The receiver 113 includes a hinge 114. This hinge allows the top support 74 to be pivoted upwardly and clockwisely (designated by 116) about the hinges 114 so the user may enter and exit the chair.

The receiver 113 is fit within an outer receiving member 118 for vertical (up and down) telescopic movement. A spring stop knob 120 or other similar means maintains the receiver 113 at the proper chosen level. Once again, there are many options to accomplish the up and down movement. (spring assisted, pneumatic leveling, etc.).

The mounting support 110 includes a first bracket or plate 122 for mounting to a chair with bolts, rivets, screws, epoxy, welding, or the like. The first bracket 122 includes a receiver channel 124 a bracket portion 125 of the receiver member 113. The receiver 113 is attached to the channel 124 using conventional attachment means. In the embodiment illustrated, six or so short, heavy self-tapping screws 126 are provided to attach the first bracket 122 to a chair. Four or more machine bolts 128 are slid up through bracket 122 through springs 130 to threaded nuts 132.

Now referring to FIG. 18, an alternative method for attaching the keyboard or like, via a hinged channel 134. A mating channel member 136 is adhesively attached to the underside of the keyboard and slid or snapped into place.

U-shaped bracket 138 is attached top the underside of the top support 74, and mates with telescopic support frame member 112.

The above stated mounting bracket system 110 accomplishes two important mounting issues. First, the through bolted adjustable bracket allows the system to be mounted to varied styles of seat designs. Typically, task style chair seats curve up on the sides to form a dished surface. The travel between bracket 122 and receiver 113 (90 degree angle bracket) allows the frame 82 to be mounted under a chair seat, whether it be flat or curved upwards and at any degree. Second, the spring-loaded bolts absorb to a certain extent most accidental downward or upward undo pressure applied to the cantilevered top.

Now referring to FIG. 19, a cup holder 140 is illustrated. The cup holder 140 includes a spring stop mechanism 142 for attachment to the frame 82. The cup holder further includes an over the top, snap on bracket 144, which attaches to the frame 82. When the frame 82 is tilted as per arrow 146, the beverage remains in upright position. This is accomplished by a pivotal bracket connection. The cup holder 140 also includes a bump into notch system 150 to hold the bracket 144 from sliding from side to side. The bumps 152 are illustrated best in FIG. 19a.

FIG. 20 is an illustration of the top support 74 removed from the chair. This figure represents a different use position for the system 10 which allows the user to utilize the top support 74 in a location other than the chair. Here, the telescopic member 112 is removed completely from the receiving member 113. The L-shaped frame 82 is then flipped oversided and inserted into a tight friction fit area. The hinged armrest 78 is then closed so as to engage bracket 138, which is also a friction fit bracket. A slip-on foam pad 156 may be provided to rest on the user’s lap when using the system 10 after it has been removed from the chair. (See also FIG. 21). The top support 74 may include recesses areas 158 on an underside for a resting support surface on the user’s knees.

FIG. 21 shows an overhead view of the system 10 in use, resting on a user’s lap after its been removed from the chair.

FIG. 22 shows a top support 74. In this embodiment, the mounting system 110 has a shortened horizontal support frame 162. Here, the frame 82 remains attached to the chair when the top support 74 is removed from the chair. This shorter frame 162 allows for easier access and exiting from the chair seat. Further to this embodiment, the mounting system 110 includes a receiver 164 for receiving a telescopic member 166 located on the mounting system 110 for fixing the overall system 10 to a chair. A slide stop mechanism 169 guards against misaligning the top support 72 with the mounting system 110. This embodiment also includes a shorter thigh rest bar. In operation, this version slides in and out along the receiving member 164. This also can serve as a carrying handle when in the second use position.

The embodiment of FIG. 23 is similar to that of FIG. 22. However, this embodiment includes a pivoting support frame member 172 which pivots and slides to become a thigh rest. Another version has a mirrored image structural support piece to match and rest with support frame and fold open (butterfly) to become a thigh rest. Another version has the complete frame piece (L-shape) being one and sliding in and out.

