

ITEM OF TRANSFORMABLE FURNITURE

FIELD OF THE INVENTION

The invention relates to an item of transformable furniture, more particularly to an item of furniture transformable from a chair into a desk and vice versa. The item of transformable furniture finds application in the furnishing of conference rooms, offices, training rooms, living quarters, recreation areas.

STATE OF THE ART

Patent application PCT/IB03/00158 of 23.01.2003, publication WO 2004/019730 A1 discloses an item of transformable furniture which consists of two plates, connected by a hinge joint, and a supporting construction consisting of two vertical frames, located parallel to each other and linked by two parallel axes, located at different heights in the space enclosed between the frames. The two plates are located in the space between the frames so that each plate is connected to the frames by means of the first and second axes, in a way ensuring movement of the plates simultaneously with respect to each other and with respect to the axes, which connect the frames, from position "chair" to position "table". In the transformation of the item of furniture from position "chair" to position "table" the first plate performs the function of a seat/worktop, respectively, and the second plate – of a back/front panel, respectively.

Publication of a Bulgarian registration of industrial design No 5140 in Bulletin No 6 of 30.06.2004 makes known an item of transformable furniture which comprises a first and a second plate, connected by a hinge joint, and a supporting construction consisting of two vertical parallel elements, linked by two horizontal parallel axes. A flat element is attached to each plate, serving as a seat/back, respectively. The plates are connected to the supporting construction by means of the first and second horizontal axes of the

supporting construction so that they can rotate round the respective axes, being able to move between a first position of a seat and back and a second position of front panel and worktop and vice versa.

Publication of a Bulgarian registration of industrial design No 5141 in Bulletin No 6 of 30.06.2004 makes known an item of folding transformable furniture which comprises a first and a second plate, connected by a hinge joint, and a supporting construction consisting of two closed frames, connected by a hinge joint. A flat element is attached to each plate, serving as a seat/back, respectively. The plates are linked by means of the first and second horizontal axes of the supporting construction. The axes are the upper parts of each of the two closed frames. The plates together with the flat elements can rotate round the respective axes of the supporting construction, being able to move between a first position of a seat and back and a second position of front panel and worktop.

Patent application BG No108080 of 08.08.2003, published in Bulletin No 4 of 30.04..2005 discloses an item of folding transformable furniture which comprises two plates, connected by a hinge joint, and a folding supporting construction consisting of two frames, connected by a hinge joint, where the two plates are located in the space between the frames, where each of the plates is attached to one of the two frames. This application does not offer a solution providing reliable fixing and locking, respectively unlocking of the folding supporting construction, which would improve the stability of the furniture construction as a whole.

Dutch patent application No 1022740 of 20.02.2003, published on 23.08.2004 in Bulletin No 10/2004, discloses an item of transformable furniture which comprises two plates, connected by a hinge joint, and a supporting construction. The supporting construction is not folding. The supporting construction does not participate in the transformation from chair into table and vice versa, therefore the item of furniture has limited functions, for example it cannot be stacked.

The aim of the invention is to provide a functionally improved, and at the same time easiest to use, construction of an item of transformable furniture. This aim is achieved by a combination of features formulated in each of the independent claims. Embodiments of the invention of particular advantages are formulated in the dependent claims.

SUMMARY OF THE INVENTION

According to a first aspect of the invention, this aim is achieved by an item of transformable furniture which comprises a first plate and a second plate, linked to each other by a hinge joint, where said two plates can rotate respectively round the first and second horizontal axes so that the plates can be moved from a first position as seat and back, respectively, to a second position as front panel and worktop, respectively, and vice versa. Said plates are linked by said first and second horizontal axes, respectively, to a supporting construction which consists of at least three interconnected folding elements. The use of at least three elements allows a more precise fixing of the folding supporting construction.

In a possible embodiment of the invention, said supporting construction consists of three interconnected folding elements, linked to each other by hinge joints, where at least one of the hinge joints can slide with respect to the interconnected folding elements.

In another embodiment of the invention, the folding elements are in the form of frames, where at least one of the folding elements may be in the form of a closed quadrangular frame, while the other two elements are in the form of open frames bent in rectangular shape, where the middle parts of the said frames form the first and second horizontal axes, a third element being connected to the two interconnected folding elements by means of two couples of hinge joints.

In a further embodiment of the invention, there is a locking mechanism at one of the hinge joints.

