

DESK SYSTEM

TECHNICAL FIELD OF THE INVENTION

This invention is related to a desk system, and more particularly to a desk
5 system that is configurable in dimension, expandable, and equipped with
detachable overhead cabinet module.

BACKGROUND OF THE INVENTION

Nowadays there are various types of desk system that can be configured in
10 accordance with the requirements of users and office dimension. These desk
systems permit the flexibility in office arrangement in order to subdivide office
space into individual work units. This is normally achieved by relying on the
concept of employing partitions, walls, or panels. Further, this concept also
provides support to worktops, and accessories such as drawers, cabinets,
15 and racks. These desk systems also are able to provide high capacity power
to particular work units and facilitate the interconnection of a range of office
equipments such as telephones, computers, fax machines, and lamps. These
functions are made possible as the desk systems provide spaces and
raceways for electrical, communication, and data cabling. Typically, the desk
20 systems comprise worktops, accessories, partitions, and wiring raceways,
which are interconnected with support structures. The partitions extend from
the floor, the worktops may be mounted at intermediate positions, and
accessories may be located at either the floor level or overhead.

25 In U.S. patent no. 7,278,360, there is disclosed a desk system incorporating
power and communication capability. Each desk system comprises a
worksurface, which is supported by a pair of leg, and at least one stanchion is
extending upward from the worksurface. The stanchion has an interior cavity
that allows the placement of one or more power and communication supply
30 blocks. In addition, there is a primary power distribution system located
beneath the worksurface, which is passed from one desk section to another
via an opening formed in the legs.

In another U.S. patent no. 6,196,648, there is disclosed a desk system having stanchion supported overhead storage cabinet. The desk system basically includes a support structure comprising a plurality of support panels, and a plurality of stanchions mounted to the support panels by means of fastener.

5 These stanchions extend upward and through the openings in the worksurface and lower panel of the overhead cabinet. Additionally, the support structure includes a lower raceway with removable cover plates for running electrical and communication wiring.

10 However, these desk systems are limited in number of degrees of variability and configurations. The configuration of the desk system is permanent, therefore posing problems if another configuration was needed for expansion in the future time. Moreover, partitions, walls, or panels must be used throughout the entire desk system where they may no otherwise be required.

15 Therefore, most of the designs of available desk systems possess limitations in terms of flexibility.

Therefore, it is an aim of this particular invention to address the aforementioned technical disadvantages by providing a desk system that is
20 configurable in dimension, expandable, and equipped with detachable overhead cabinet module. As will be seen more fully below, the present invention is substantially different in structure, methodology, and approach from that of prior desks.

25 **SUMMARY OF THE PRESENT INVENTION**

The present invention involves a desk system that is configurable in dimension, expandable, and equipped with detachable overhead cabinet module. The desk system includes at least two non-handed leg assemblies, at least one wiring raceway, at least one worktop, and at least one detachable
30 overhead cabinet module. The wiring raceway is positioned between the two non-handed leg assemblies to form a support structure for the worktops, and detachable overhead cabinet module. The worktops, which provide a flat surface for users to write or type, are placed and secured to the top of the

support structure. The detachable overhead cabinet module is connected to the edges of the non-handed legs assemblies.

5 It is a benefit of this present invention to introduce a desk system that is configurable in dimension, specifically in terms of width. The width of the desk system can be changed according to the needs of users by adjusting the position of connectors within a bridge, which are presented in the non-handed leg assembly.

10 It is another benefit of this present invention to introduce a desk system that is configurable in dimension, specifically in terms of length. The length of the desk system can be changed according to the needs of users by adjusting the overlapping area of first beam and second beam, which are presented in the wiring raceway.

15 It is a further benefit of this present invention to introduce a desk system that can be expanded according to the needs of users by adding additional non-handed leg assemblies, wiring raceways, and worktops to the existing desk system.

20 It is also a benefit of this present invention to introduce a desk system that includes a detachable overhead cabinet module comprising at least one cabinet, which can be repositioned along the horizontal bars.

