

Title: IMPROVEMENTS IN DESKING SYSTEMS

This invention relates to desking systems and is particularly concerned with a modular desking system which can be configured in a number of different ways to meet the demands of individual customers.

- 5 According to the invention, there is provided a desking system which comprises a plurality of substantially vertical elongate members and at least one substantially horizontal work surface wherein means are provided for adjusting the depth of the desk and/or the length of the desk.

- 10 Preferably, four substantially vertical elongate members are provided which are adapted to be connected at or adjacent to each end of a desk of the desking system by the depth adjustment means which comprise a first member secured to one of the elongate members and a second member secured to the other elongate member at or adjacent to the same end of the desk, the two members of the adjustment means being adapted to be releasably connected together in a variety of different
15 locations according to a desired spacing between the substantially vertical elongate members in order to achieve a desired depth of the desk.

The members of the adjustment means preferably take the form of plates which may be detachably secured to the respective elongate members or they may be permanently secured to the members, for example by welding.

- 20 According to a preferred embodiment of the invention, the substantially vertical elongate members take the form of tubular legs of substantially circular cross-section. The legs at or adjacent to one end of the desk are desirably connected to the legs at or adjacent to the other end of the desk by rails which may be of any suitable length in order to obtain a desk having a desired length. The rails
25 preferably comprise extruded sections of a suitable metal such as steel or aluminium.

The rails are desirably adapted to receive support members for a work surface of the desk. The support members may be secured to the rail extending between the front legs or to the rail extending between the rear legs of the desk in order to vary the depth of the desk.

- 5 The legs of one desk may also serve as the legs of a second desk which is attached to the first-mentioned desk. It is also possible to use only one leg of a first desk as one of the legs of a second desk whereby the two desks are connected together by a single leg. By utilising legs of circular cross-section, the two desks may extend from the single leg away from each other at any desired
10 angle to one another.

As an alternative or in addition, the legs of the desk need not be located at the corners of a rectangle but could be located at the corners of a trapezium. A triangular configuration is also possible as is an arrangement in which the corners of a desk at one end consist of right angles while the other end is inclined at an
15 angle to said one end.

At least one of the substantially vertical elongate members or legs may be provided at its upper end with a spigot adapted to receive an extension pole for a support bracket, shelf and/or lamp.

- Alternatively, the substantially vertical elongate members or legs at the rear of the
20 desk may be adapted to receive a rail which is provided with means for engaging a like rail in such a manner that a wall of rails can be erected at the rear of the desk.

The invention will now be further described, by way of example, with reference to the drawings, in which:-

Fig. 1 is a perspective view of one embodiment of a frame for a desk according to the invention;

Fig. 2 is plan view of one embodiment of a connector for use in the desk shown in Fig. 1;

5 Fig. 3 is a view taken on the line III-III in Fig. 2 in the direction of the arrows;

Fig. 4 is a side elevation of the connector shown in Figs. 2 and 3;

Fig. 5 is a front elevation of the connector shown in Fig. 4;

Fig. 6 is a plan view of another embodiment of connector for use in the desk shown in Fig. 1;

10 Fig. 7 is a view taken on the line VII-VII in Fig. 6 in the direction of the arrows;

Fig. 8 is a side elevation of the connector shown in Figs. 6 and 7;

Fig. 9 is a front elevation of the connector shown in Fig. 8;

Fig. 10 shows the connection of the connector shown in Figs. 6-9 to a leg of the desk;

15 Fig. 11 shows the connection of the connector shown in Figs. 2-5 to a leg of the desk and the fitting of a front rail thereto;

Fig. 12 is a side elevation of a work surface support bracket adapted to be fitted to the rail shown in Fig. 11;

Fig. 13 shows the connection of the connector shown in Figs. 2-5 to a leg of a desk and the fitting of a rear rail thereto;

Fig. 14 is a side elevation of a connector for an adjustable foot for use with the desk shown in Fig. 1;

5 Fig. 15 is a section taken on the line XV-XV in Fig. 14 in the direction of the arrows;

Fig. 16 is a side elevation of a spigot adapted to fit into the top of a leg of the desk shown in Fig. 1;