In another embodiment of the invention, the plate serving as back or worktop is joined to one of the said folding elements so that when said elements are folded the plate is deformable depending on its concrete position from a substantially bent form as back to a substantially flat form as worktop and vice versa.

In a further embodiment of the invention, said first axis is in the form of an elongated, preferably cylindrical, bent element, lying in a horizontal plane, where the said first plate is made of a flexible flat element connected to the said first axis so that in the position of

worktop said bent element provides support for the worktop in the horizontal plane, while in the position of back the said bent element can be pulled in the middle part of said flexible flat element making the flexible flat element take a concave shape, following the shape of the bent element.

In another embodiment of the invention, the item of transformable furniture may contain a locking device to fix the respective position of at least two of said three inwardly or outwardly connected folding elements.

In a further embodiment of the invention, at least one of said axes is slidably connected to the respective plate to enable a change of the positions of the sliding bolt of said plate of said axis, where said position can also be fixed by another locking device.

According to another aspect of the invention, the aim of the invention is achieved by an item of transformable furniture that comprises a first plate and a second plate, connected to each other by a hinge joint, where said two plates can rotate respectively round first and second horizontal axes so that the plates can be moved from a first position as seat and back, respectively, to a second position as front panel and worktop, respectively, where the first plate, serving as back and worktop, is deformable depending on its concrete position from a substantially bent/concave form as back to a substantially flat form as worktop and vice versa.

According to a preferred embodiment of the item of transformable furniture, the plate serves as back or worktop and the same is attached to one of the said folding elements so that when said elements are folded it is deformable depending on its concrete position from a substantially bent form as back to a substantially flat form as worktop and vice versa.

According to a further embodiment of the item of transformable furniture, said first axis is formed as an elongated, preferably cylindrical element with a bent section, lying in a horizontal plane, and said first plate, made of a flexible flat element is attached to this section so that it can rotate, so that in the position of worktop said bent section serves as three-point support, supporting the worktop in a plane, while in the position of back said bent section pulls the flexible element that touches the ends of the elongated element,

shaping it so that the flexible element takes a concave shape, following the shape of said bent section.

According to another embodiment, the item of transformable furniture in addition contains a locking device to fix in the respective relative position at least two of said three connected and folding elements.

According to a further embodiment of the item of transformable furniture, at least one of the said axes is attached to the respective plate so that it can slide and move the position of the point of rotation of said plate with respect to said axis, where said position can be fixed by means of another locking device.

According to a preferred embodiment, the item of transformable furniture, comprising a first plate and a second plate connected to each other by a hinge joint, where said two plates can rotate respectively round first and second horizontal axes so that the plates can be moved from a first position as seat and back, respectively, to a second position as front panel and worktop, respectively, where the first plate, serving as back and worktop, is deformable depending on its concrete position from a substantially concave form as back to a substantially flat form as worktop and vice versa.

According to a further embodiment of the item of transformable furniture, said first axis is formed as an elongated, preferably cylindrical element with a bent section, lying in a horizontal plane, and said first plate, made of a flexible flat element is attached to this section so that it can rotate, so that in the position of worktop said bent section serves as three-point support, supporting the worktop in a plane, while in the position of back said bent section pulls the flexible element, shaping it so that the flexible element takes a concave shape, following the shape of said bent section.

According to another embodiment of the item of transformable furniture, said first plate has inhomogeneous (irregular) ability of deformation.

According to a further embodiment of the item of transformable furniture, one of the couples of joints is capable either of rotation and translation or of rotation only, while the other couple of joints is capable of rotation or translation, and vice versa.

According to a further embodiment of the item of transformable furniture, the fixing device is a locking mechanism consisting of a slot, locking element and spring or a T-shaped slipping bush, peg, spring and button.

According to a preferred embodiment of the item of transformable furniture, the couple of slots are formed longitudinally in the long sides of one of the frames, and at one end the slots end in a circular opening, while at the opposite end they end in a curve, formed as an arc-shaped cutout providing for bayonet locking / respectively unlocking of the supporting construction in unfolded / respectively folded position.

According to a further embodiment of the item of transformable furniture, the couple of T-shaped slipping bushes are located at the long sides of one of the frames and can move along the long sides of the respective frame, and together with the peg, spring and button provide locking / respectively unlocking of the supporting construction in unfolded / respectively folded position.