25 **BRIEF DESCRIPTION OF THE DRAWINGS**

The above mentioned and other features and objects of this invention, and the manner of constructing them, will become more apparent and better understood by reference to the accompanying drawings:

30 Figure 1A illustrates the perspective view of a desk system with detachable overhead cabinet module;

Figure 1B illustrates the perspective view of the skeleton structure of the desk system.

5 Figure 2 illustrates the perspective view of a support structure formed by non-handed leg assemblies and wiring raceway;

Figure 3 illustrates the exploded view of the support structure formed by non-handed leg assemblies and wiring raceway;

10 Figure 4A illustrates the top view of a connector of non-handed leg assembly;

Figure 4B illustrates the bottom view of the connector of non-handed leg assembly;

15 Figure 4C illustrates the side view of the connector of non-handed leg assembly;

Figure 5 illustrates the front view of a bridge of non-handed leg assembly;

20 Figure 6A illustrates the perspective view of a first beam of wiring raceway;

Figure 6B illustrates the perspective view of a second beam of wiring raceway;

25 Figure 7 illustrates the perspective view of the desk system without the detachable overhead cabinet module;

Figure 8 illustrates the exploded view of the detachable overhead cabinet module;

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Figure 9 illustrates the perspective view of the desk system with detachable overhead cabinet module having two cabinets.

Figure 10A illustrates a desk system with a rectangular configuration to accommodate two users;

5 Figure 10B illustrates a desk system with a rectangular configuration to accommodate four users;

Figure 10C illustrates a desk system with a rectangular configuration to accommodate six users;

10 Figure 11A illustrates a desk system with a universal configuration to accommodate two users; and

Figure 11B illustrates a desk system with a universal configuration to accommodate four users.

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Although the accompany drawings represent an embodiment of the present invention, the drawings are not necessarily to scale and certain features may be exaggerated in order to better illustrate and explain the present invention.

20 **DETAILED DESCRIPTION OF THE PRESENT INVENTION**

The above mentioned and other features and objects of this invention, and the manner of constructing them, will become more apparent and better understood by reference to the following detailed description. It should be understood that the detailed description made known below is not intended to
25 be exhaustive or limit the invention to the precise form disclosed as the invention may assume various alternative orientations and constructing steps. On the contrary, the detailed description covers all the relevant modifications and alterations made to the present invention, unless the claims expressly state otherwise.

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Figure 1A and Figure 1B generally depict the desk system of the present invention. The desk system includes at least two sets of non-handed leg assembly (10), at least one wiring raceway (11), at least one worktop (12),

and a detachable overhead cabinet module (13). The wiring raceway (11) is positioned between the two non-handed leg assemblies (10) to form a support structure for the worktops (12), and detachable overhead cabinet module (13). The worktops (12), which provide a flat surface for users to write or type, are placed on top of the support structure and secured by means of screws, nuts, bolts, and the like. The detachable overhead cabinet module (13) is generally connected to the non-handed legs assemblies (10).

Referring to Figure 2 and Figure 3, the non-handed leg assembly (10) comprises two pillars (14), two pillar covers (15), two pillar sleeves (16), two pillar caps (17), two gliders (18), two connectors (19), two connector caps (20), a bridge (21), two bridge caps (22), at least two connector brackets (23), at least two bridge brackets (24), at least two connector wire channel (43), and at least two bridge wire channel (44). The primary function of the non-handed leg assembly (10) is to provide support to the worktops (12) along its width.

Still referring to Figure 2 and Figure 3, the pillar (14) is made of preferably but not limited to light alloy material and can be deployed as left or right pillar (14) interchangeably to facilitate fast installation. Furthermore, the pillar (14) has a unique cavity along its height, which strengthens the profile while providing space for electrical and communication wiring. The pillar cover (15) is designed to perfectly fit the cavity for easy installation. In addition, the pillar cover (15) is employed to conceal the electrical and communication wiring within the cavity of the pillar (14). The pillar sleeve (16), which is made of preferably but not limited to plastic material, is inserted into the top part of the pillar (14), and positioned above the pillar cover (15), for protecting the electrical and communication cables from undesired cuts by the sharp corners. The bottom end of the pillar (14) is fitted with the pillar cap (17) for covering the sharp edges of the pillar (14) and preventing the users from unwanted cuts while using the desk system. The pillar cap (17) is made of preferably but not limited to plastic material. In addition, the glider (18), which is meant for increasing the wear and tear level of the pillar (14), is

incorporated into the bottom part of the pillar cap (17). Therefore, the bottom part of the pillar (14) is not in contact with the floor surface, thus avoiding any regular frictional forces experienced when shifting the desk system. Therefore, the usage period of the pillar (14) is prolonged.

