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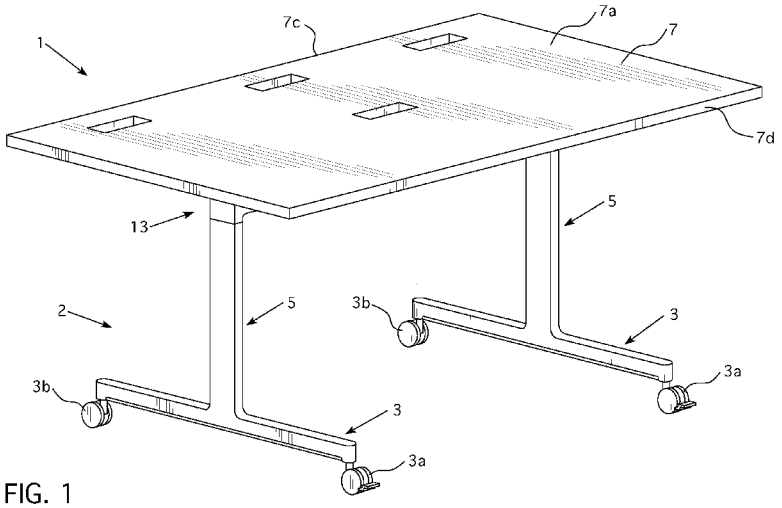

FIG. 1

(57) Abstract: An article of furniture (1) includes a structure having a surface (7) that supports a weight. The surface may be tiltable from a first position in which the surface is flat or substantially horizontal and a second position in which the surface is substantially vertical. At least one leg (5) rotating mechanism (13) may attach at least one leg of the article of furniture to the surface so that the at least one leg is rotatable about a vertical axis when the surface is tilted. In some embodiments, the article may be a table and the surface may be a tabletop. In other embodiments, the article may be a chair and the surface may be a seating surface of a seat.

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ARTICLE OF FURNITURE AND METHOD OF STACKING THE SAME

CROSS-REFERENCE TO RELATED APPLICATIONS

The present application claims priority to U.S. Patent Application No. 14/522,047, which was filed on October 23, 2014, and U.S. Provisional Patent Application No. 61/896,248, which was filed on October 28, 2013.

FIELD OF THE INVENTION

The present invention relates to articles of furniture such as tables or chairs and methods of making and using articles of furniture.

BACKGROUND OF THE INVENTION

Tables and other articles of furniture are often configured to have a number of legs that support a surface. For instance, tables may have legs or a stand that supports a tabletop. As another example, a chair may have a pedestal base or legs that support a seat. Examples of such articles of furniture may be appreciated from U.S. Pat. Nos. D686,856, 1,240,390, 2,796,307, 2,903,312, 3,166,029, 3,382,820, 3,408,965, 6,389,988, 6,550,402, 7,066,098, 7,765,938, 7,845,290, 8,091,488, 8,342,462, 8,347,796, 8,505,186, and U.S. Pat. App. Pub. Nos. 2010/0044541, 2011/0304183, 2012/0304902, 2012/0306240, and 2013/0118387.

Tables, chairs and other furniture may be nested, or stacked when stored to preserve space. For instance, chairs may be configured to be stacked on top of each other. As another example, tables may be configured to be stacked on top of each other or nested beside other tables.

We have determined that a new arrangement for an article of furniture is needed to improve the ability of furniture to be easily nested, or stacked.

SUMMARY OF THE INVENTION

An article of furniture is provided. The article of furniture may include a first structure having a first surface and a second surface opposite the first surface where the first and second surfaces extend from a first edge of the first structure to a second edge of the first structure that is opposite the first edge of the first structure. The article may also include a first tilting mechanism attached to the first structure that is sized and configured such that the first structure is rotatable from a first position to a second position. The first edge of the first structure may be at a first elevation when the first structure is in the first position and the first edge of the first structure may be at a second elevation that is higher than the first elevation when the first structure is in the second position. A first leg may also be included in the article. The first leg can be movable from a first position to a second position. A first leg rotating mechanism may be attached between the first leg and the first tilting mechanism. The first leg rotating mechanism may rotate the first leg from the first position of the first leg to the second position of the first leg when the first structure is rotated from the first position of the first structure to the second position of the first structure.

In some embodiments, the article of furniture may be a table such as a work table, a dining table, an end table, a side table, or a moveable table that may have a tabletop that is useable for numerous different activities such as work related activities, eating, or other activities. In other embodiments, it is contemplated that the article of furniture may be a chair.

In some embodiments, the article of furniture may be configured as a table and the first structure may be a tabletop and the first surface may be a flat surface or is a substantially flat surface and the second surface may be a flat surface or a substantially flat surface. A substantially flat surface may be a surface that has a slight inclination or declination (e.g.

between 1-3 degree of declination or inclination) or a slight variance between intermediate portions of the surface.

The article of furniture may also include a second leg that is movable from a first position to a second position and a second tilting mechanism attached to the first structure. The second tilting mechanism may be sized and configured such that the first structure is rotatable from the first position to the second position. The second leg rotating mechanism may be attached between the second leg and the second tilting mechanism. The second leg rotating mechanism can rotate the second leg from the first position of the second leg to the second position of the second leg when the first structure is rotated from the first position of the first structure to the second position of the first structure. The article may also include at least one first foot connected to the first leg and at least one second foot connected to the second leg.

In some embodiments of the article of furniture, the first tilting mechanism may comprise a first carriage positioned between the first leg and the first tilting mechanism. The first carriage can be connected to the first structure such that the first structure is rotatable about a horizontal axis from the first position of the first structure to the second position of the first structure. The first leg rotating mechanism may comprise a first member, a first arm, and a first leg connecting body connecting the first leg rotating mechanism to the first leg. The first member may have a first end connected to a portion of the first tilting mechanism and a second end attached to the first arm. The first end of the first member can be connected to the first tilting mechanism such that the first member moves when the first structure is moved from the first position of the first structure to the second position of the first structure. The movement of the first member can cause the first arm to move to drive rotation of the first leg connecting body so that the first leg is rotated and the at least one first foot is rotated from a first position to a second position. The

second tilting mechanism may include a second carriage positioned between the second leg and the second tilting mechanism. The second carriage may be connected to the first structure such that the first structure is rotatable about the horizontal axis from the first position of the first structure to the second position of the first structure. The second leg rotating mechanism may comprise a second member, a second arm, and a second leg connecting body connecting the second leg rotating mechanism to the second leg. The second member may have a first end connected to a portion of the second tilting mechanism and a second end attached to the second arm. The first end of the second member can be connected to the second tilting mechanism such that the second member moves when the first structure is moved from the first position of the first structure to the second position of the first structure. The movement of the second member can cause the second arm to move to drive rotation of the second leg connecting body so that the second leg is rotated and the at least one second foot is rotated from a first position to a second position.

The first member of the first leg rotating mechanism may have a number of configurations. For instance, the first member may be a generally L-shaped member, a generally C-shaped member, a generally U-shaped member or a generally V-shaped member. The second member of the second leg rotating mechanism may also have a number of different configurations. For example, the second member may be a generally L-shaped member, a generally C-shaped member, a generally U-shaped member or a generally V-shaped member.

In some embodiments, the first tilting mechanism may be comprised of a first connector member and a first shaft connected to the first connector member. The first shaft may also be connected to the first carriage such that the first connector member is rotatable about the first shaft. The second tilting mechanism may be comprised of a second connector member and a

second shaft connected to the second connector member. The second shaft can also be connected to the second carriage such that the second connector member is rotatable about the second shaft. The first connector member may be attached to the first surface of the first structure and the second connector member may be attached to the first surface of the first structure. The first and second connector members may connect the first structure to the first and second tilting mechanisms to permit the first structure to be rotated from the first position of the first structure to the second position of the first structure. The first and second shafts can define an axis about which the first structure is rotatable. In some embodiments, the first member of the first leg rotating mechanism can extend from adjacent the first connector member to adjacent the first arm and the second member of the second leg rotating mechanism may extend from adjacent the second connector member to adjacent the second arm.