According to another embodiment, the item of transformable furniture comprises a seat and a back, connected by a hinge joint. Said seat and back can rotate respectively round first horizontal axis and second horizontal axis so that the seat and back can be moved from a first position as seat and back, respectively, to a second position as front panel and worktop, respectively, and vice versa. The seat and back are attached to a supporting construction by means of said first and second horizontal axes. The supporting construction consists of at least three interconnected folding elements. At least two of the folding elements are connected by hinge joints with a coupling element. The coupling element is a flat element, more particularly plate, which is fixed at the upper end of at least of the two folding elements. The coupling element can rotate up to 180° round the respective hinge joint.

DESCRIPTION OF THE FIGURES

Figure 1 is a perspective view of one version of the item of transformable furniture – chair, according to the invention.

Figure 2 is a perspective view of the item of furniture – chair in Fig. 1, transformed into a desk.

Figure 3 shows different views of the supporting construction of the chair in Fig. 1.

Figure 3a is a front view of the supporting construction of the chair.

Figure 3b is a side view of the supporting construction of the chair.

Figure 3c is a top view of the supporting construction of the chair.

Figure 3d is a perspective view of the supporting construction of the chair.

Figure 4 is side view of chair according to the invention, showing the transformation from chair to desk (Figures 4a-4j).

Figure 5 is a perspective view of the supporting construction of the item of transformable furniture – chair, according to the invention.

Figure 6 is a perspective view from below of the item of transformable furniture – desk, according to the invention.

Figure 7 is a perspective view of another version of the item of transformable furniture – chair.

Figure 8 is a perspective view of the item of furniture – chair in Fig. 7, transformed into a desk.

Figure 9 shows different views of the supporting construction of the chair in Fig. 7.

Figure 9a is a front view of the supporting construction of the chair.

Figure 9b is a side view of the supporting construction of the chair.

Figure 9c is a top view of the supporting construction of the chair.

Figure 9d is a perspective view of the supporting construction of the chair.

Figure 10 is side view of chair according to the invention, showing the transformation from chair to desk (Figures 10a-10j).

Figure 11 is a perspective view of the supporting construction of the item of transformable furniture – chair, according to the invention.

Figure 12 is a perspective view from below of the item of transformable furniture – desk, according to the invention.

Figure 13 is a perspective view from below of a further version of the item of transformable furniture in the position of desk, according to the invention.

Figure 14 is a perspective view from below of the item of transformable furniture in Fig. 13 in the position of chair, according to the invention.

Figure 15 is side view of chair according to the invention, showing the transformation from chair to desk (Figures 15a-15j).

Figure 16 is a perspective view from below of a further version of the item of transformable furniture in the position of desk, according to the invention.

Figure 17 is a perspective view from below of the item of transformable furniture in Fig. 16 in the position of chair, according to the invention.

Figure 18 is side view of chair according to the invention, showing the transformation from chair to desk (Figures 18a-18j).

Figure 19 is a perspective view of a further version of the item of transformable furniture in the position of chair.

Figure 20 is a perspective view of the item of transformable furniture in Fig. 19 in the position of desk.

Figure 21 shows different views of the supporting construction of the folding item of transformable furniture – chair in Fig. 19, according to the invention.

Figure 22 is side view of chair according to the invention, showing the transformation from chair to desk (Figures 22a-22j).

Figure 23 is a perspective view of the supporting construction of the item of transformable furniture – chair, according to the invention.

Figure 24 is a perspective view of a further version of the item of transformable furniture in the position of chair.

Figure 25 is a perspective view of a further version of the item of transformable furniture in the position of desk.

Figure 26 shows different views of the supporting construction of the transformable chair to desk (Figures 26a-26d).

Figure 27 is side view of chair according to the invention, showing the transformation from chair to desk (Figures 27a-27j).

Figure 28 is a perspective view of the supporting construction of a version of the folding item of transformable furniture – chair, according to the invention.

Figure 29 is a perspective view of a further version of the item of transformable furniture in the position of chair, according to the invention.

Figure 30 is a perspective view of a further version of the item of transformable furniture in the position of desk, according to the invention.

Figure 31 shows different views of the supporting construction of the transformable chair to desk (Figures 31a-31d).

Figure 32 is side view of chair according to the invention, showing the transformation from chair to desk (Figures 32a-32j).

Figure 33 is a perspective view of the supporting construction of a version of the folding item of transformable furniture – chair, according to the invention.

Figure 34 is a perspective view of a further version of the item of transformable furniture in the position of chair, according to the invention.