10 Fig. 17 is a section taken on the line XVII-XVII in Fig. 16 in the direction of the arrows;

Fig. 18 is a side elevation of one embodiment of an assembled desk according to the invention;

Fig. 19 is a side elevation of a modified form of desk according to the invention;

Fig. 20 is a side elevation of another form of desk according to the invention;

15 Fig. 21 is a side elevation of yet another form of desk according to the invention;

Fig. 22 is a side elevation of still another form of desk according to the invention;

Figs. 23 and 24 are side elevations of a modified form of the desk shown in Fig. 22;

Fig. 25 is a side elevation of another form of desk according to the invention;

Fig. 26 is a front elevation of the desk shown in Fig. 25;

Fig. 27 is a side elevation of an alternative form of the desk shown in Figs. 25 and 26;

5 Figs. 28 to 30 are front elevations of modified forms of the desk shown in Figs. 25 and 26;

Fig. 31 is a side elevation of a narrow form of desk according to the invention;

Fig. 32 is a side elevation of another configuration of desk according to the invention;

Fig. 33 is a side elevation of two facing desks according to the invention;

10 Fig. 34 is a plan view of a desk assembly according to the invention; and

Fig. 35 is a plan view of another form of desk assembly according to the invention.

In the drawings, like parts are denoted by like reference numerals.

Referring to the drawings, a frame for a desk of a desking system according to
15 the invention comprises four tubular members of circular cross-section which constitute the legs 1, 2, 3, 4 of the desk. The legs 1 and 3 are designed to be located at the front of the desk and the legs 2 and 4 are designed to be located at the rear of the desk. Secured to each of the front legs 1, 3 intermediate the ends thereof is a respective first adjustment member 5 and secured to each of the rear
20 legs 2, 4 intermediate the ends thereof is a respective second adjustment member 6. Each adjustment member 5 is adapted to fit into the associated adjustment member 6 and to be slidable therein. The adjustment members 5 are provided at

the top and at the bottom with a series of closely spaced holes 7 and the adjustment members 6 are also provided with holes 8, but in this case not so many, which can be aligned with the holes 7. In order to achieve a desk of a desired width, the adjustment members 5 are slid into the associated adjustment members 6 until the legs 1, 2 or 3, 4 are located a desired distance apart. Screws or bolts or rods 9 are then passed through one of the holes 8 in the adjustment members 6 which are aligned with the holes 7 in the adjustment members 5 and may be secured by nuts (not shown) to secure the adjustment members and hence the legs 1, 2 or 3, 4 together at a desired spacing. Apertures 10 may be provided in the sides of both adjustment members for the fitting of accessories and/or cable clips (not shown).

The legs 1 and 3 are interconnected by an upper front rail 11 and a lower front rail 13 and the legs 2 and 4 are interconnected by an upper rear rail 12 and a lower rear rail 14. Each upper rail is connected to the associated legs by upper connectors 15 and each lower rail is connected to the associated legs by lower connectors 20. As shown in Figs. 2 to 5, each upper connector consists of a connector half 15 and a U-clamp 16 which is designed to mate with the connector half 15 around a leg of the desk. Each of the connector halves is provided with a pair of bores 15a which are arranged to be aligned with like bores in a co-operating U-clamp 16 whereby the connector halves and U-clamps can be connected together by means of screws or bolts (not shown). Each connector half 15 is further provided with a projection 17 which is adapted to be received in an aperture of a desk leg 1, 2, 3, 4 which serves to locate the connector half in a positive manner on the appropriate leg and to prevent said connector from movement on the leg. Each connector half also has a pair of flanges 18 at its lower end which project laterally from the main body of the connector and, at its upper end, a pair of upstanding beads or ridges 19. The U-clamp 16 may also be provided with a projection 17 for engagement in one of the apertures in the desk legs 1-4.