A cross member may extend between the first leg and the second leg in some embodiments of the article of furniture. The first arm may be positioned within a first end of the cross member and the second arm may be positioned within a second end of the cross member that is opposite the first end of the cross member. The first carriage can be attached to the cross member such that the first arm is below the first carriage and the second carriage may be attached to the cross member such that the second arm is below the second carriage.

In some embodiments of the article of furniture, the first leg rotating mechanism can also be comprised of a first pin attached to a distal end of the first arm and a first element extending from the first pin to the second end of the first member and the second leg rotating mechanism is also comprised of a second pin attached to a distal end of the second arm and a second element extending from the second pin to the second end of the second member. For example, the first pin can be rotatably connected to the distal end of the first arm and the second pin may be

rotatably connected to the distal end of the second arm. As another example, the first element can be slideably connected to the first pin and to the second end of the first member and the second element can be slideably connected to the second pin and the second end of the second member.

The first and second leg rotating mechanisms may also be configured to include other elements in some embodiments of the article of furniture. For example, the first leg rotating mechanism may also be comprised of a first axle extending through a portion of the first arm. The first arm may be rotatable about the first axle such that movement of the distal end of the first arm causes rotation of the first arm about the first axle and drives rotation of the first leg connecting body. The second leg rotating mechanism may also be comprised of a second axle extending through a portion of the second arm. The second arm can be rotatable about the second axle such that the movement of the distal end of the second arm causes rotation of the second arm about the second axle and drives rotation of the second leg connecting body.

It should be appreciated that the at least one first foot can be comprised of only one foot or of multiple feet. For instance, the at least one first foot may include a first front foot and a first rear foot and the at least one second foot may include a second rear foot and a second front foot. The first front foot may be in the second position of the first front foot and the second front foot can be in the second position of the second front foot and the first and second front feet may be farther apart as compared to when the first front foot is in the first position of the first front foot and the second front foot is in the first position of the second front foot. When the first rear foot is in the second position of the first rear foot and the second rear foot is in the second position of the second rear foot, the first and second rear feet may be closer together as compared to when the first rear foot is in the first position of the first rear foot and the second rear foot is in

the first position of the second rear foot. The first front foot may be a caster, the second front foot may be a caster, the third front foot may be a caster and the fourth front foot may be a caster. Alternatively, the first, second, third and fourth feet may each be a non-moving stud or ground contacting structure that is not rollable along a floor.

An article of furniture is also provided that includes a tabletop having a first surface and a second surface opposite the first surface, The first and second surfaces extend from a first edge of the tabletop to a second edge of the tabletop that is opposite the first edge of the tabletop. A first tilting mechanism is attached to the tabletop. The first tilting mechanism is sized and configured such that the first tabletop is rotatable from a first position to a second position. The first edge of the tabletop is at a first elevation when the tabletop is in the first position and the second edge of the tabletop is at a second elevation when the tabletop is in the second position. The second elevation is higher than the first elevation. A first leg can be attached to the first tilting mechanism via a first leg rotating mechanism attached between the first leg and the first titling mechanism. The first leg rotating mechanism can be attached between the first leg and the first tilting mechanism such that the first leg is moveable from a first position to a second position when the tabletop is moved from the first position of the tabletop to the second position of the tabletop. A second leg is movable from a first position to a second position. A second tilting mechanism is attached to the tabletop. The second tilting mechanism is sized and configured such that the tabletop is rotatable from the first position to the second position. A second leg rotating mechanism is attached between the second leg and the second tilting mechanism. The second leg rotating mechanism is configured to rotate the second leg from the first position of the second leg to the second position of the second leg when the tabletop is rotated from the first position of the first structure to the second position of the first structure.

The first tilting mechanism can include a first carriage positioned between the first leg and the first tilting mechanism, a first connector member attached to the first surface of the tabletop and rotatably connected to the first carriage, and a first shaft attached to the first connector member. The second tilting mechanism can include a second carriage positioned between the second leg and the second tilting mechanism, a second connector member attached to the first surface of the tabletop and rotatably connected to the second carriage, and a second shaft attached to the second connector member. The first leg rotating mechanism can include a first member having a first end connected to the first shaft and a second end opposite the first end of the first member, a first arm, a first pin rotatably attached to a distal end of the first arm, a first element extending from the first pin to within the second end of the first member such that the first element is moveably positionable within the second end of the first member, and a first leg connecting body connecting the first arm to the first leg, and a first axle extending through a portion of the first arm. The first arm can be rotatable about the first axle such that movement of the distal end of the first arm causes rotation of the first arm about the first axle and causes movement of the first leg connecting body to rotate the first leg from the first position of the first leg to the second position of the first leg. The second leg rotating mechanism can include a second member having a first end connected to the second shaft and a second end opposite the first end of the second member, a second arm, a second pin rotatably attached to a distal end of the second arm, a second element extending from the second pin to within the second end of the second member such that the second element is moveably positionable within the second end of the second member, and a second leg connecting body connecting the second arm to the second leg, and a second axle extending through a portion of the second arm. The second arm can be rotatable about the second axle such that movement of the distal end of the second arm causes

rotation of the second arm about the second axle and causes rotation of the second leg connecting body to rotate the second leg from the first position of the second leg to the second position of the second leg. The first and second shafts can define an axis about which the tabletop is rotatable when the tabletop moves from the first position to the second position. The first end of the first member of the first leg rotation mechanism can rotate during movement of the tabletop from the first position of the tabletop to the second position of the tabletop such that rotation of the first end of the first member causes the first element to move within the second end of the first member and causes the first pin to rotate relating to the distal end of the first arm and also causes the first pin to move to drive rotation of the first arm about the first axle such that the first leg connecting body moves to rotate the first leg from the first position of the first leg to the second position of the first leg. The first end of the second member of the second leg rotation mechanism can rotate during movement of the tabletop from the first position of the tabletop to the second position of the tabletop. Rotation of the first end of the second member can cause the second element to move within the second end of the second member and cause the second pin to rotate relating to the distal end of the second arm and also cause the second pin to move to drive rotation of the second arm about the second axle such that the second leg connecting body moves to rotate the second leg from the first position of the second leg to the second position of the second leg.

A cross member may extend between the first leg and the second leg. The first arm can be positioned within a first end of the cross member and the second arm can be positioned within a second end of the cross member that is opposite the first end of the cross member. The first carriage can be attached to the cross member such that the first arm is below the first carriage

and the second carriage can be attached to the cross member such that the second arm is below the second carriage.

Embodiments of the article of furniture can include a first front foot and a first rear foot connected to the first leg and a second front foot and a second rear foot connected to the second leg. The first front foot and the second front foot can be moved away from each other when the first and second legs are moved from their first positions to their second positions. The first rear foot and the second rear foot can be moved to be closer to each other when the first and second legs are moved from their first positions to their second positions.

In some embodiments, the first member of the first leg rotating mechanism also has an intermediate member extending between the first and second ends of the first member of the first leg rotating mechanism such that the first member is a generally L-shaped member, a generally C-shaped member, a generally U-shaped member or a generally V-shaped member. The second member of the second leg rotating mechanism can have an intermediate member extending between the first and second ends of the second member of the second leg rotating mechanism such that the second member is a is a generally L-shaped member, a generally C-shaped member, a generally U-shaped member or a generally V-shaped member.

In some embodiments, the first element is a rod, a pin, a linearly extending member, or a shaft and the second element is a rod, a pin, a linearly extending member, or a shaft. Additionally, the first shaft can be a rod or other type of linearly extending member and the second shaft can be a rod or other type of linearly extending member.

A method of stacking tables is also provided. The method may include providing a plurality of tables. Each of the tables may be an article of furniture as mentioned above or discussed more fully herein. The method may also include the step of moving the first structure

of each of the tables from the first position to the second position so that the first leg is also moved from the first position of the first leg to the second position of the first leg. The tables may then be nested adjacent to each other to stack the tables.