Figure 35 is a perspective view of a further version of the item of transformable furniture in the position of desk, according to the invention.

Figure 36 is a drawing of the supporting construction of a version of the folding item of transformable furniture – chair, according to the invention.

Figure 37 is side view of chair according to the invention, showing the transformation from chair to desk (Figures 37a-37j).

Figure 38 is a perspective view of the supporting construction of a version of the folding item of transformable furniture – chair, according to the invention.

Figure 39 is a perspective view of a further version of the item of transformable furniture in the position of chair, according to the invention.

Figure 40 is a perspective view of a further version of the item of transformable furniture in the position of desk, according to the invention.

Figure 41 is a drawing of the supporting construction of a version of the folding item of transformable furniture – chair, according to the invention.

Figure 42 is side view of chair according to the invention, showing the transformation from chair to desk (Figures 42a-42j).

Figure 43 is a perspective view of the supporting construction of a version of the folding item of transformable furniture – chair, according to the invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

According to a first embodiment of the invention, shown in Fig.1-6, the item of transformable furniture consists of two substantially flat elements 17, 18 with attached plates 6, 5 by means of which the flat elements 17, 18 are connected by a hinge joint 4. The flat elements 17, 18 are not located in a plane but are bent in an ergonomic shape, shown in the figures, and can rotate round a first and a second horizontal axes 2, 3, respectively. In this first embodiment the two axes consist of the straight horizontal sections 2, 3 of two of the folding elements, embodied as tubular frames 1, 19 as best shown in Fig. 1-6. The axis 2 passes through slot 7 formed in the plate 5 attached to the first plate 18. The slot 7 allows translation and rotation movement round axis 2. The supporting construction consists of three tubular frames 1, 1', 19. In this way in unfolded position of the supporting construction the two flat elements 17, 18 can be moved between a first position as seat and back and a second position as front panel and worktop, as shown in Fig. 4a to 4e. By means of the axes 2, 3 the flat elements 17, 18 are attached to the supporting construction, which besides the two frames 1, 19 includes at least one more third frame 1' linked to them. Frame 19 is linked to the frames 1, 1' by two couples of hinge joints 20 and 21. The long sides of frame 1 are made of flat oval tube, while the other sides of the frame and frames 1' and 19 are made of round tube. Frame 19 in the position “chair” performs the function of armrest. The locking mechanism of the supporting construction located at hinge joint 20 consists of a couple of slots, locking elements, and springs. The slots are formed longitudinally in the couple of

long sides of frame 1. The slots end at their lower ends in a circular opening, while at the opposite ends the slots end in a curve at acute angle, which is formed as an arc-shaped cutout providing for locking of the supporting construction 1, 1', 19 in unfolded position. The locking takes place as the locking element, which is a locking bolt falls in the arc-shaped (bayonet) cutout of the slot, pushed by the spring. The unlocking takes place by applying pressure to the upper ends of frame 19, whereby the action of the spring is overcome. The hinge joint 20, which links frames 1 and 19, provides rotation and translation longitudinally along the two sides of frame 1. The hinge joint 21, which links frames 1' and 19, provides rotation. The hinge joint 16, which links frames 1 and 1', provides rotation.

According to a second embodiment of the invention, shown in Fig.7-12, the item of transformable furniture consists of two substantially flat elements 17, 18 with attached plates 6, 5 by means of which the flat elements 17, 18 are connected by a hinge joint 4. The flat elements 17, 18 are not located in a plane but are bent in an ergonomic shape, shown in the figures, and can rotate round a first and a second horizontal axes 2, 3, respectively. In this embodiment the two axes consist of the straight horizontal sections 2, 3 of two of the folding elements, embodied as tubular frames 1, 19 as best shown in Fig. 1-6. The axis 2 passes through slot 7 formed in the plate 5 attached to the first plate 18. The slot 7 allows translation and rotation movement round axis 2. The supporting construction consists of three tubular frames 1, 1', 19. In this way in unfolded position of the supporting construction the two flat elements 17, 18 can be moved between a first position as seat and back and a second position as front panel and worktop, as shown in Fig. 10a to 10e. By means of the axes 2, 3 the flat elements 17, 18 are attached to the supporting construction, which besides the two frames 1, 19 includes at least one more third frame 1' linked to them. Frame 19 is linked to the frames 1, 1' by two couples of hinge joints 20' and 21. The three frames 1, 1', 19 of the supporting construction are made of tubes of circular cross-section. The frame 19 in the position "chair" performs the function of armrest. The locking mechanism consists of T-shaped slipping bush, peg, spring and button and is located at hinge joint 20' in the long sides of frame 1. The hinge joint 20', which links frames 1 and 19, provides rotation and translation longitudinally

along the two sides of frame 1. The hinge joint 21, which links frames 1' and 19, provides rotation. The hinge joint 16, which links frames 1 and 1', provides rotation.