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Referring now to Figure 2, Figure 3, and Figure 5, the bridge (21), which is made of preferably but not limited to light alloy material, is hollow. The bridge (21) has an irregular shape, wherein each of the top and the bottom portions of the bridge (21) has a groove along its width; wherein each of the left and right portions of the bridge (21) has two grooves along its width. The groove on the top portion of the bridge (21) is meant for attachment with the cabinet module (13), whereas the grooves on the left and right portions of the bridge (21) are meant for attachment with the bridge brackets (24), the bridge wire channels (44), and the wiring raceway (11). The bridge brackets (24) are attached to the bridge (21) by means of screws, bolts, nuts, and the like, means for providing further support to the worktops (12). The bridge wire channel (44) is attached to the bridge (21) by means of clipping mechanism as said bridge wire channel (44) has a clipping means that complements the shape of the groove presented on said bridge (21). The bridge wire channel (44) functions to hold the electrical and communication wiring in place to prevent said wiring from dangling below the worktop (12). The bridge cap (22) is attached to each end of the bridge (21) to cover the sharp edges.

Referring back to Figure 2 and Figure 3, the pillar (14) and the bridge (21) are joined to each other by employing the connector (19) that is made of preferably but not limited to light alloy material. The shorter arm (30) of the connector (19) is inserted into the top part of the pillar (14), whereas the longer arm (29) of the connector is inserted into the bridge (21) that is positioned horizontally. The width of the desk system is adjustable as the longer arm (29) of the connector (19) is slideable within the bridge (21). Referring now to Figure 4A, Figure 4B, and Figure 4C, the bottom portion of the longer arm (29) of the connector (19) includes a plurality of hole (31). When the desired desk system width is achieved, the position of the longer

arm (29) of the connector (19) within the bridge (21) is secured and locked by means of fastening method with screws, bolts, nuts, and the like through the bridge (21) and said particular hole (31). The connector cap (20) is attached to the top portion of the connector (19) to cover the sharp edges. Further, the
5 connector bracket (23) is attached to the longer arm (29) of the connector (19) by means of screws, bolts, nuts, and the like, means for providing further support to the worktops (12). The position of the connector brackets (23) is higher than the position of the bridge brackets (24) because of gap created by thickness difference between the connector (19) and the bridge (21). In
10 addition, the connector wire channel (43) is also attached to the longer arm (29) of the connector (19) by means of screws, bolts, nuts, and the like. The connector wire channel (43) functions to hold the electrical and communication wiring in place to prevent said wiring from dangling below the worktop (12).

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Referring now to Figure 2, Figure 3, Figure 6A, and Figure 6B, the wiring raceway (11) comprises a first beam (25), a second beam (26), two beam plates (27), and a plurality of beam sleeve (28). Both the first beam (25) and second beam (26) are made of preferably but not limited to bendable sheet
20 metals, and hence they can be formed according to the required shapes. Referring only to Figure 6A, the first beam (25) includes a plurality of bores (41) on the edge of one side along said first beam (25) length. In a preferred embodiment, the bores (41) can be on the edge of either side along said first beam (25) length. In another preferred embodiment, the bores (41) can be on
25 the edges of both sides along said first beam (25) length. Referring now to Figure 6B, the second beam (26) includes a plurality of slots (42) on the edge of one side along said second beam (26) length. In a preferred embodiment, the slots (42) can be on the edge of either side along said second beam (26) length. In another preferred embodiment, the slots (42) can be on the edges
30 of both sides along said second beam (26) length. Subsequently, the first beam (25) and second beam (26) are arranged in a way that they overlap each other to form the wiring raceway (11). This method of arrangement allows the overlapping area to be adjusted by sliding in and out the second