Other details, objects, and advantages of the invention will become apparent as the following description of certain exemplary embodiments thereof and certain exemplary methods of practicing the same proceeds.

BRIEF DESCRIPTION OF THE DRAWINGS

Exemplary embodiments of an article of furniture are shown in the accompanying drawings and certain exemplary methods of practicing the same are also illustrated therein. It should be appreciated that like reference numbers used in the drawings may identify like components.

Figure 1 is a perspective view of a first exemplary embodiment of an article of furniture, in a first position in a surface of the tabletop is substantially flat or substantially horizontal and legs of the article are in a first position.

Figure 2 is a side view of the first exemplary embodiment of the article of furniture in the first position.

Figure 3 is a top view of the first exemplary embodiment of the article of furniture in a second position in which the tabletop is tilted to be substantially vertical and the legs of the article are in a second position so that front feet are farther apart from each other as compared to the space between the rear feet.

Figure 4 is a perspective view of the first exemplary embodiment of the article of furniture in the second position.

Figure 5 is a side view of the first exemplary embodiment of the article of furniture in the second position.

Figure 6 is a rear view of the first exemplary embodiment of the article of furniture in the second position.

Figure 7 is a rear perspective view of the first exemplary embodiment of the article of furniture in the second position.

Figure 8 is a bottom perspective view of the first exemplary embodiment of the article of furniture in the first position.

Figure 9 is a bottom view of the first exemplary embodiment of the article of furniture in the first position.

Figure 10 is a bottom view of the first exemplary embodiment of the article of furniture in the second position.

Figure 11 is a fragmentary view of the first exemplary embodiment of the article of furniture that has portions of a leg rotating mechanism and cross member cut away to illustrate portions of the leg rotating mechanism, tabletop tilting mechanism, and latch mechanism of the first exemplary embodiment of the article of furniture while the article of furniture is in the second position.

Figure 12 is a bottom fragmentary view of the first exemplary embodiment of the article of furniture in the second position that has portions of the leg rotating mechanism, tabletop tilting mechanism, and latch mechanism of the first exemplary embodiment of the article of furniture shown in phantom view to illustrate components of these elements.

Figure 13 is a perspective view of a stacked set of the first exemplary embodiments of the article of furniture in their second positions being nested together for stowing of the articles of furniture.

DETAILED DESCRIPTION OF EXEMPLARY EMBODIMENTS

An article of furniture 1 may be configured as a table. The table may include a base 2 that has feet 3 attached to respective legs 5. Each of the legs 5 may extend vertically from the one or more feet 3 to which the leg 5 is attached to adjacent a bottom surface of a tabletop 7. The legs 5 may be members that are composed of metal, a polymeric material, a composite material, wood, or a combination of such elements. Each leg 5 may be attached to a connecting structure, such as a feet supporting member or bracket that connects one or more feet 3 to that leg 5. The feet 3 may include front feet 3a and rear feet 3b. In some embodiments, the front feet 3a can be configured as first feet of first and second sides of the article of furniture that are adjacent a front side of the table and the rear feet 3b can be considered second feet of the first and second sides of the article that are adjacent a rear side of the table.

The feet 3 may include casters or floor contacting elements. For instance, the feet 3 may each be casters or wheels so that the articles are easily rollable along a floor or other surface for stowing the articles and subsequently moving the articles into a room and placing the articles into their first position for use in meetings or for use in a particular project or a particular work environment.

When the article of furniture is in a first position, the upper surface 7a of the tabletop 7 may be flat or substantially flat. For example, a first edge 7c of the tabletop may be at a same height as a second edge 7d of the tabletop 7. An opposite bottom surface 7b may also be flat or substantially flat. As another example, the upper and bottom surfaces 7a and 7b may be positioned to define a horizontal or substantially horizontal (e.g. a surface having a 1-5 degree angle of declination or inclination) surface when the article of furniture is in the first position. When the article of furniture is moved to a second position, the tabletop 7 may be tilted so that the upper surface extends from the first edge 7c to the second edge 7d substantially vertically

(e.g. is at an angle of 45 degrees or greater relative to horizontal, at an angle of 70 degrees relative to horizontal, at an angle of between 85-90 degrees relative to horizontal, etc.) or is more steeply inclined or declined relative to the angle of inclination or declination of the upper surface 7a of the tabletop 7 when the tabletop 7 is in the first position. When the article of furniture 1 is in the second position, the second edge 7d may therefore be at a higher elevation than the first edge 7c.

It should be appreciated that the difference in elevation between the first and second edges 7c and 7d of the tabletop 7 may be substantially greater when the article of furniture 1 is in the second position as compared to when it is in the first position. For instance, when in the first position, the first and second edges 7c and 7d may be at the same height or about the same height so that a difference in their elevations is zero or about zero. In contrast, when the article of furniture is in the second position, the height of the second edge 7d may be substantially greater than the height of the first edge 7c (e.g. 20 or more centimeters, 30 or more centimeters, at least one meter, 2 or more meters, between 20 centimeters and 2 meters, etc.

When the article of furniture 1 is moved from the first position to the second position the tabletop 7 is moved from a first position to a second position as noted above, shown in the drawings, and discussed further below. At the same time, legs 5 and feet 3 of the base are also moved from a first position to a second position. In the first position of the legs 5 and feet 3, the feet may be a same distance apart from each other. For instance, forward feet 3a may be separated from each other by a space S1 and rear feet 3b may be separated from each other by a space S2 when the article is in the first position and the legs 5 and feet 3 are in the first position. The distance of space S1 may be equal to the distance of space S2 or about equal to each other (e.g. within 2.5 centimeters and 9 centimeters of each other). When the article is in the second

position and the legs 5 and feet 3 are in the second position, the front feet 3a may be separated from each other by a space S3 that is greater than the distance of space S1 and the rear feet 3b may be separated from each other by a space S4 that is narrower than the distance of space S2 such that the front feet 3a are closer to each other when in the first position as compared to the second position and the rear feet 3b are closer to each other when in the second position as compared to the first position. It is also contemplated that alternative embodiments of the article of furniture 1 may be configured so that the legs 5 and feet 3 are moved from the first position into the second position so that the rear feet 3b are spaced so that they are closer together when in the second position as compared to the first position and that the front feet 3a are spaced farther apart when in the second position as compared to the first position.

The article of furniture 1 may be configured to utilize an adjustment mechanism for actuating movement of the tabletop 7, legs 5 and feet 3 between the first and second positions so that the tabletop, legs 5, and feet 3 may be moved from their first position to their second position and subsequently moved from their second position to their first position. The adjustment mechanism may include at least one leg rotating mechanism 13 for rotating or twisting of the legs 5 and feet 3, at least one tilting mechanism 14 for tilting of the tabletop 7, and at least one latch mechanism 15 for releaseably locking the tabletop 7 in the first position to prevent accidental movement of the tabletop 7, legs 5, and feet 3 from their first position to their second position.

The latch mechanism 15 may include a slidable handle or moveable handle member that is biased to a locked position by one or more spring elements such as coil springs or elastomeric spring bodies that engage the handle and bias the handle to the locked position. A user may press on the handle or otherwise act on the handle to move the handle to an unlocked position by

causing the handle to move against the direction of biasing force applied by the one or more spring elements. When the handle is moved to the unlocked position, the tabletop 7 is unlatched from the base 2 of the table and is tiltable from the first position to the second position. For instance, movement of the handle may cause a projection, or lockable member to slide out of contact or locked engagement with a latching member 15a that may define an opening for receiving and releaseably locking with the projection or lockable member so that the tabletop 7 is tiltable.

The tilting mechanism 14 may include multiple connector members 11 that are attached to the bottom surface 7b of the tabletop 7 and are releaseably attachable to a cross member 9 of the base 2 of the article of furniture 1 via the latching mechanism 15. Each connector member 11 may be connected to a latch mechanism 15 so that multiple latch mechanisms must be moved to the unlocked position to release the connector members 11 from the cross member 9. Alternatively, only one connector member 11 may have a latch mechanism that locks and unlocks the connector member 11 from the cross member to permit tilting of the tabletop 7. The latch mechanism attached to the connector member 11 may be an element that releaseably connects the connector member 11 to the cross member 9. Each connector member 11 or only one connector member 11 may therefore be releaseably connected to the cross member 9 in embodiments of the article of furniture 1.