FIG. 24 illustrates a top surface 74 having a built-in flip up monitor screen 178 for computer or DVD use. The advantage to having a smaller screen offset and to the side of the keyboard is that its presence is unobtrusive.

FIG. 25 illustrates yet another embodiment of the present invention. This embodiment includes a hinge 180 between a first surface 76 and an armrest 78. The hinge 180 can be locked for lap use. This embodiment includes raised curb/stops 186 to hold a keyboard in place. Also, the bumpers may include spring-loaded squeeze members on one or both sides 181. This function can also be accomplished by other commonly known means such as stop knobs or other etc.
armrest 78 includes a mouse holder 188, a beverage holder 190, and a plurality of pen, pencil (electronic) or other storage receptacles 192. The first surface 76 includes a shallow storage area 194. A stabilizer 196 may pivot outwardly from the armrest 78 for resting upon the users thigh for lap use.  

[0120] The embodiment of FIG. 26 is similar to the embodiment of FIG. 25. Here, the first surface 76 includes a graduated curb stop 198 to accommodate various sized devices on which to rest or against which to abut. The armrest 78 includes a curved cut out top 200 to expose a beverage holder 202 below. The armrest 78 further includes a hinged mouse pad storage area 204.  

[0121] FIG. 27 is an illustration of a mounting system 110 for the system. The mounting system 110 has clamping locations in at least two points to squeeze a chair seat 210 for attaching the mounting system 110 to the chair 11. The squeezing application would be achieved by commonly known means including, but not limited to, clamps, wing nut and bolts, or caulk gun type mechanism, etc.  

[0122] The mounting system 110 includes an upper bracket 207 having a first stabilizing flange 212 which rests on the upper seat portion of the chair 11. A second stabilizing flange 214 extends downwardly from the first flange 212 to form an L-shape. The second flange 214 is located along an edge of the chair 210. A separate lower bracket 216 is fixed to the bottom of the chair 217. The lower bracket 216 includes an upwardly extending flange 218 which is joined to the second stabilizing flange to connect the upper bracket 207 to the lower bracket 216. The upper and lower brackets may be attached using any fastening option, nut and bolt or the like and would in at least two locations, attaching L-shaped top seat bracket to the L-shaped under bracket. A plurality of vertical support frame members 220 extend upwardly for added stability.  

[0123] FIG. 28 illustrates yet another embodiment of the present invention. This embodiment includes a top support 74 including a first longitudinal surface 76 adapted for extending along the front of a chair. An armrest 78 extends along one side of the chair 11 to form a generally L-shaped structure in use. Arrows indicate the movement of the top support 74.  

[0124] FIGS. 29-30 illustrate movement of the first surface 76. The first surface 76 pivots and slides for chair seat entering and exiting. The first surface 76 pivots about a pivot point 238 until it is substantially in line with (parallel) and above the armrest 78. A pin 239 joins the first surface 76 with the armrest 88 and traverses within a guide 242 for alignment. The first surface 76 can be traversed toward the rear of the chair 11 substantially over the armrest 78. In other words, the first surface 76 pivots away from the user, and then or simultaneously slides back toward the rear of the chair occupants to overlay in substantially vertical alignment with at least a portion of the mouse pad/armrest area 78. This embodiment can be attached to a chair or a desk using any conventional means for attachment, including but not limited to a retractable arm, a type of which is commonly provided with permanently mounted under-desk keyboard supports.  

[0125] Similar to other embodiments, this system includes a mouse pad area 240, and any number of cup holders, storage recesses, pen holders, etc. Accordingly, the first surface 76 and the armrest 78 include hinges for lifting upper members under which the storage recess etc. may be located. This embodiment may be equipped to portably mount to the underside of a traditional desk, similar to a conventional pull-out keyboard drawer or retractable arm mount-style. The first surface 76 could include features not found on a typical under-mount style keyboard tray. In essence, this embodiment is comprised of one single support surface which can transition portably between a desk mounted use position to a convenient and comfortable lap use.  