According to a third and fourth embodiments of the invention, shown in Fig. 13, 14, 15 and 16, 17, 18, respectively, the item of transformable furniture consists of two substantially flat elements 17, 18 linked directly by a hinge joint 4. The flat element 17 has a bent ergonomic shape, which remains unvaried in the transformation of the item of furniture from chair to worktop and vice versa, evident from the above-mentioned figures. The flat element 18 is flexible mainly in one direction, perpendicular to the direction of the grooves 18a, shown in Fig. 13, 14, 16, 17, and the element 18 is made so that it can change its shape from flat to concave in the transition from the position of worktop to the position of back and vice versa, from concave to flat in the transition from the position of back to the position of worktop. The first axis 2 is formed as an elongated, preferably cylindrical, bent element, lying in a horizontal plane, where the said first plate is made of a flexible flat element 18 linked to the said first axis 2 so that in the position of worktop said bent element 2 provides support for the worktop in the horizontal plane, while in the position of back the said bent element 2 can be pulled in the middle part of said flexible flat element 18 making the flexible flat element 18 take a concave shape, following the shape of the bent element 2. The flat element 17 and the flexible flat element 18 can rotate respectively round a first horizontal axis 2 and a second horizontal axis 3. The axes 2 and 3 are essentially the straight horizontal parts of the respective frames 1, 19. In this way the flat element 17 and the flexible flat element 18 can be moved between a first position as seat and back and a second position as front panel and worktop. The middle part 2a of the first horizontal axis 2 is bent in the horizontal plane of the axis, in moving the flexible flat element 18 from the position of worktop to the position of back the same is pulled by plate 5', which in the concrete exemplary embodiment performs the function of leading box. The hinge joint 20, which links frames 1 and 19, provides rotation and translation longitudinally along the two sides of frame 1. The hinge joint 21, which links frames 1' and 19, provides rotation. The hinge joint 16, which links frames 1 and 1', provides rotation.

In the fourth embodiment of the invention the supporting construction comprises two parallel horizontal axes 2, 3 located at different levels, fixed to two lateral vertical elements 1, and the flat element 17 and the flexible flat element 18, as described above, are linked by a hinge joint 4, the axis of which is parallel to the horizontal axes 2, 3. Axes 2 and 3 are located in the space enclosed by the couple of long sides of frame 1. The couple of long sides of frame 1 can be made as closed frames of trapezium shape. The same can be formed as closed or open frames of trapezium, rectangular, square or elliptic shape. The lateral vertical elements 1 can be made as solid elements. The middle part 2a of the first horizontal axis 2 is bent in the horizontal plane of the axis, in moving the flexible flat element 18 from the position of worktop to the position of back the flat element 18 is pulled by plate 5', which in the concrete exemplary embodiment performs the function of leading box.

According to a fifth embodiment of the invention, shown in Fig. 19-23, the item of transformable furniture consists of two substantially flat elements 17, 18 with attached plates 6, 5 by means of which the flat elements 17, 18 are connected by a hinge joint 4. The flat elements 17, 18 are not located in a plane but are bent in an ergonomic shape, shown in the figures, and can rotate round a first and a second horizontal axes 2, 3, respectively. As shown in the first exemplary embodiment, the two axes consist of the straight horizontal sections 2, 3 of two of the folding elements, embodied as tubular frames 1, 19 as best shown in Fig. 1-6. The axis 2 passes through slot 7 formed in the plate 5 attached to the first plate 18. The slot 7 allows translation and rotation movement round axis 2. The supporting construction consists of three tubular frames 1, 1', 19. In this way in unfolded position of the supporting construction the two flat elements 17, 18 can be moved between a first position as seat and back and a second position as front panel and worktop, as shown in Fig. 22a to 22e. By means of the axes 2, 3 the flat elements 17, 18 are attached to the supporting construction, which besides the two frames 1, 19 includes at least one more third frame 1' linked to them. Frame 19 is linked to the frames 1, 1' by two couples of hinge joints 20'' and 21. A locking mechanism is located at hinge joint 21 that links frames 1 and 19, which provides rotation, while hinge joint 20'' provides rotation and translation on the two sides of frame 1' by means of a locking mechanism. The locking mechanism is a slot, locking element and spring or T-shaped

slipping bush, peg, spring and button. The front end of frame 19 descends until it is parallel to frame 1, while the lower end of frame 1' moves to a position parallel to frame 1 by rotation in hinge joint 16.