Each connector member 11 may be a rectangular structure, a beam, a bar, a rod, or other structure that extends under a portion of the bottom surface 7b of the tabletop or is attached to the bottom surface 7b of the tabletop. Each connector member 11 attached to a latch mechanism 15 may define a channel or opening for housing the slidable handle of the latch mechanism. The one or more biasing spring elements of the latch mechanism can also be housed within the

connector member 11 and be moveable (e.g. slideable) within the connector member to move in response to a user providing a force to move the slideable handle that may include a member that is coupled to the at least one biasing spring elements (e.g. coil springs). An interlockable element that is connected to the moveable handle and is configured to be moved from a locked position and an unlocked position from latch member 15a may also be housed within the connector member 11 and may be moveable within the connector member 11 from a locked position in which it contacts or otherwise engages the latch member 15a and a second position in which it is away from the latch member 15a or out of engagement with the latch member 15a to permit rotation of the connector member 11 relative to the cross member 9 about a rotational axis. The latch member 15a may be an integral component of a carriage 10 that is attached to the cross member 9 or may be a latch member 15a that is attached to a carriage 10 attached to the cross member 9 via one or more fasteners such as screws, bolts, another type of fastening mechanism such as one or more welded joints, or a combination of such fastening mechanisms.

The tilting mechanisms 14 may be configured to permit the tabletop 7 to rotate about a horizontal axis so that the tabletop 7 is vertically tiltable and moveable relative to the cross member 9. Each tilting mechanism 14 may be attached between the connector member 11 and the cross member 9 to connect the connector member 11 to the cross member 9. Each connector member 11 may be attached to a respective tilting mechanism 14. Alternatively, one tilting mechanism 14 may be attached to all the connector members 11 to moveably connect the connector members 11 to the cross member 9.

As may best be appreciated from Figures 11-12, each tilting mechanism 14 may include a shaft 18 that extends through holes in the connector member 11 and also extends through holes in a portion of the carriage 10 attached to the cross member 9. The shaft 18 may be a pin, rod,

beam, member, or other element that defines a horizontal axle about which the connector member 11 can be rotatable when the latch mechanism 15 is moved to the unlocked position so that the connector member 11 is moveable about the shaft 18 in a first direction and an opposite second direction as indicated by arrow A. In some embodiments, the shaft 18 may rotate when the connector member 11 is rotated about the axle defined by the shaft. In some embodiments, a dampener 51 (e.g. a gas spring, a hydraulic spring, or other dampener element), which is shown in broken line in Figure 11, can be attached between the carriage 10 and the connector member 11. The dampener 51 can be configured to help regulate the speed at which the table top 7 may rotate when the connector member 11 is rotated about the shaft 18. In some other embodiments, the dampener 51 may be attached between the carriage 10 and the table top 7, the cross member 9 and the table top 7, or the cross member 9 and the connector member 11, instead of (or in addition to) a dampener 51 being attached between the carriage 10 and the connector member 11.

Each leg rotating mechanism 13 may be attached between a respective leg 5 and a connector member 11 or tilting mechanism 14 so that rotation of the tabletop 7 from its first position to its second position also results in rotation of the legs 5 and feet 3 from their first position to their second position. For example, embodiments of the article of furniture 1 may include two legs 5 adjacent opposite sides of a tabletop 7 and include two leg rotating mechanisms 13, a first leg rotating mechanism attached to a first leg and a second leg rotating mechanism attached to the second leg opposite the first leg. In some embodiments, each leg rotating mechanism may be attached to a respective connector member 11 for attachment to a respective component of a tilting mechanism 14. In other embodiments, multiple leg rotating mechanisms 13 may be attached to opposite ends of the same cross member 9 for attachment to the same component of a tilting mechanism 14.

Each leg rotating mechanism 13 may include a first rod 20 that is positioned within a connector member 11 or is attached to the connector member 11. The first rod 20 may be a rod, pin, or other type of linearly extending elongated member (e.g. a shaft). A first end 21a of a curved L-shaped member 21 may be attached to the first rod 20 and may be rotatably attached so that it can rotate about the first rod 20 or may be immovably affixed to the first rod 20. When rotatably attached to the first rod 20, the first end 21a of the L-shaped member 21 may be rotatable about the first rod 20 in two opposite directions as indicated by arrow G. The L-shaped member is considered to be L-shaped because it is generally L-shaped as it has a curved "L" type shape. The L-shaped member could alternatively be configured as a generally V-shaped member, a generally U-shaped member, a generally C-shaped member, or other curved member or polygonal member. The L-shaped member 21 may be immovably affixed or rotatably attached to the first rod 20, which may be attached to and positioned within the connector member 11. The L-shaped member 21 extends from its first end 21a to its second end 21b. An intermediate portion 21c of the L-shaped member 21 that is between the first and second ends 21a and 21b passes through an opening in the cross member 9. The second end 21b of the L-shaped member 21 is positioned within the cross member 9 and is attached to a second rod 22. The second rod 22 may be a rod, pin, or other type of linearly extending elongated element (e.g. a shaft) that extends from the second end 21b of the L-shaped member to a pin 23. The second rod may be rotatably attached to the second end 21b of the L-shaped member 21 so that the second end 21b is rotatable about the second rod 22. For example, the second end 21b may be rotatable about the second rod 22 in two different opposite directions as indicated by arrow B in Figure 11. The second rod 22 may therefore function as an axle along which the second end 21b of the L-shaped member 21 is rotatable.

A first end portion of the second rod 22 may be positioned within an opening formed in the second end 21b of the L-shaped member 21. The second rod 22 may be positioned through the opening of the second end 21b of the L-shaped member through which the second rod 22 extends. The second rod 22 may be slideable through this opening of the second end 21b of the L-shaped member 21. It is contemplated that the terminal end of the first end portion of the second rod 22 may have a head or oversized dimension that is able to prevent the first end from sliding out of the opening of the second end 21b of the L-shaped member. The second rod may be slideable in two opposite directions as indicated by arrow E in Figures 11-12. A second end portion of the second rod 22 that is opposite the second rod's first end portion may extend through an opening formed in a pin 23. The second end portion of the second rod 22 may be immovably affixed to the pin 23 in some embodiments of the article of furniture.

The pin 23 is attached to a rotatable arm 25 that extends from the leg 5. For example, the arm 25 can extend from a leg connecting body 24 that is attached to the leg 5 between the leg 5 and the arm 25. Alternatively, the arm 25 can extend directly from the leg 5 and may have an end that is directly attached to the leg 5. The pin 23 may be rotationally attached to a distal end of the arm 25 so that the pin is rotatable in two opposite directions as indicated by arrow F while being attached to the arm 25. The arm 25 can be rotationally attached to a bottom portion of the pin 23 and the upper portion of the pin 23 defines the opening for receiving the second end of the second pin 22. The arm 25 is attached to the pin 23 so that forward and rearward movement of the second end 21b of the L-shaped member 21 as indicated by arrow C in Figure 1 also causes the distal end of arm 25 to move forwardly and rearwardly and drives rotational movement of the arm about a cylindrical element 27 attached to the cross member 9 as indicated by arrow D. During the rotational movement of the arm 25, the pin 23 may rotate as indicated by arrow F and

a portion of the second rod 22 may slide through the opening of the second end 21b of the L-shaped member as indicated by arrow E.

The arm 25 is positioned within the cross member 9 so that the arm 25 is moveable within the cross member 9. The arm 25 has a passageway defined therein through which a generally cylindrical element 27 passes. The cylindrical element 27 may define a vertical axle about which the arm 25 is rotatable in two opposite directions as indicated by arrow D in Figure 11. A proximal end of the arm 25 is attached to a leg connecting body 24 that is attached to an upper portion of the leg 5 so that the leg connecting body 24 and leg 5 to which it is attached rotate in the same direction that the arm 25 is rotated when the arm 25 is rotated about the axle defined by the cylindrical element 27.