[0126] FIGS. 31 and 32 illustrate how the system 10 first surface 76 may pivot and overlay the armrest 78. The top support 74 includes a tracking (guide) member 242, such as a channel, slot, or track. The tracking member 242 is mounted along an inside edge of the armrest 78. The tracking member 242 may be a channel wherein a downwardly extending pin 244 is mounted to the underside of the first surface 76 may traverse within the channel 242. The pin 244 may also travel with a guide or slot 245 located within the first surface 76 for left to right and/or north to south movement as an alignment means. Accordingly, the guide 245 may be L-shaped as illustrated in FIG. 32.  

[0127] The first surface 76 of this embodiment and the embodiments that follow is joined to the second surface at least by pin 244 offset on a separate substantially horizontal plane than the second surface 78, preferably on a higher plane. This method allows the first surface 76 to slide and overlay the second surface 78; i.e. pivot or rotate along a horizontal plane, preferably the horizontal plane on which the first surface 76 is positioned. The sliding and overlapping application requires no significant fastening demands as these components merely rest upon the system’s top support 74.  

[0128] FIGS. 33 and 34 show the top support 74 removed from the chair or desk mounted framework in its portable or lap rest use position. FIG. 33 shows the mouse pad 250 and armrest 78 rotated approximately 90 degrees on the pivot 238, revealing an auxiliary area of mouse pad 250 where the right side of the armrest 78 (when chair mounted) rotates to become a thight rest for lap use. FIG. 34 shows the combination mouse pad and thigh rest tracking north and south to adjust location in reference to the keyboard support surface to best suit the user.  

[0129] The embodiment of FIGS. 35-36 is similar to the embodiments of FIGS. 31-34. The most significant variation is that this embodiment has the first surface 76 and the mouse pad surface 250 as one on the same horizontal plane and traveling together. The advantage of having the first surface 76 as one is that when the first surface 76 is tracked to the side of the chair 11 and is overlaying the armrest 78, the mouse and mouse pad 250 are still accessible.  

[0130] In FIG. 36 the system 10 first surface 76 is adjusted east and west or left and right of the seated chair user. This is accomplished as first surface 76 includes an L-shaped slot/channel 245, which acts as a further alignment means. Armrest 78 includes slot/channel 242 transverse to slot 245. Pin 244 is snug fit within the guides 245, 242 for reliable traversing through same. This allows for east to west (or right to left) movement along a substantially horizontal plane within or along guide 245 and north to south (or in and out) movement along a substantially horizontal plane within or along guide 242.  

[0131] FIG. 37 illustrates a variation of a telescopic member as previously described. A portion of the armrest 78a remains permanently attached to a chair mounted support framework 110. Another portion of the armrest 78b is removable from the framework 110 along with the first surface 76, and abuts the fixed portion of the armrest 78a when the attached to the framework 110. Arrow 274 shows slideable north and south adjustment along a substantially horizontal
plane in relationship to a seated chair user. Arrow 276 shows the slideable travel for pin 244 in track/slot 245. Member 282 is permanently attached to the support framework 110. Member 282 generally includes a flange 282a extending horizontally outward relative to a seated user and a smaller flange 282b extending in an opposite direction, horizontally inward relative to a seated user. Member 282 is adapted to friction fit within groove or channel 283 located on the underside of armrest 78a. Accordingly, guide 283 includes a larger lip 283a for engaging larger flange 282a, and smaller lip 283b for engaging smaller flange 282b. By lifting top support 74 as arrow 286 and sliding slightly, the top support 74 is detached from chair mounted framework 110 and is ready for portable use.

Referring to FIGS. 38-45, the embodiment as previously described further includes additional pin 330 that traverses through curvilinear guide 332 providing still further alignment means. This contact point enhances the strength of the cantilevered keyboard first surface 76 and provides an additional pivot point. The curvilinear shape of guide 332 also allows the top surface 74 to traverse in a north to south (in and out) component along a transverse substantially linear portion of the guide 332 and/or in a motion that has both north to south (towards and away relative to a seated user) and east to west (left to right relative to a seated user) components as pin 330 traverses along an arcuate portion of guide 332.