As shown in Figs. 6 to 9, each lower connector also consists of a connector half 20 and a U-clamp 16 which is adapted to mate with the connector half 20 around a leg of the desk. Each of the connector halves 20 is provided with bores 20a which are arranged to be aligned with the bores in the U-clamp 16 whereby the
5 connector halves and U-clamps can be connected together by means of screws or bolts (not shown). Each connector half 20 is further provided with a projection 20b which is adapted to be received in an aperture of a desk leg 1, 2, 3 or 4 which serves to locate the connector half 20 positively on the appropriate leg and to prevent movement of the connector on the leg. Each connector half 20 further
10 has a pair of flanges 21 at its upper end which project laterally from the main body of the connector. A further pair of smaller flanges 22 are provided at the lower end of each connector half 20 but these flanges do not project laterally to the same extent as the upper flanges 21.

As shown in Fig. 10, the lower rail 13 comprises a section of extruded metal such
15 as aluminium which is provided with a pair of recesses 23 and 24 for engagement respectively with the flanges 21 and 22 on the connector 20. As also shown in Fig. 10 the connector half 20 is secured to the U-clamp 16 on the leg 1 or 3 by screws or bolts 26 which engage in screw-threads in the bores 20a in the connector halves 20. The lower rail 14 is engaged with the associated connectors
20 20 on the rear legs 2 and 4 in a similar manner.

As shown in Fig. 11, the upper rail 11 comprises a section of extruded metal such as aluminium which is provided on one side with a projecting tongue 27 for engagement in a channel formed between the bead or ridge 19 and the main body of the connector 15. The lower surface of the rail engages on one of the flanges
25 18 of the connector. Fig. 11 also shows that the connector half 15 of the upper connector is secured to the U-clamp 16 on the leg 1 by screws or bolts 25 which engage in screw-threads in the bores 15a in the connector half 15. The upper rail 11 is engaged with the associated connector 15 on the other front leg 3 in a similar manner.

A work surface can be supported on the front rail 11 by means of support brackets 31. As shown in Fig. 11, each bracket 31 is provided at one end with a rounded protrusion 32 which is desired to engage with a rounded recess 28 in the rail 11 and with a channel 33 which is designed to engage over a bead 29 on the rail 11. Each bracket 31 is provided at its other end with a work surface supporting surface 34 which, when the bracket is installed on the rail 11, is substantially horizontal.

As shown in Fig. 13, the upper rail 12 also comprises a section of extruded metal such as aluminium which, like the rail 11, is provided on one side with a projecting tongue 36 and, on the other side, with a series of upwardly extending tongues 37. The upper rail 12 can be secured to the upper connector 15 on the rear leg 2 by engaging the tongue 36 in a channel formed between the bead or ridge 19 and the main body of the connector 15 as shown in Fig. 13. Again, the lower surface of the rail 12 engages on one of the flanges 18 of the connector. The upper rail 12 is secured to the associated connector plates on the other rear leg 4 in a similar manner. The upwardly extending tongues 37 on the other side of the rail 12 enable a bracket 41 provided on one side with a series of downwardly extending tongues 42 to be hooked over the tongues 37 in order to secure the bracket 41 to the rail 12 by inter-engagement of the tongues 37 and 42 as shown in Fig. 13. The bracket 41 is provided on its other side with a substantially planar surface 43 for supporting a surface (not shown in Fig. 13) and with a projecting rib 44 for engaging and retaining a work surface on the bracket as shown in Fig. 20 of the drawings.

The legs of the desk are desirably provided with adjustable feet 51 (Fig. 10) which can be connected to the bottoms of the legs by means of connectors 52. As shown in Figs. 14 and 15, each connector 52 has a screw-threaded bore 53 for the reception of a screw 54 extending from a foot 51. A lock nut 55 is engaged on the screw 54 and the foot 51 can be adjusted by turning it with respect to the leg to which it is fitted. The connector 52 is a force-fit in the lower end of the leg.

Extension poles may be fitted to the upper ends of one or more of the legs for the purpose of mounting equipment such as monitor screens or upper level shelves. The extension poles are desirably fitted to the upper ends of the legs by means of a spigot 61 which, as shown in chain lines in Fig. 13, is adapted to fit into the top
5 of a leg. As shown in Figs. 16 and 17, the spigot 61 has a stepped bore 62 which is adapted to receive an extension pole 63 (see Figs. 25 and 26).