The arm 25 may be integrally connected to the leg 5 via welding or by being a cast structure that defines both the arm 25 and leg connecting body 24. Alternatively, the arm 25 may be fastened to the leg connecting body 24 via one or more fasteners or fastening mechanisms such as bolts and screws, or a combination of welding and fasteners. The leg connecting body 24 may be attached to the upper end of the leg 5 via one or more fasteners. Alternatively, the leg connecting body 24 may be integral with the upper end of the leg 5 by being formed on the upper end of the leg when the leg is molded or cast or being welded or bonded onto the upper end of the leg 5.

It should be appreciated that each leg 5 may be attached to a respective leg rotating mechanism 13. Each respective leg rotating mechanism 13 may be attached to a respective connector member 11 and be attached to or positioned in a respective end or side of the cross member 9. Alternatively each leg rotating mechanism 13 may be attached to the same connector member 11.

The cross member 9 may be a polygonal shaped bar or beam, or may be sized and configured as a rod or other structure. The cross member 9 may extend between two opposing legs 5 below the bottom surface 7b of the tabletop 7 when the tabletop 7 is in the first position. An upper channel may be defined within the cross member for receiving one or more carriages 10 and also for providing a conduit for wire management (e.g. power cables for electronic devices, Ethernet cabling, other cabling, etc.) Each end of the cross member may be configured to retain or receive a respective carriage 10 for attachment of the cross member 9 to a respective connector member 11. Each carriage 10 may be configured to interlock with a top profile defined on the upper portion of the cross member. In addition, or as an alternative, the carriage may be fastened to the cross member by one or more fasteners or fastening mechanisms such as bolts, screws, welding, or a combination of such fastening mechanisms. Each end of the cross member may also have a lower space, lower area, lower compartment, or a portion of a lower channel that is below the upper channel that has an open volume that is sized and shaped to receive a portion of the cylindrical element 27, the second end 21b of the L-shaped member 21, the second rod 22, the pin 23, and the arm 25.

Embodiments of the article of furniture are configured so that lifting of the tabletop 7 from its first position to its second position automatically also adjusts the legs 5 and feet 3 to their second position so that the article is configured for stowing the table in a nested arrangement with multiple other articles all positioned in the same arrangement as shown, for example, in Figure 13. Such a configuration can permit the articles of furniture to all be placed into the second position and stowed or otherwise stacked in a nested, compact arrangement so that floor space may be economically used for storing of the articles. When needed for a project or work function, the articles may then be removed from their stacked, nested arrangement,

moved to a desired position, and adjusted from the second position to their first position. It should be appreciated that the stacking of the tables for such embodiments can be a horizontal stacking of the nested tables.

For instance, lifting of the tabletop from its first position to its second position may cause the cross members 11 to rotate about shafts 18 and also cause the first ends 21a of the L-shaped members connected to first rods 20 to rotate or otherwise move so that the second ends 21b of the L-shaped members 21 move forwardly within the cross member 9, which drives forward movement of the distal ends of the arms 25 so that the arms 25 rotate about the cylindrical elements 27 and cause rotation, or twisting, of the leg connecting bodies 24 and legs 5 to which those bodies are attached. Each arm 25 is driven by the forward motion of the L-shaped member 21 to which it is connected via the second rods 22 and pins 23 connecting that arm 25 to the L-shaped member 21. During forward movement of the L-shaped members, the second rods 22 attached to the L-shaped members 21 slide through the opening in the second ends 21b of the L-shaped members toward the arms 25 and the pins 23 rotates as the L-shaped members are moved forwardly and the second rods 22 slide. The rotation of the pins 23 and sliding and forward movement of the second rods 22 and forward movement of the L-shaped members 21 cooperate to drive rotation of the arms 25. Each of the pins 23 of the leg rotating mechanisms 13 may rotate counterclockwise when the L-shaped member to which they are connected is moved forwardly and each of the second rods 22 may be slid toward the pin 23 to which that second rod 22 is attached. In other embodiments, the pin 23 may be configured to rotate in a clockwise direction when the L-shaped member to which it is attached is moved forwardly.

Rotation or twisting of the legs 5 caused via tilting of the tabletop 7 from its first position to its second position causes the feet 3 to move so that the front feet 3a move away from each

other and the rear feat 3b move closer to each other. When the tabletop 7 is tilted from its second position to its first position, the cross members 11 rotate about shafts 18 and cause the first ends 21a of the L-shaped members 21 to rotate or otherwise move so that the second ends 21b of the L-shaped members move rearwardly. Rearward movement of the second ends 21b of the L-shaped members causes the distal ends of the arms 25 to move rearwardly and rotation of the arms 25 and leg connecting bodies 24 to occur so that the legs 5 are rotated toward their first position and feet 3 are rotated to their first position. The second rods 22 also slide through the openings of the second ends 21b of the L-shaped members in a direction that is away from the respective pins 23 to which the second rods 22 are attached during rearward movement of the L-shaped member. The pins 23 also rotate and moves rearwardly during rearward motion of the second ends 21b of the L-shaped members 21 so that the arms 25 to which the pins 23 are attached are rotated about the axles defined by the cylindrical elements 27 during the rearward movement of the L-shaped members 21 in a direction that is opposite the direction the arms are rotated when the second ends 21b of the L-shaped members 21 were moved forwardly. When moving from the second position of the front feet 3a to the first position of the front feet 3a, the front feet 3a are moved closer to each other. When moving from the second position of the rear feet 3b to the first position of the rear feet 3b, the rear feet 3b are moved farther away from each other.

Multiple embodiments of the article of furniture may be provided. For instance, multiple tables embodying the article of furniture may be provided. The tabletops 7 of each table may be moved to the second position so that the feet and legs of the table are moved to their second positions. Thereafter, the tables may be placed in a line and nested together so that immediately adjacent tables are nested with other tables in a line of tables. For instance, a first table may be

nested with a second table so that the rear feet 3b of the first table extend under the tabletop of the second table between the legs of the second table. A third table moved to the second position may then be nested with the fist table that is in the second position so that the rear feet 3b of the third table extend below the tabletop of the first table between the legs of the first table.

It should be appreciated that variations to the article of furniture may be made to form embodiments of our article of furniture. For instance, a tilt mechanism 14 may be connected to multiple connector members 11, but a latch mechanism 15 may only be connected to one connector member 11 to lock and unlock the tabletop 7 for tilting of the tabletop 7. As another example, the leg rotating mechanisms 13 may each be connected to a respective housing instead of a cross member 9. Each housing may be positioned adjacent a respective leg and a respective connector member 11 for connecting the leg rotating mechanism between a respective leg 5 and the tabletop 7. As such, the housings could replace the carriages 10 and cross member 9. As yet another example, the L-shaped members 21 could be replaced with a member having a different shape or interconnected linkages that are pivotally connected together or may be replaced with a cabling arrangement.

As yet another example, embodiments of the article may be chairs and may be configured for use in connection with legs of a chair to facilitate the stowing of chairs or storage of chairs. Such an arrangement may be useful for side seating arrangements, for example. For such embodiments, the tabletops 7 would be a different structure, such as seats of a chair and the legs 5 may be legs of a chair. The tilting mechanism 14, latch mechanism 15 and leg rotating mechanism 13 may each be attached between the seat of the chair and legs of the chair. One or more connector members 11 may be connected to a bottom surface of the seat when the chair is

in a sitting position for connecting the tilting mechanism 14, latch mechanism 15, and leg rotating mechanism 13 between the seat and the legs of the chair.

As yet another example, each leg 5 may be a member that connects multiple legs of a chair or table legs to a leg rotating mechanism for rotating those table legs or chair legs. As yet another example, the cross member 9 may be formed from a unitary beam or from multiple beam elements that are fastened together to form the cross member. As yet another example, articles of furniture may have multiple sets of legs and multiple cross members so that a respective cross member is connected between a respective set of legs.