FIG. 39 shows the first surface 76 rotated away from the user. This is accomplished by the top pivoting on pin 244, and pin 330 traveling inside or along edge of guide 332.

FIG. 40 shows the pivot pin 244 traveling in track 242 (as previously submitted) to further adjust keyboard support overlaying mechanism. This motion may be carried out simultaneously, as first surface 76 is pivoted outwardly.

This motion reveals the cantilever pin 330 tracking location. This area of invention aids secondary support. Pin 330 disengages as the first surface moves to overlay the armrest 78. Tracking may also run along the outside edge of the underlying support structure, as well as a number of other commonly known methods of accomplishing this needed structural element.

Note the rotation of the two adjoining support surfaces to ready the top support 74 for its lap use position. Pin 244 now travels along guides 242 and 245, and Pin 330 now travel along guide 332, as can be clearly seen in FIGS. 39 and 43. The combination of the multiple movements in two tracking locations allows for numerous adjustments in a plurality of directions. The pin 244, 330 may be spring loaded to absorb downward pressure applied to cantilevered top.

Specifically referring to FIG. 41, the top surface 74 is shown “nested” with the first surface 74 in substantial parallel and vertical alignment with the armrest 74b. This position is also used for transport and/or storage of the top support 74 when the top support 74 is removed from the chair.

FIG. 45 shows the system in lap use.

FIG. 46 shows the a chair 11 with the frame 110 and fixed armrest 78a with the top support 74 removed.

FIGS. 47 and 48 illustrate a variation of the previous embodiment. Here, the alignment means the chair mounted top support 74 to traverse further south or inwardly relative to the user. This additional movement would allow a chair 11 with a mounted top support 74 to fit under a desk without the top support 74 acting as an impediment. Referring to FIG. 49, this embodiment includes a secondary tracking system 350. This secondary tracking system 350 uses a mechanism similar to a drawer slide tracking mechanism. This secondary tracking system 350 includes a third tracking member which allows further telescopic movement to move the top support 74 farther away from the desk. Further, the secondary tracking system may include drawer slides employing the third tracking member, guides, and rollers that guide and support the top support 74 permitting easy operation.

In an alternative embodiment, it is desired to provide a means for a computer keyboard and mouse, laptop, MICROSOFT SURFACE, or the like to attach and travel along with a chair directly in front of the user and at a comfortable arm length, no matter which way the chair is tilted or turned.

Turning to FIG. 49, a perspective assembly view is provided of a support platform 4903 and a chair 4940 wherein the support platform is attachable to the armrests 4910 of the chair. The armrests 4910 of the chair 4940 can have, but are not limited to, a conventional height adjustable T-shaped armrest style. The support platform 4903 can be attachable to the armrests 4910 by conventional means such as, but not limited to, straps 4902 with hook and loop fasteners such as VELCRO.

The support platform or member 4903 can have a generally horseshoe shape or U-shape with a pair of arm segments 4942 and 4943 spaced apart from each other. The arm segments can include concave portions 4992 for receiving a portion of the chair armrests 4910 as depicted in FIG. 50.

In an embodiment depicted in FIG. 49, at least a portion of the support platform can be tubular for receiving another tube of smaller circumference 4904. Thus, the distance between the support segments 4942 and 4943 can be increased or decreased to adjust to the width of the chair 4940. Stated another way, the platform 4903 includes a chair width adjustment means that allows the platform to mate with a variety of chair sizes.

Telescopic angle support brackets 4905 can also be provided to add stability to the platform 4903. Accordingly, the ends of the support brackets 4905 are attached to the chair frame, and in particular the base of the chair armrest, and also to the support platform 4903. The support brackets 4905 can be attached at point 4907 to the support platform 4903 via a pivot such as, for example, a conventional ball and socket joint. Moreover, the support brackets 4905 can be attached to the chair frame by conventional thumbscrew clamps 4906, set-screws, hook and loop fasteners, or the like. The support brackets 4905 can consist of a conventional tie rod, turn-buckle or other convention locking telescopic means.