By means of the connection of the rails 11-14 to the legs 1-4, any desired configuration of work top surface may be employed. A basic form of assembled desk is shown in Fig. 18 in which a work surface 70 is supported on the support
10 brackets 31. However, an additional surface could also be supported on the brackets 41 at a lower level than the work surface 70.

Since the tongues 36 and the tongues 42 are spaced apart by an equal distance, the height of the brackets 41 can be adjusted with respect to the rail 12 simply by moving the brackets up or down the rail. In Fig. 13, the lowermost tongue 42
15 is not engaged with a tongue 36 and the brackets could be lowered so that only the top two tongues 42 are engaged with the tongues 36. Alternatively, the brackets 41 could be raised so that only the lower two or three tongues 42 are engaged with the tongues 36.

It is also possible to utilise the rear legs 2 and 4 of one desk as the rear legs of
20 a second facing desk. Such a configuration is shown in Fig. 19 in which each of the desks has an upper work surface 70 supported on respective brackets 31. In this case, the left hand desk as shown in the drawing has a lower work surface 71 which is supported on a lower part of the brackets 31 while an equipment bin 72 for a monitor control keyboard 73 is rotatably mounted on the lower part of the
25 brackets 31 of the right hand desk. It will be noted that, in this case, the rails 11 are mounted on the rear legs 2 and 4 instead of the front legs 1 and 3 so that the brackets 31 extend from the rear legs. This results in a desk having a relatively narrow configuration.

Fig. 20 shows a further configuration again utilising the rear legs 2 and 4 for two facing desks but in this case, the front rails 11 are connected to the front legs 1 and 3. The upper work surface 70 of the left hand desk is extended by a supplementary work surface 74. One edge of the work surface 74 is butted
5 against an edge of the work surface 70 and its opposite edge rests on the upper edge of a rail 12 on the rear legs 2 and 4. The work surface 74 is further supported in its central region by a support 75 which is engaged in channels 76 and 77 in the rail 11 and bracket 31 respectively (see Fig. 11). The right hand desk is similar to the right hand desk shown in Fig. 19 but in this case the
10 brackets 31 are connected to the front legs 1 and 3 and a further work surface 78 is supported on brackets 41 which are connected to the rail 12 which in turn is connected to connectors 15 on the rear legs 2 and 4.

Yet another configuration is shown in Fig. 21 in which two sets of front legs 1 and 3 are interconnected by a modified adjustment member 66 which is similar
15 to the adjustment member 6 but which is not secured to the desk legs and which is adapted to receive a front adjustment member 5 at each end. Two work surfaces 70 are supported on respective brackets 31 and a further work surface 79 is supported by and extends between the work surfaces 70.

In Figs. 18 to 21, connectors 15 and 20 are shown on the legs 1 and 2 instead of
20 U-clamps 16. However, this is simply a matter of choice and either U-clamps or connectors may be fitted.

Fig. 22 shows another configuration which is similar to that shown in Fig. 18 but in which the brackets 41 are replaced by brackets 81 each of which has a tongue 82 engaging a tongue 37 of the rail 12. In this case, the rear legs 2 and 4 are
25 longer than the front legs 1 and 3 and the connectors 15 are so arranged on the rear legs 2 and 4 that a flange 83 on each of the brackets 81 is located at substantially the same height as the top of the legs 1 and 3. A lower work surface 72 can then be arranged to rest on the upper front rail 33. A monitor screen 84 can then be located on the work surface 72.

A modification of the configuration shown in Fig. 22 is shown in Figs. 23 and 24 in which the brackets 81 are replaced by a platform 85 which has a wall 86 at one side terminating in a tongue 87 which is engageable with a tongue 37 on the rail 12. The other side of the platform has a wall 88 provided with projections 89 and 90 which are engageable in grooves 91 and 92 in the rail 11 (see Fig. 11). A pair of scissor arms 93 are slidably mounted at one end on the platform 85 and at the other end on the lower face of a platform 94 for supporting a monitor screen 84. The monitor screen is preferably movably mounted on the platform 94 so that it can be moved towards or away from the front of the desk when the scissor arms are moved from the retracted position shown in Fig. 23 to the extended position shown in Fig. 24. This sliding forward of the monitor screen facilitates replacement.