Therefore it should be understood that while certain exemplary embodiments of articles of furniture and methods of making and using the same have been discussed and illustrated herein, it is to be distinctly understood that the invention is not limited thereto but may be otherwise variously embodied and practiced within the scope of the following claims.

What is claimed is:

1. An article of furniture comprising:

a first structure having a first surface and a second surface opposite the first surface, the first and second surfaces extending from a first edge of the first structure to a second edge of the first structure that is opposite the first edge of the first structure;

a first tilting mechanism attached to the first structure, the first tilting mechanism sized and configured such that the first structure is rotatable from a first position to a second position, the first edge of the first structure being at a first elevation when the first structure is in the first position and the first edge of the first structure being at a second elevation that is higher than the first elevation when the first structure is in the second position;

a first leg, the first leg being movable from a first position to a second position;

a first leg rotating mechanism attached between the first leg and the first tilting mechanism, the first leg rotating mechanism rotating the first leg from the first position of the first leg to the second position of the first leg when the first structure is rotated from the first position of the first structure to the second position of the first structure.

2. The article of furniture wherein the article of furniture is a table or a chair, the first structure is a tabletop or a seat.

3. The article of furniture in claim 2 further comprising:

a second leg, the second leg being movable from a first position to a second position;

a second tilting mechanism attached to the first structure, the second tilting mechanism sized and configured such that the first structure is rotatable from the first position to the second position,

a second leg rotating mechanism attached between the second leg and the second tilting mechanism, the second leg rotating mechanism rotating the second leg from the first position of the second leg to the second position of the second leg when the first structure is rotated from the first position of the first structure to the second position of the first structure.

4. The article of furniture of claim 3 further comprising:

at least one first foot connected to the first leg; and

at least one second foot connected to the second leg.

5. The article of furniture of claim 4 wherein:

the first tilting mechanism comprising a first carriage positioned between the first leg and the first tilting mechanism, the first carriage connected to the first structure such that the first structure is rotatable about a horizontal axis from the first position of the first structure to the second position of the first structure; and

the first leg rotating mechanism comprising a first member, a first arm, and a first leg connecting body connecting the first leg rotating mechanism to the first leg, the first member having a first end connected to a portion of the first tilting mechanism and a second end connected to the first arm, the first end of the first member connected to the first tilting mechanism such that the first member moves when the first structure is moved from the first position of the first structure to the second position of the first structure, the movement of the

first member causing the first arm to move to drive rotation of the first leg connecting body so that the first leg is rotated and the at least one first foot is rotated from a first position to a second position.

6. The article of furniture of claim 5 wherein:

the second tilting mechanism comprising a second carriage positioned between the second leg and the second tilting mechanism, the second carriage connected to the first structure such that the first structure is rotatable about the horizontal axis from the first position of the first structure to the second position of the first structure; and

the second leg rotating mechanism comprising a second member, a second arm, and a second leg connecting body connecting the second leg rotating mechanism to the second leg, the second member having a first end connected to a portion of the second tilting mechanism and a second end connected to the second arm, the first end of the second member connected to the second tilting mechanism such that the second member moves when the first structure is moved from the first position of the first structure to the second position of the first structure, the movement of the second member causing the second arm to move to drive rotation of the second leg connecting body so that the second leg is rotated and the at least one second foot is rotated from a first position to a second position.

7. The article of furniture of claim 6 further comprising:

wherein the first tilting mechanism is comprised of a first connector member and a first shaft connected to the first connector member, the first shaft also connected to the first carriage such that the first connector member is rotatable about the first shaft;

wherein the second tilting mechanism is comprised of a second connector member and a second shaft connected to the second connector member, the second shaft also connected to the second carriage such that the second connector member is rotatable about the second shaft;

the first connector member attached to the first surface of the first structure and the second connector member attached to the first surface of the first structure;

wherein the first and second connector members connect the first structure to the first and second tilting mechanisms to permit the first structure to be rotated from the first position of the first structure to the second position of the first structure, the first and second shafts defining an axis about which the first structure is rotatable.

8. The article of furniture of claim 7 wherein the first member of the first leg rotating mechanism extends from adjacent the first connector member to adjacent the first arm and wherein the second member of the second leg rotating mechanism extends from adjacent the second connector member to adjacent the second arm.

9. The article of furniture of claim 7 further comprising a cross member extending between the first leg and the second leg, the first arm being positioned within a first end of the cross member and the second arm being positioned within a second end of the cross member that is opposite the first end of the cross member, the first carriage attached to the cross member such that the first arm is below the first carriage and the second carriage attached to the cross member such that the second arm is below the second carriage.

10. The article of furniture of claim 9 wherein the first leg rotating mechanism is also comprised of a first pin attached to a distal end of the first arm, and a first element extending from the first pin to the second end of the first member; and

the second leg rotating mechanism is also comprised of a second pin attached to a distal end of the second arm and a second element extending from the second pin to the second end of the second member.

11. The article of furniture of claim 10 wherein the first pin is rotatably connected to the distal end of the first arm and wherein the second pin is rotatably connected to the distal end of the second arm.

12. The article of furniture of claim 11 wherein the first element is slideably connected to the second end of the first member and wherein the second element is slideably connected to the second end of the second member.

13. The article of furniture of claim 12 wherein the first leg rotating mechanism is also comprised of a first axle extending through a portion of the first arm, the first arm being rotatable about the first axle such that movement of the distal end of the first arm causes rotation of the first arm about the first axle and drives rotation of the first leg connecting body; and

the second leg rotating mechanism is also comprised of a second axle extending through a portion of the second arm, the second arm being rotatable about the second axle such that the movement of the distal end of the second arm causes rotation of the second arm about the second axle and drives rotation of the second leg connecting body.

14. The article of furniture of claim 13 wherein the at least one first foot is comprised of a first front foot and a first rear foot and the at least one second foot is comprised of a second rear foot and a second front foot; and

when the first front foot is in the second position of the first front foot and the second front foot is in the second position of the second front foot, the first and second front feet are farther apart as compared to when the first front foot is in the first position of the first front foot and the second front foot is in the first position of the second front foot; and

when the first rear foot is in the second position of the first rear foot and the second rear foot is in the second position of the second rear foot, the first and second rear feet are closer together as compared to when the first rear foot is in the first position of the first rear foot and the second rear foot is in the first position of the second rear foot.

15. The article of furniture of claim 14 wherein the first front foot is a caster, the second front foot is a caster, the third front foot is a caster and the fourth front foot is a caster.

16. The article of furniture of claim 5 wherein the at least one first foot is comprised of a plurality of casters and the at least one second foot is comprised of a plurality of casters.

17. The article of furniture of claim 5 wherein the first member of the first leg rotating mechanism is a generally L-shaped member, a generally C-shaped member, a generally U-shaped member or a generally V-shaped member.

18. The article of furniture of claim 17 wherein the second member of the second leg rotating mechanism is a generally L-shaped member, a generally C-shaped member, a generally U-shaped member or a generally V-shaped member.

19. A method of stacking tables comprising:

providing a plurality of tables, each of the tables being an article of furniture of any of claim 1;

moving the first structure of each of the tables from the first position to the second position so that the first leg is also moved from the first position of the first leg to the second position of the first leg;

nesting the tables adjacent to each other.