In an alternative embodiment, depicted in FIG. 49A, the support brackets 4905 can be attached about the distal end of the arm segments of the support platform 4903. This embodiment can be used with a chair having a waterfall type of armrest wherein the armrests are curvilinear metal tubes, for example, and the armrests can also be attached to the chair backrest. Moreover, a semicircle cutout 4927 can be provided in the arms 4943 and 4942 of the support platform 4903 for allowing the platform to securely attach to the armrest.

Turning back to FIG. 49, a keyboard support surface 4911 can be detached from the platform 4903. As shown in FIG. 50, structure members 4914 and 4915 of the keyboard support 4911 can be attached or coupled together by a metal or metal alloy pin 4916 that is generally l-shaped in cross section. Desirably, reciprocating forward and backward movement of the pin 4916, and thus surface 4911, can be
provided by a track 4983 (FIG. 53) in member 4914, and lateral movement of the pin, and thus surface 4911, can be provided by another track 4984 (FIG. 53) in member 4915. Accordingly, the support surface 4911 is allowed to move in the direction of arrows 4917 and 4918 depicted in FIG. 51. As shown in FIG. 53, both of the channels or tracks 4983 and 4984 are generally C-shaped in cross section.

[0148] As previously indicated above, the support surface 4911 can be detached from the platform 4903. As shown in FIG. 50, the detachable feature can be provided by a parallel pair of rails 4919 extending from structure member 4914 wherein the rails slide within a parallel pair of channels or tracks 4920 formed within support platform arm member 4943. Each of the rails 4919 can be different in cross section such as, but not limited to, one rail being L-shaped and another rail being rectangular.

[0149] Preferably, the cantilevered support surface 4911 can be removed from the platform 4903 by moving the support structure upward in the direction of arrow 4924, and then laterally in the direction of arrow 4962. Accordingly, the rails 4919 become disengaged from the channels 4920. Likewise, the rails 4919 can be engaged in the channels 4920 by moving the support surface 4911 opposite of arrow 4962 and downward in the direction of arrow 4924.

[0150] As shown in FIGS. 50 and 51, an optional telescopic member or extension 4921 can be attached to the keyboard support surface 4911. The telescopic member 4921 aids in extending the support surface area to better accommodate and secure the footprint of some laptop computers. The telescopic member 4921 can include a pair of metal or metal alloy tubular members that are received within cylindrical bores in structure member 4915.

[0151] Turning to FIG. 51, an optional sliding support member 4922 can be coupled to arm 4942 of the support platform 4903 and to the structure member 4915. In an embodiment, the support member 4922 can be slid as per arrows 4923 and assists in supporting the downward load of the keyboard support surface 4911.

[0152] Turning to FIG. 52, a top view is provided that depicts the keyboard support surface 4911 overlaying a portion of the support platform 4903 and chair armrest after traveling in the tracks 4919 (FIG. 50) and channels 4920 (FIG. 50) whereas the pin 4916 (FIG. 50) reciprocally and laterally moves in channels 4983 and 4984 (FIG. 53), respectively. As will be appreciated by those having ordinary skill in the art, the reciprocal and lateral movement of the support surface can be carried out simultaneously.

[0153] By the above embodiment depicted in FIGS. 49-53, a chair mounted structure is provided that attaches without having to bolt or unbolt any of the preexisting chair parts and enables these items to mount to and travel along with it. More specifically, the embodiment teaches a way to attach the keyboard support surface to a variety of office chairs using their existing armrests. This is achieved by overlying both armrests which enhances their strength and integrity by adjoining them with a structural member or platform which horseshoes being around the chair back.