According to a sixth embodiment of the invention, shown in Fig. 24-28, the item of transformable furniture consists of two substantially flat elements 17, 18 with attached plates 6, 5 by means of which the flat elements 17, 18 are connected by a hinge joint 4. The flat elements 17, 18 are not located in a plane but are bent in an ergonomic shape, shown in the figures, and can rotate round a first and a second horizontal axes 2, 3, respectively. As shown in the first exemplary embodiment, the two axes consist of the straight horizontal sections 2, 3 of two of the folding elements, embodied as tubular frames 1, 19 as best shown in Fig. 1-6. The axis 2 passes through slot 7 formed in the plate 5 attached to the first plate 18. The slot 7 allows translation and rotation movement round axis 2. The supporting construction consists of three tubular frames 1, 1', 19. In this way in unfolded position of the supporting construction the two flat elements 17, 18 can be moved between a first position as seat and back and a second position as front panel and worktop, as shown in Fig. 27a to 27j. By means of the axes 2, 3 the flat elements 17, 18 are attached to the supporting construction, which besides the two frames 1, 19 includes at least one more third frame 1' linked to them. Frame 19 is linked to the frames 1, 1' by two couples of hinge joints 20''' and 21. The hinge joint 21 provides rotation, while the hinge joint 20''' provides rotation and translation forward on the two sides of frame 19 by means of a locking mechanism, where the front end of frame 19 descends until it is parallel to frame 1, while the lower end of frame 1' moves to a position parallel to frame 1 by rotation in hinge joint 16.

According to a seventh embodiment of the invention, shown in Fig. 29-33, the item of transformable furniture consists of two substantially flat elements 17, 18 with attached plates 6, 5 by means of which the flat elements 17, 18 are connected by a hinge joint 4. The flat elements 17, 18 are not located in a plane but are bent in an ergonomic shape, shown in the figures, and can rotate round a first and a second horizontal axes 2, 3, respectively. As shown in the first exemplary embodiment, the two axes consist of the straight horizontal sections 2, 3 of two of the folding elements, embodied as tubular frames 1, 19 as best shown in Fig. 1-6. The axis 2 passes through slot 7 formed in the

plate 5 attached to the first plate 18. The slot 7 allows translation and rotation movement round axis 2. The supporting construction consists of three tubular frames 1, 1', 19. In this way in unfolded position of the supporting construction the two flat elements 17, 18 can be moved between a first position as seat and back and a second position as front panel and worktop, as shown in Fig. 32a to 32j. By means of the axes 2, 3 the flat elements 17, 18 are attached to the supporting construction, which besides the two frames 1, 19 includes at least one more third frame 1' linked to them. Frame 19 is linked to the frames 1, 1' by two couples of hinge joints 20'''' and 21'. The hinge joint 21' provides rotation, while hinge joint 20'''' provides rotation and translation forward on the two sides of frame 19 by means of a locking mechanism, where the front end of frame 19 descends until it is parallel to frame 1, while the lower end of frame 1' moves to a position parallel to frame 1 by rotation in hinge joint 16.

According to an eighth embodiment of the invention, shown in Fig. 34-38, the item of transformable furniture consists of two substantially flat elements 17, 18 with attached plates 6, 5 by means of which the flat elements 17, 18 are connected by a hinge joint 4. The flat elements 17, 18 are not located in a plane but are bent in an ergonomic shape, shown in the figures, and can rotate round a first and a second horizontal axes 2, 3, respectively. As shown in the first exemplary embodiment, the two axes consist of the straight horizontal sections 2, 3 of two of the folding elements, embodied as tubular frames 1, 19 as best shown in Fig. 1-6. The axis 2 passes through slot 7 formed in the plate 5 attached to the first plate 18. The slot 7 allows translation and rotation movement round axis 2. The supporting construction consists of three tubular frames 1, 1', 19. In this way in unfolded position of the supporting construction the two flat elements 17, 18 can be moved between a first position as seat and back and a second position as front panel and worktop, as shown in Fig. 38a to 38j. By means of the axes 2, 3 the flat elements 17, 18 are attached to the supporting construction, which besides the two frames 1, 19 includes at least one more third frame 1' linked to them. Frame 19 is linked to the frames 1, 1' by two couples of hinge joints 20'''' and 21''. The hinge joint 20'''' provides rotation, while the hinge joint 21'' provides rotation and translation backwards on the two sides of frame 19 by means of a locking mechanism, where the front end of

frame 19 descends until it is parallel to frame 1, while the lower end of frame 1' moves to a position parallel to frame 1 by rotation in the hinge joint 16.