beam (26) within the first beam (25) for the purpose of length extension. This enables the wiring raceway (11) to accommodate and support longer worktops (12). When the first beam (25) and second beam (26) are arranged in such a way, the bores (41) of first beam (25) and the slots (42) of second beam (26) are aligned with each other. Therefore, when the desired desk system length is achieved, the position of the first beam (25) and second beam (26) is secured and locked by means of fastening method with screws, bolts, nuts, and the like through the bores (41) of first beam (25) and slots (42) of second beam (26). The beam plates (27) are affixed to both ends of the wiring raceway (11) formed by the first beam (25) and second beam (26), means for providing attachment areas for the wiring raceway (11) to the non-handed leg assemblies (10), specifically to the bridges (21) of the non-handed leg assemblies (10), and therefore connecting the two non-handed leg assemblies (10) to form the support structure. The wiring raceway (11) can be attached to the bridges (21) at any position along said bridges (21) width. Also, it is possible to include more than one wiring raceway (11) in one desk system according to the requirements of users and the dimension of said desk system. Further, the wiring raceway (11) includes a plurality of opening (32) for insertion of electrical and communication cables. The beam sleeves (28) are placed on the openings (32) to ensure the cables are not exposed to the sharp edges when they are being inserted into openings (32).

Referring now to Figure 7, the worktops (12), which are made of preferably but not limited to wood, are positioned on top of the support structure formed by the non-handed leg assemblies (10) and wiring raceway (11). The position of the worktops (12) is secured to the support structure by means of fastening method with screws, bolts, nuts, and the like. Specifically, the worktops (12) are fastened to the bridge brackets (24) and connector brackets (23). The worktops (12) can be in various shapes including rectangular, irregular wave, and irregular pentagon shapes.

The desk system in accordance with the present invention is configurable in dimension and expandable from time to time to meet the future requirements

of users. Referring to Figure 10A, the desk system is constructed to accommodate two users by employing three non-handed leg assemblies (10), two wiring raceways (11), and two worktops (12). In order to accommodate four users, the dimension of the desk system is reconfigured, specifically in terms of width, by sliding out the connectors (19) from the bridges (21) to increase the desk system width (as shown in Figure 10B). In addition, another two worktops (12) are added to provide working platform for users, and two wiring raceways (11) are attached to the bridges (21) to provide further space for electrical and communication cables. Referring now to Figure 10C, the desk system can be expanded to have room for extra two users by adding another non-handed leg assembly (10), two wiring raceways (11), and two worktops (12) to the existing desk system. Referring now to Figure 11A, the desk system, which is able to accommodate two users, is built to include a more unique configuration. This desk system comprises four non-handed leg assemblies (10), four wiring raceways (11), and two irregular pentagon shaped worktops (12). Three of the non-handed leg assemblies (10) are arranged parallel to each other and connected by two wiring raceways (11). The fourth non-handed leg assembly (10) is arranged perpendicularly to the middle non-handed leg assembly (10) and connected to the system by utilizing two wiring raceways (11). Subsequently, the irregular pentagon shaped worktops (12) are positioned and secured to the support structure. This particular desk system can be configured and expanded to house another two users (as shown in Figure 11B). In order to increase the width of the desk system, the connectors (19) are slid out from the bridges (21) of the non-handed leg assemblies (10), which are arranged parallel to each other. Further, an additional non-handed leg assembly (10) is arranged at the opposite side of the fourth non-handed leg assembly (10) and connected to the system with another two wiring raceway (11). The construction methods of modified desk systems disclosed in this paragraph are generally the same as the construction method described for the unmodified version desk system.