In the form of desk shown in Figs. 25 and 26, not only are the rear legs 2 and 4 of the desk longer than the front legs 1 and 3, as in Figs. 22-24, but one of the rear legs is also fitted with a spigot 61 into which an extension pole 63 is fitted. A series of slots 64 are provided in the wall of the pole for receiving tongues 65 projecting from a support 66 for a platform 67 supporting a raised monitor screen 68. As shown in Fig. 26, this form of desk according to the invention is equipped with two monitor screens 84 which are arranged to rest on a work surface 74 extending between the top of connectors 15 on the rear legs 2 and 4 and supports 75 mounted on the front rail 11. The main work surface 70 also rests at one edge on the support 75 and is supported by brackets 31. An equipment bin 72 containing a keyboard 73 is located between the two monitor screens as shown in Fig. 26.

An alternative form of desk is shown in Fig. 27 in which an extension pole 63 is fitted to each of the rear legs 2 and 4 and a shelf 69 is mounted on the tops of the extension poles. The shelf may take the form of a pivotally mounted lid.

In the form of desk shown in Fig. 28, an additional intermediate rear leg 2a of the desk is provided and is fitted with an extension pole 63. In this case a shelf 80 extends between and is fitted to the extension poles 63 and a raised monitor screen 68 is mounted on the shelf.

- 5 The configuration shown in Fig. 29 is similar to that shown in Fig. 28 but in this case there is no intermediate leg 2a and extension poles 63 are fitted to both of the rear legs 2 and 4. A shelf 80 extends between and is fitted to the extension poles 63 and three raised monitor screens 68 are mounted on the shelf.

- Fig. 30 shows an arrangement in which essentially two of the desks shown in Fig. 29 are fitted together. In this case, two connector halves 15 are fitted to each other on each of the central legs of the combined desk, the U-clamps 16 merely being used at the ends of the desk. Each of the three rear legs of the desk is fitted with an extension pole 63 and a lamp 97 is mounted at the upper end of each of the extension poles.

- 15 A narrow form of desk according to the invention is illustrated in Fig. 31 in which no upper connectors are fitted to the front legs 1 and 3 but instead a rail 11 is fitted by means of upper connectors 15 to the rear legs 2 and 4. Brackets 31 are fitted to the rail 11 and support a work surface 70. This arrangement is otherwise similar to the configuration shown in Fig. 18 but it will be seen that, by fitting the rail 11 and the brackets 31 to the rear legs of the desk, a much narrower desk can be achieved. Further connectors 15 are mounted on the rear legs above the connectors for the rail 11 and a rail 12 is engaged with these further connectors. A support bracket 95 for a flat screen monitor 96 is fitted to the rail 12.

- 25 Fig. 32 illustrates a further configuration of desk which is similar to the configuration shown in Fig. 25 but in this case the desk is equipped with a slat wall assembly which is fitted to the rear legs of the desk. The slat wall assembly

is constructed from a series of rails 46 the lowermost one of which is fitted to the upper ends of the rear legs 2 and 4 of the desk. The rails are so configured that the lower face of each rail is adapted to engage with the upper face of the rail located immediately below it. Six rails are shown in Fig. 32 but more or less
5 rails may be provided as desired. One or more shelf brackets 47 may be fitted to the rails 46.

A slat wall assembly is also fitted to the desk configuration shown in Fig. 33 which basically consists of two facing desks, each desk having two front legs but the same rear legs serving for both desks. In this case the rear or centre legs are
10 fitted with adjustment members 6 extending from both sides for engagement with respective adjustment members 5 extending from the front or outer legs. No connectors are fitted to the outer legs but rails 11 are fitted to both sides of connectors 15 mounted on the centre legs. Work surfaces 70 are supported by brackets 31 which are engaged with both of the rails 11. The lowermost rail 46
15 of the slat wall assembly is engaged with further connectors 15 on the centre legs of the desk and flat screen monitors 96 can be fitted to suitable rails 46 on both sides of the slat wall assembly. Trolleys 98 for various electric and electronic components are provided which are adapted to fit under the work surfaces 70 between the brackets 31.