According to a ninth embodiment of the invention, shown in Fig. 39-43, the item of transformable furniture consists of substantially flat elements seat 17 and back 18, respectively front panel 17 and worktop 18, connected by a hinge joint 4. The seat 17 and back 18 are not located in a plane but are bent in an ergonomic shape, shown in the figures, and can rotate round a first and a second horizontal axes 2, 3, respectively. As shown in the third exemplary embodiment, the first axis 2 is formed as an elongated, preferably cylindrical, bent element, lying in a horizontal plane, where the said back 18 is a flexible flat element linked to the said first axis 2 so that in the position of worktop said bent element 2 provides support for the worktop in the horizontal plane. The flat element 17 and the flexible flat element 18 can rotate respectively round a first horizontal axis 2 and a second horizontal axis 3. The axes 2 and 3 are essentially the straight horizontal parts of the respective frames 1, 19. In this way the flat element 17 and the flexible flat element 18 can be moved between a first position as seat and back and a second position as front panel and worktop. The middle part 2a of the first horizontal axis 2 is bent in the horizontal plane of the axis, in moving the flexible flat element 18 from the position of worktop to the position of back. The axis 2 passes through fastening devices on the flat element 18. The supporting construction consists of three tubular frames 1, 1', 19. In unfolded position of the supporting construction the two flat elements 17, 18 can be moved between a first position as seat and back and a second position as front panel and worktop, as shown in Fig. 42a to 42j. By means of the axes 2, 3 the flat elements 17, 18 are attached to the supporting construction, which besides the two frames 1, 19 includes at least one more third frame 1' linked to them. Frame 19 is linked to the frames 1, 1' by two couples of hinge joints 20'''' and 21. The hinge joints 20'''' and 21 provide rotation. Frame 1 is linked to frame 1' by means of two couples of hinge joints 16' and 16'' and plate 30. The hinge joints 16' and 16'' provide rotation. The unfolding, respectively folding, of the supporting construction takes place as plate 30 turns to 180° in the upper end of frame 1 by rotation in the hinge joints 16' and 16'' and rotation in the hinge joints 20''', 21, where the frames 1, 1' and 19 in an intermediary position are aligned and parallel.

CLAIMS

1. An item of transformable furniture, which comprises a first plate (5) and a second plate (6), linked to each other by a hinge joint (4), where said two plates (5), (6) can rotate respectively round first and second horizontal axes (2), (3) so that the plates (5), (6) can be moved from a first position as seat (17) and back (18), respectively, to a second position as front panel (17) and worktop (18), respectively, and vice versa, where said plates are linked by said first and second horizontal axes (2), (3) to a supporting construction, which consists of at least three interconnected folding elements (1), (1'), (19).
2. An item of transformable furniture, according to claim 1, where the said supporting construction consists of three interconnected folding elements (1), (1'), (19), linked to each other by couples of hinge joints (20, 20', 20'', 20''', 20''') and (21, 21', 21'') where one of the couples of hinge joints (20, 20', 20'', 20''', 20'''), (21, 21', 21'') can slide with respect to one of the folding elements (1), (1'), (19).
3. An item of transformable furniture, according to claim 2, where the said folding elements (1), (1'), (19) are formed as frames.
4. An item of transformable furniture, according to claim 3, where the said folding elements (1), (1'), (19) are formed as U-shaped tubular frames, where the middle parts of two of the said frames (1), (19) form the said first and second horizontal axes (2), (3), while the legs of these frames are joined by said sliding hinge joints (20, 20', 20'', 20'''), (21).
5. An item of transformable furniture, according to claim 3, where the legs of element 1 are joined so as to form a closed quadrangular frame, and there is a locking mechanism at the couple of sliding hinge joint (20, 20', 20'', 20'''), (21).
6. An item of transformable furniture, according to one of claims 1 to 5, where the plate serving as back (18) or worktop (18) is joined to one of the said interconnected folding elements (1) so that when said elements are folded the worktop (18) is deformable depending on its concrete position from a substantially bent form as back (18) to a substantially flat form as worktop (18) and vice versa.