[0154] The two distinct styles of armrests common to a traditional desk chair is the adjustable L-shaped type and the fixed waterfall shaped. The horseshoe shaped structural member or platform is designed to accommodate the various shapes and sizes of both styles. The overlaying platform is designed to fit on top and over both armrests. Taking advantage of their structural integrity and somewhat counter balancing the cantilevered keyboard support surface or tray.

[0155] Several alternative embodiments have been described and illustrated. A person skilled in the art would appreciate that the features of the individual embodiments, can be applied to any of the embodiments. Further, the terms “first,” “second,” “upper,” “lower,” etc. are used for illustrative purposes only and are not intended to limit the embodiments in any way. The term “plurality” as used herein is intended to indicate any number greater than one, either disjunctively or conjunctively as necessary, up to an infinite number. The terms “attached,” “joined,” and “connected” as used herein are intended to put or bring two elements together so as to form a unit, and any number of elements, devices, fasteners, etc. may be provided between the joined or connected elements unless otherwise specified by the use of the term “directly” and/or supported by the drawings. The term “substantially” is often in conjunction with another term to describe a particular characteristic of the present invention. It is a broad term. As used herein, the term “substantially” is intended to mean “largely that which is specified,” and small variations that do not have an appreciable effect on the utility and function of the present invention do not escape scope of that which is specified. One of ordinary skill in the art would understand what was meant by “substantially.”

[0156] It should be emphasized that the above-described embodiments of the present invention, particularly, any “preferred” embodiments, are possible examples of implementations merely set forth for a clear understanding of the principles for the invention. Many other variations and modifications may be made to the above-described embodiment(s) of the invention without substantially departing from the spirit and principles of the invention. Accordingly, all such modifications are intended to be included herein within the scope of this disclosure and the present invention, and protected by the following claims.

What is claimed is:

1. A support system attachable to a chair comprising:
   a. a support platform having a pair of arm segments;
   b. a keyboard support member coupled to one of the arm segments; and,
   c. wherein lateral and reciprocal movement of the keyboard support member is permitted relative to the support platform.

2. The support system of claim 1 wherein the support platform is generally U-shaped.

3. The support system of claim 1 wherein a distance between the arm segments can be increased or decreased to adjust to a width of the chair.

4. The support system of claim 1 wherein straps are attached to the arm segments and the chair.

5. The support system of claim 1 wherein support brackets are attached to the support platform and the chair.

6. The support system of claim 1 wherein an extension is coupled to the keyboard support member.

7. The support system of claim 1 wherein the support platform includes a concave portion for receiving a portion of an armrest extending from the chair.

8. The support system of claim 1 wherein the one arm segment includes a pair of parallel channels.

9. The support system of claim 8 wherein the keyboard support member includes a structure member having a pair of parallel rails extending within the channels.
10. The support system of claim 9 wherein the structure member includes a channel that is generally C-shaped in cross section.

11. The support system of claim 10 wherein the keyboard support member includes a channel that is generally C-shaped in cross section.

12. The support system of claim 11 wherein a pin that is generally I-shaped in cross section extends into the channels of the structure member and the keyboard support member.

13. The support member of claim 1 wherein a support member is coupled to the other arm segment and the keyboard support member.

14. A support system attachable to a chair comprising: a support platform having a pair of arm segments; a keyboard support member coupled to one of the arm segments having a pair of parallel channels, the keyboard support member having a structure member with a pair of parallel rails extending within the channels; and wherein lateral and reciprocal movement of the keyboard support member is permitted relative to the support platform.

15. The support system of claim 14 wherein the structure member includes a channel that is generally C-shaped in cross section.

16. The support system of claim 15 wherein the keyboard support member includes a channel that is generally C-shaped in cross section.

17. The support system of claim 16 wherein a pin that is generally I-shaped in cross section extends into the channels of the structure member and the keyboard support member.

18. The support system of claim 17 wherein a distance between the arm segments can be increased or decreased to adjust to a width of the chair.

19. The support system of claim 1 wherein an extension is coupled to the keyboard support member.

20. The support system of claim 1 wherein the support platform includes a concave portion for receiving a portion of an armrest extending from the chair.

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