20. An article of furniture comprising:

a tabletop having a first surface and a second surface opposite the first surface, the first and second surfaces extending from a first edge of the tabletop to a second edge of the tabletop that is opposite the first edge of the tabletop;

a first tilting mechanism attached to the tabletop, the first tilting mechanism being sized and configured such that the first tabletop is rotatable from a first position to a second position, the first edge of the tabletop being at a first elevation when the tabletop is in the first position and the second edge of the tabletop being at a second elevation when the tabletop is in the second position, the second elevation being higher than the first elevation;

a first leg attached to the first tilting mechanism via a first leg rotating mechanism attached between the first leg and the first titling mechanism, the first leg rotating mechanism

being attached between the first leg and the first tilting mechanism such that the first leg is moveable from a first position to a second position when the tabletop is moved from the first position of the tabletop to the second position of the tabletop;

a second leg, the second leg being movable from a first position to a second position;

a second tilting mechanism attached to the tabletop, the second tilting mechanism sized and configured such that the tabletop is rotatable from the first position to the second position,

a second leg rotating mechanism attached between the second leg and the second tilting mechanism, the second leg rotating mechanism being configured to rotate the second leg from the first position of the second leg to the second position of the second leg when the tabletop is rotated from the first position of the first structure to the second position of the first structure.

21. The article of furniture of claim 20, wherein:

the first tilting mechanism comprising

a first carriage positioned between the first leg and the first tilting mechanism,

a first connector member attached to the first surface of the tabletop and rotatably connected to the first carriage,

a first shaft attached to the first connector member, and

the second tilting mechanism comprising:

a second carriage positioned between the second leg and the second tilting mechanism,

a second connector member attached to the first surface of the tabletop and rotatably connected to the second carriage, and

a second shaft attached to the second connector member;

the first leg rotating mechanism comprising:

a first member having a first end connected to the first shaft and a second end opposite the first end of the first member,

a first arm,

a first pin rotatably attached to a distal end of the first arm,

a first element extending from the first pin to within the second end of the first member, the first element being moveably positionable within the second end of the first member,

a first leg connecting body connecting the first arm to the first leg,

a first axle extending through a portion of the first arm, the first arm being rotatable about the first axle such that movement of the distal end of the first arm causes rotation of the first arm about the first axle and causes movement of the first leg connecting body to rotate the first leg from the first position of the first leg to the second position of the first leg;

the second leg rotating mechanism comprising:

a second member having a first end connected to the second shaft and a second end opposite the first end of the second member,

a second arm,

a second pin rotatably attached to a distal end of the second arm,

a second element extending from the second pin to within the second end of the second member, the second element being moveably positionable within the second end of the second member,

a second leg connecting body connecting the second arm to the second leg,

a second axle extending through a portion of the second arm, the second arm being rotatable about the second axle such that movement of the distal end of the second arm causes rotation of the second arm about the second axle and causes rotation of the second leg connecting body to rotate the second leg from the first position of the second leg to the second position of the second leg;

the first and second shafts defining an axis about which the tabletop is rotatable when the tabletop moves from the first position to the second position;

the first end of the first member of the first leg rotation mechanism rotating during movement of the tabletop from the first position of the tabletop to the second position of the tabletop, rotation of the first end of the first member causing the first element to move within the second end of the first member and causing the first pin to rotate relating to the distal end of the first arm and also causing the first pin to move to drive rotation of the first arm about the first axle such that the first leg connecting body moves to rotate the first leg from the first position of the first leg to the second position of the first leg; and

the first end of the second member of the second leg rotation mechanism rotating during movement of the tabletop from the first position of the tabletop to the second position of the tabletop, rotation of the first end of the second member causing the second element to move within the second end of the second member and causing the second pin to rotate relating to the distal end of the second arm and also causing the second pin to move to drive rotation of the second arm about the second axle such that the second leg connecting body moves to rotate the second leg from the first position of the second leg to the second position of the second leg.

22. The article of furniture of claim 21 further comprising a cross member extending between the first leg and the second leg, the first arm being positioned within a first end of the cross member and the second arm being positioned within a second end of the cross member that is opposite the first end of the cross member, the first carriage attached to the cross member such that the first arm is below the first carriage and the second carriage attached to the cross member such that the second arm is below the second carriage.

23. The article of furniture of claim 20, comprising a first front foot and a first rear foot connected to the first leg and a second front foot and a second rear foot connected to the second leg.

24. The article of furniture of claim 23, wherein the first front foot and the second front foot are moved away from each other when the first and second legs are moved from their first positions to their second positions.

25. The article of furniture of claim 24, wherein the first rear foot and the second rear foot are moved to be closer to each other when the first and second legs are moved from their first positions to their second positions.

26. The article of furniture of claim 22, wherein the first member of the first leg rotating mechanism also has an intermediate member extending between the first and second ends of the first member of the first leg rotating mechanism such that the first member is a generally L-

shaped member, a generally C-shaped member, a generally U-shaped member or a generally V-shaped member; and

wherein the second member of the second leg rotating mechanism also has an intermediate member extending between the first and second ends of the second member of the second leg rotating mechanism such that the second member is a is a generally L-shaped member, a generally C-shaped member, a generally U-shaped member or a generally V-shaped member.

27. The article of furniture of claim 26, wherein the first element is a rod, a linearly extending member, a pin or a shaft and the second element is a rod, a linearly extending member, a pin or a shaft.

28. The article of furniture of claim 26, wherein the first shaft is a linearly extending member and the second shaft is a linearly extending member.

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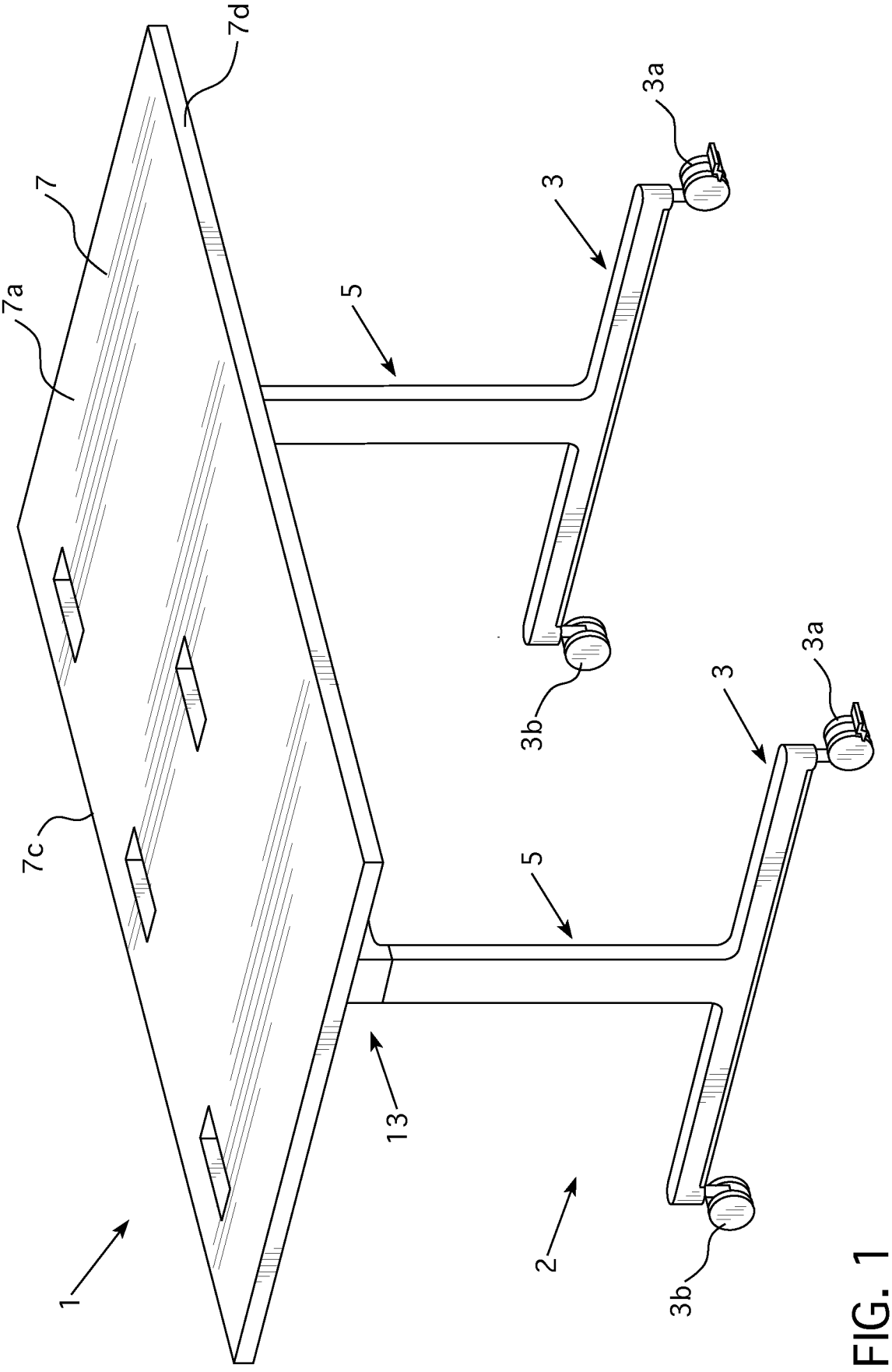