20 It will thus be seen that a great number of desks of different configurations can be created by means of the invention and that it is also possible to combine desks using the same legs for adjacent ends of desks. A continuous work surface may extend beyond the length of a single desk as shown in Fig. 34 in which the ends of two adjacent desks are butted together. The desks need not be rectangular but
25 could be inclined at one or both ends. Alternatively, desks could be arranged at an angle to one another as shown in Fig. 35 of the drawings. In this case a connecting strip 30 is secured to the legs 1 and 3 of the desks at adjacent ends.

The depth of the various desk configurations can be changed by fitting the rail 11 to the front or rear legs of the desk. However, fine adjustment can be achieved by means of the adjustment members 5, 6 and 60 which preferably take the form of flanged plates.

- 5 The invention is not restricted to the above-described embodiments but variations and modifications may be made without departing from the scope of the invention. For example, the lower front rail 13 may be omitted if desired. Further, the desk shown in Fig. 18 could be fitted with a lower work surface 71 and/or with an equipment bin 72 containing a keyboard 73 as well as with one or more extension
- 10 poles 63 or slat wall rails 97. The desks shown in Figs. 19 and 20 could also be fitted with extension poles 63 or slat wall rails 46 while the desk shown in Fig. 21 could be fitted with one or more equipment bins 72 containing keyboards 73. Likewise, the desks shown in Figs. 22-24 could also be fitted with one or more extension poles 63 or slat wall rails 46.
- 15 It will be seen that, by means of the invention, it is possible readily and quickly to construct a desk having any desired width, length, shape and configuration. Since the horizontal rails are located in front of the upright legs and can be of any desired length, the location of the legs is not important and the legs do not have to be positioned at the corners of a desk. The work surfaces can be cantilevered
- 20 in order to leave space for an operator's legs and it is also possible for the work surfaces to be ergonomically designed. Two people can be placed around a central spine at facing desks and supports can be shared along a run of desks made according to the desking system of this invention.

CLAIMS

1. A desking system which comprises a plurality of substantially vertical elongate members and at least one substantially horizontal work surface, wherein means are provided for adjusting the depth of the desk and/or the length of the desk.
2. A desking system according to claim 1, wherein four substantially vertical elongate members are provided which are adapted to be connected, at or adjacent to each end of a desk of the desking system, by the depth adjustment means which comprise a first member secured to one of the elongate members and a second member secured to the other elongate member at or adjacent to the same end of the desk, the two members of the adjustment means being adapted to be releasably connected together in a variety of different locations according to a desired spacing between the substantially vertical elongate members in order to achieve a desired depth of desk.
3. A desking system according to claim 2, wherein the members of the adjustment means take the form of plates which may be detachably or permanently secured to the respective substantially vertical members.
4. A desking system according to any one of the preceding claims, wherein the substantially vertical elongate members take the form of tubular legs of substantially circular cross-section.
5. A desking system according to claim 4, wherein the legs at or adjacent to one end of the desk are connected to the legs at or adjacent to the other end of the desk by at least one rail which may be of any suitable length in order to obtain a desk having a desired length.

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6. A desking system according to claim 5, wherein the rails comprise extruded sections of a metal alloy such as steel or aluminium.

7. A desking system according to claim 5 or claim 6, wherein the rails are adapted to receive support members for a work surface of the desk, said support members being engageable with a rail extending between the front legs of the desk and/or with a rail extending between the rear legs of the desk in order to vary the depth of the desk.

8. A desking system according to any one of the preceding claims, wherein at least one leg of one desk is utilised as a leg of a second desk attached to the said one desk, said second desk extending away from the said one desk at any desired angle.

9. A desking system according to any one of the preceding claims, wherein at least one of the substantially vertical elongate members is provided at its upper end with a spigot adapted to receive an extension pole for a support bracket, shelf and/or a lamp.

10. A desking system according to any one of claims 1 to 8, wherein the substantially vertical elongate members at the rear of the desk are adapted to receive a rail and wherein the rail is provided with means for engaging a like rail in such a manner that a wall of rails can be created at the rear of the desk.

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