Referring now to Figure 8, the detachable overhead cabinet module (13) comprises two hollow poles (33), two pole brackets (34), two pole caps (35),

four pole connectors (36), two hollow horizontal bars (37), at least one cabinet (38), and at least two cabinet upper brackets (39) and at least two cabinet lower brackets (40) to support one cabinet (38). Each surface of the pole (33) has a groove along its height. The pole (33) is connected perpendicularly to the bridge (21) of the non-handed leg assembly (10) by utilizing the pole bracket (34), for providing primary support to the detachable overhead cabinet module (13). This particular connection is made by first securing the pole bracket (34) to the bottom of the pole (33) by means of fastening method with screws, bolts, nuts, and the like. Subsequently, the pole bracket (34) is securely attached onto the bridge (21), specifically to the groove presented on the top portion of the bridge (21), by means of screws, bolts, nuts, and the like. The upper end of the pole (33) is covered with the pole cap (35). Each surface of the horizontal bar (37) has a groove along its length. The horizontal bars (37) are positioned parallel to each other with a gap distance equivalent to the height of the cabinet (38). Following that, each horizontal bar (37) is connected perpendicularly to the pole (33) by employing the pole connector (36). First, the pole connector (36) is attached to the groove of the pole (33) by means of screws, bolts, nuts, and the like. Consequently, the pole connector (36) is inserted into horizontal bar (37) creating a connection between the pole (33) and the horizontal bar (37), whereby the connection is secured by means of screws, bolts, nuts, and the like. The upper horizontal bar (37) and lower horizontal bar (37) are furnished with at least two cabinet upper brackets (39) and at least two cabinet lower brackets (40), respectively, by means of fastening method with screws, bolts, nuts, and the like, for providing support to one cabinet (38). The cabinet upper brackets (39) and cabinet lower brackets (40) can be repositioned along the horizontal bars (37). Subsequently, the cabinet (38) is securely attached to the cabinet upper brackets (39) and cabinet lower brackets (40) by means of fastening method with screws, bolts, nuts, and the like.

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Beside that, modifications can be made to the detachable overhead cabinet module (13) to include more than one cabinet (38). For example, as shown in Figure 1A, the detachable overhead cabinet module (13) has two cabinets

(38) facing the front and another two cabinets (38) facing the back. In this example, the positions of cabinets (38) are fixed as the length of the cabinets (38) is equal to the length of the horizontal bars (37). In another example, as shown in Figure 9, the detachable overhead cabinet module (13) has two
5 cabinets (38) securely attached to the horizontal bars (37) via said brackets (39 and 40). However, the cabinets (38) can be repositioned along the horizontal bars (37) to alter the arrangement of those cabinets (38) to suit the needs of users. Therefore, the arrangement of cabinets (38) does not have to be symmetrical. Nonetheless, the detachable overhead cabinet module (13) is
10 not compulsory to be included as accessory to this particular desk system. Therefore, it is possible that the desk system comprises only the non-handed leg assemblies (10), wiring raceway (11), and worktops (12) (as shown in Figure 7).

CLAIMS

1. A desk system, which is configurable in dimension and expandable, is characterized by:
 - at least two non-handed leg assemblies (10);
 - 5 at least one wiring raceway (11); and
 - at least one worktop (12);
 - wherein each non-handed leg assemblies (10) comprises two pillars (14), a bridge (21), two connectors (19), at least two connector brackets (23), and at least two bridge brackets (24);
 - 10 wherein the wiring raceway (11) is connected and positioned in between the two non-handed leg assemblies (10) to form a support structure;
 - wherein the worktop (12) is attached to the top of the support structure to provide a platform for working.
- 15 2. A desk system in accordance with claim 1, wherein the wiring raceway (11) comprises:
 - a first beam (25), including a plurality of bores (41) located on at least one of the edges along the length; and
 - a second beam (26), including a plurality of slots (42) located on at
 - 20 least one of the edges along the length;
 - wherein the first beam (25) and second beam (26) are arranged in such a way that they overlap each other to form the wiring raceway (11);
 - wherein the second beam (26) is slideable within the first beam (25);
 - wherein the overlapping area of the first beam (25) and second beam
 - 25 (26) determines the length of the desk system;
 - wherein the position of the second beam (26) within the first beam (25) is secured by fastening method with screws, bolts, nuts, and the like through said bores (41) on first beam (25) and said slots (42) on second beam (26);
- 30 3. A desk system in accordance with claim 2, wherein each end of the wiring raceway (11) is affixed with a beam plate (27), for providing attachment area to the non-handed leg assemblies (10).