7. An item of transformable furniture, according to claim 6, where the said first axis (2) is in the form of an elongated, preferably cylindrical element with a bent section (2a), lying in a horizontal plane, and said first plate, made of a flexible flat element (18) is attached to this section so that it can rotate, so that in the position of worktop said bent section (2a) serves as three-point support, supporting the worktop in a plane, while in the position of back said bent section pulls the flexible element (18) that touches the ends of element (2), shaping it so that the flexible element (18) takes a concave shape, following the shape of said bent section.
8. An item of transformable furniture, according to one of claims 1 to 7, which in addition contains a locking device to fix in the respective relative position at least two of said three interconnected folding elements (1), (1'), (19).
9. An item of transformable furniture, according to claim 8, where at least one of the said axes (2), (3) is attached to the respective plate so that it can slide and move the position of the point of rotation of said plate with respect to said axis, where said position can be fixed by means of another locking device.
10. An item of transformable furniture, which comprises a first plate (5) and a second plate (6), linked to each other by a hinge joint (4), where said two plates (5), (6) can rotate respectively round first and second horizontal axes (2), (3) so that the plates (5), (6) can be moved from a first position as seat (17) and back (18), respectively, to a second position as front panel (17) and worktop (18), respectively, where the first plate, serving as back and worktop, is deformable depending on its concrete position from a substantially concave form as back to a substantially flat form as worktop and vice versa.
11. An item of transformable furniture, according to claim 10, where the said first axis (2) is in the form of an elongated, preferably cylindrical element with a bent section (2a), lying in a horizontal plane, and said first plate, made of a flexible flat element (18) is attached to this section so that it can rotate, so that in the position of worktop said bent section (2a) serves as three-point support, supporting the worktop in a plane, while in the position of back said bent section pulls the flexible element (18) that touches the ends of element (2), shaping it so that the flexible element (18) takes a concave shape, following the shape of said bent section.

12. An item of transformable furniture, according to claim 11, where the said first plate has inhomogeneous (irregular) ability of deformation.
13. An item of transformable furniture, according to claim 2, characterized in that the couple of joints (20, 20', 20'', 20''') is capable of rotation and translation, while the couple of joints (20''''') is capable of rotation only and the couple of joints (21, 21', 21'') is capable of rotation or translation, and vice versa.
14. An item of transformable furniture, according to claim 8, characterized in that the fixing device is a locking mechanism consisting of a slot, locking element and spring or a T-shaped slipping bush, peg, spring and button.
15. An item of transformable furniture, according to claim 13, characterized in that the couple of slots (7) are formed longitudinally in the long sides of one of the frames (1), (1'), (19), where at one end the slots end in a circular opening, while at the opposite end they end in a curve, formed as an arc-shaped cutout providing for bayonet locking / respectively unlocking of the supporting construction (1), (1'), (19) in unfolded / respectively folded position.
16. An item of transformable furniture, according to claim 13, characterized in that the couple of T-shaped slipping bushes are located at the long sides of one of the frames (1), (1'), (19) and can move along the long sides of the respective frame (1), (1'), (19) and together with the peg, spring and button provide locking / respectively unlocking of the supporting construction (1), (1'), (19) in unfolded / respectively folded position.
17. An item of transformable furniture, which comprises a seat (17) and a back (18), connected by a hinge joint (4), where said seat (17) and back (18) can rotate respectively round first horizontal axis (2) and second horizontal axis (3) so that the seat (17) and back (18) can be moved from a first position as seat (17) and back (18), respectively, to a second position as front panel (17) and worktop (18), respectively, and vice versa, where the said seat (17) and back (18) are attached by means of said first and second horizontal axes (2), (3) to a supporting construction that consists of at least three interconnected folding elements (1), (1'), (19), where at least two of the folding elements are connected by hinge joints (16'), (16'') with a coupling element (30).

18. An item of transformable furniture, according to claim 17, characterized in that the coupling element (30) is a plate, which is fixed at the upper end of the folding elements (1), (1') by hinge joints (16''), (16').

19. An item of transformable furniture, according to claim 17, characterized in that the plate (30) can rotate up to 180° round the respective hinge joint (16'').