4. A desk system in accordance with claim 2, wherein the wiring raceway (11) further comprises a plurality of openings (32) for insertion of electrical and communication cable.
5. A desk system in accordance with claim 4, wherein the opening (32) is covered with a beam sleeve (28), for covering the sharp edges.
6. A desk system in accordance with claim 1 and claim 2, further comprises a detachable overhead cabinet module (13), which is characterized by:
- two poles (33), for providing primary support to the cabinet module (13),
- two pole brackets (34), each pole bracket (34) is attached to the bridge (21) of non-handed leg assembly (10) and to receive the bottom end of the pole (33), for creating a connection between said pole (33) and said bridge (21),
- two horizontal bars (37) positioned parallel to each other with a gap distance equivalent to the height of cabinet (38),
- four pole connectors (36), for joining the poles (33) and horizontal bars (37),
- at least two cabinet upper brackets (39) and at least two cabinet lower bracket (40), for providing support to one cabinet (38); and
- at least one cabinet (38) attached to the cabinet upper brackets (39) and cabinet lower brackets (40);
- wherein the poles (33) are connected perpendicularly to the bridge (21) of non-handed leg assemblies (10);
- wherein the horizontal bars (37) are connected perpendicularly to the poles (33);
- wherein the cabinet upper bracket (39) is attached to the upper horizontal bar (37);
- wherein the cabinet lower bracket (40) is attached to the lower horizontal bar (37);

wherein the cabinet upper brackets (39) and cabinet lower brackets (40) can be repositioned along the horizontal bars (37).

7. A desk system in accordance with claim 6, wherein the upper end of the pole (33) is covered with a pole cap (35), for covering the sharp edges.

8. A desk system in accordance with any preceding claims, wherein the pillar (14) includes a cavity along its height, for providing space for electrical and communication wiring.

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9. A desk system in accordance with claim 8, wherein the cavity of the pillar (14) is covered by a pillar cover (15), for concealing the electrical and communication wiring.

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10. A desk system in accordance with any preceding claims, wherein a pillar sleeve (16) is inserted into the top part of the pillar (14) and positioned above the pillar cover (15), for covering the sharp edges.

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11. A desk system in accordance with any preceding claims, wherein the bottom end of the pillar (14) is covered by a pillar cap (17), for covering the sharp edges.

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12. A desk system in accordance with claim 11, wherein the bottom part of the pillar cap (17) is attached with a glider (18), for preventing the pillar (14) from in contact with the floor surface.

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13. A desk system in accordance with claim any preceding claims, wherein the bridge (21) includes a groove on each top and bottom portions, and two grooves on each left and right portions.

14. A desk system in accordance with claim any preceding claims, wherein each end of the bridge (21) is covered with a bridge cap (22), for covering the sharp edges.

15. A desk system in accordance with claim any preceding claims, wherein the connector (19) includes a shorter arm (30), a longer arm (29), and a plurality of holes (31) located beneath said longer arm (29), for joining the pillar (14) and bridge (21).

16. A desk system in accordance with claim 15, wherein the shorter arm (30) is inserted into the top part of the pillar (14).

17. A desk system in accordance with claim 15, wherein the longer arm (29) is inserted into the bridge (21) and is slideable within said bridge (21).

18. A desk system in accordance with claim 17, wherein the position of the longer arm (29) within the bridge (21) determines the desk system width.

19. A desk system in accordance with claim 17, wherein the position of the longer arm (29) within the bridge (21) is secured by means of fastening method with screws, bolts, nuts, and the like through said bridge (21) and holes (31) of said longer arm (29).

20. A desk system in accordance with any preceding claims,, wherein the top portion of the connector (19) is covered with a connector cap (20), for covering the sharp edges.

21. A desk system in accordance with any preceding claims,, wherein the connector bracket (23) is attached to the longer arm (29) of the connector (19), for providing support to the worktop (12).

22. A desk system in accordance with any preceding claims,, wherein the bridge bracket (24) is attached to the bridge (21), for providing support to the worktop (12).

23. A desk system in accordance with any preceding claims, wherein the connector wire channel (43) is attached to the longer arm (29) of the connector (19), for holding the electrical and communication wiring in place.

- 5 24. A desk system in accordance with any preceding claims, wherein the bridge wire channel (44) is attached to the bridge (21), for holding the electrical and communication wiring in place.