FIG. 1

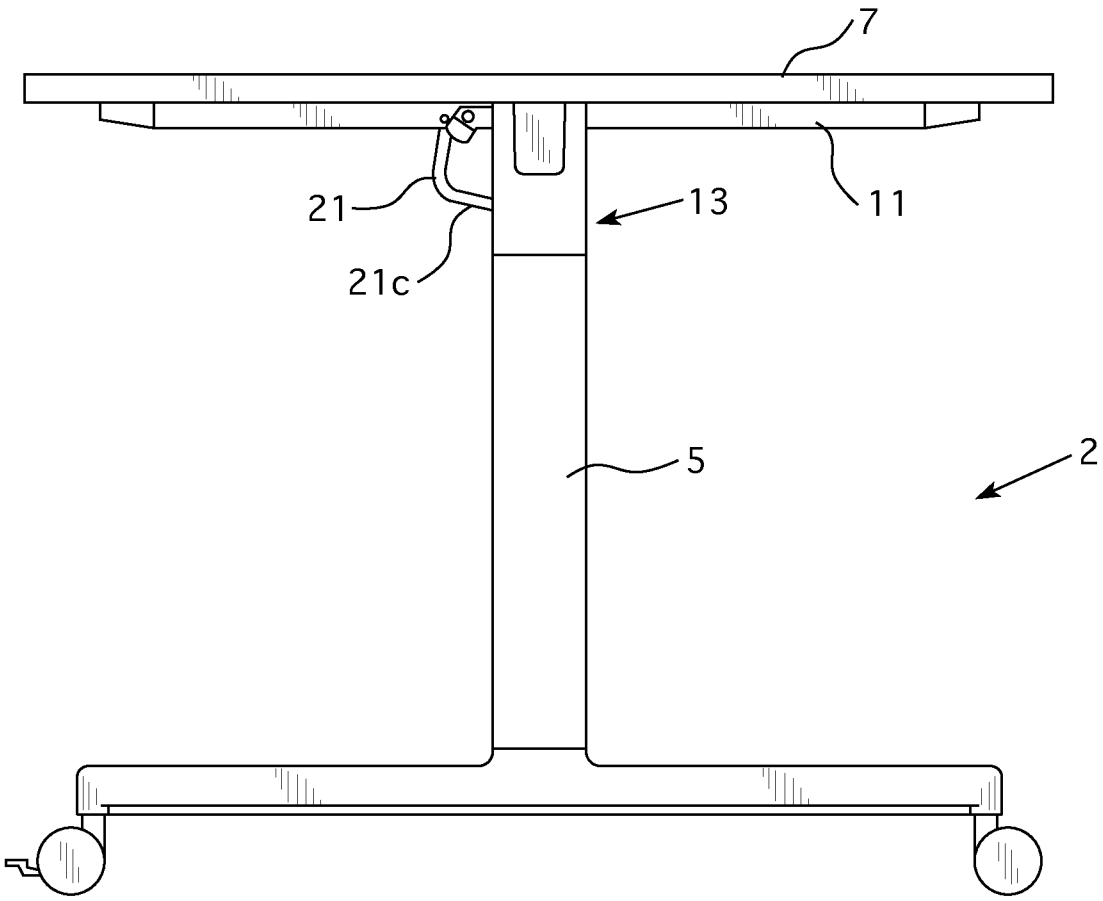

FIG. 2

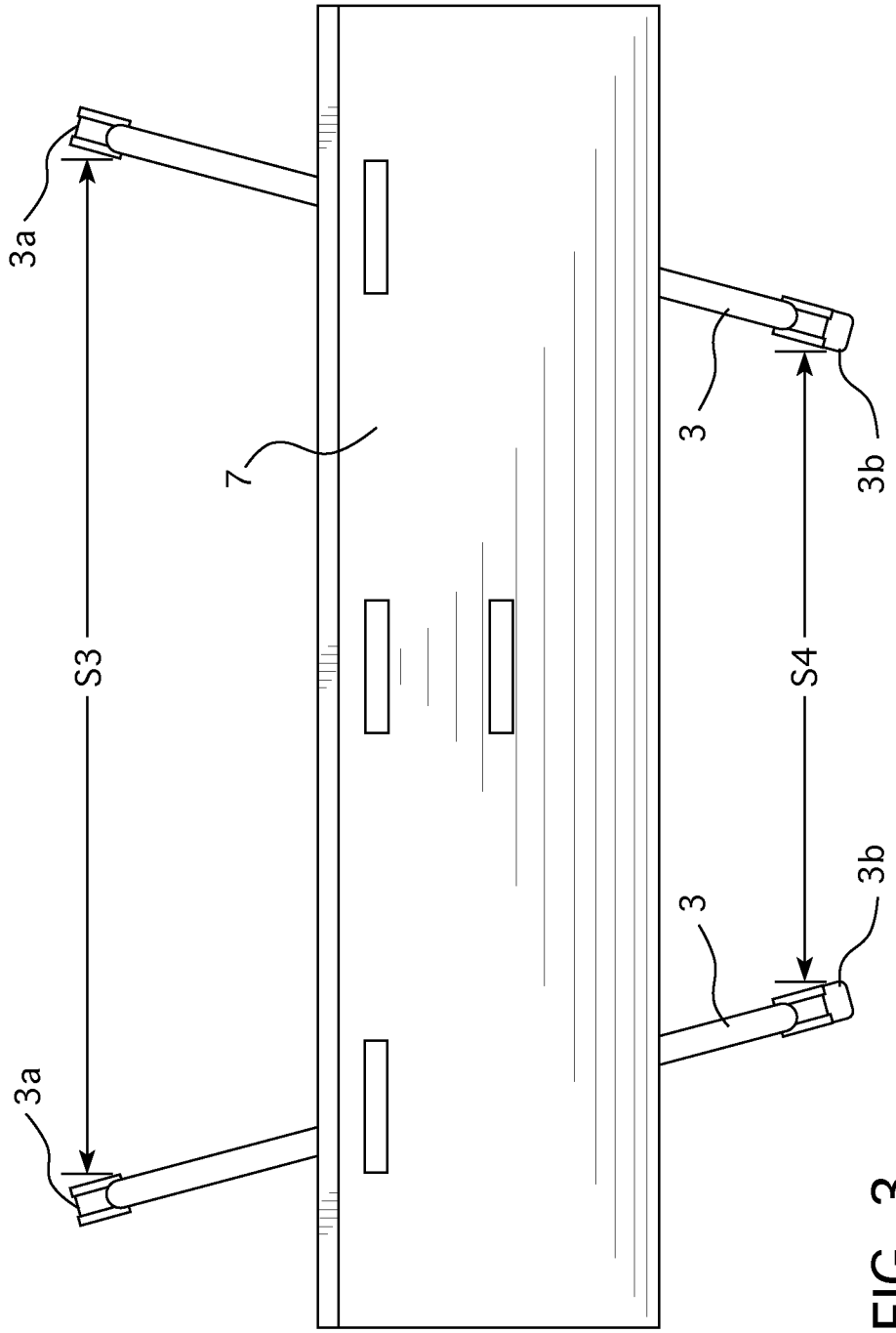

FIG. 3

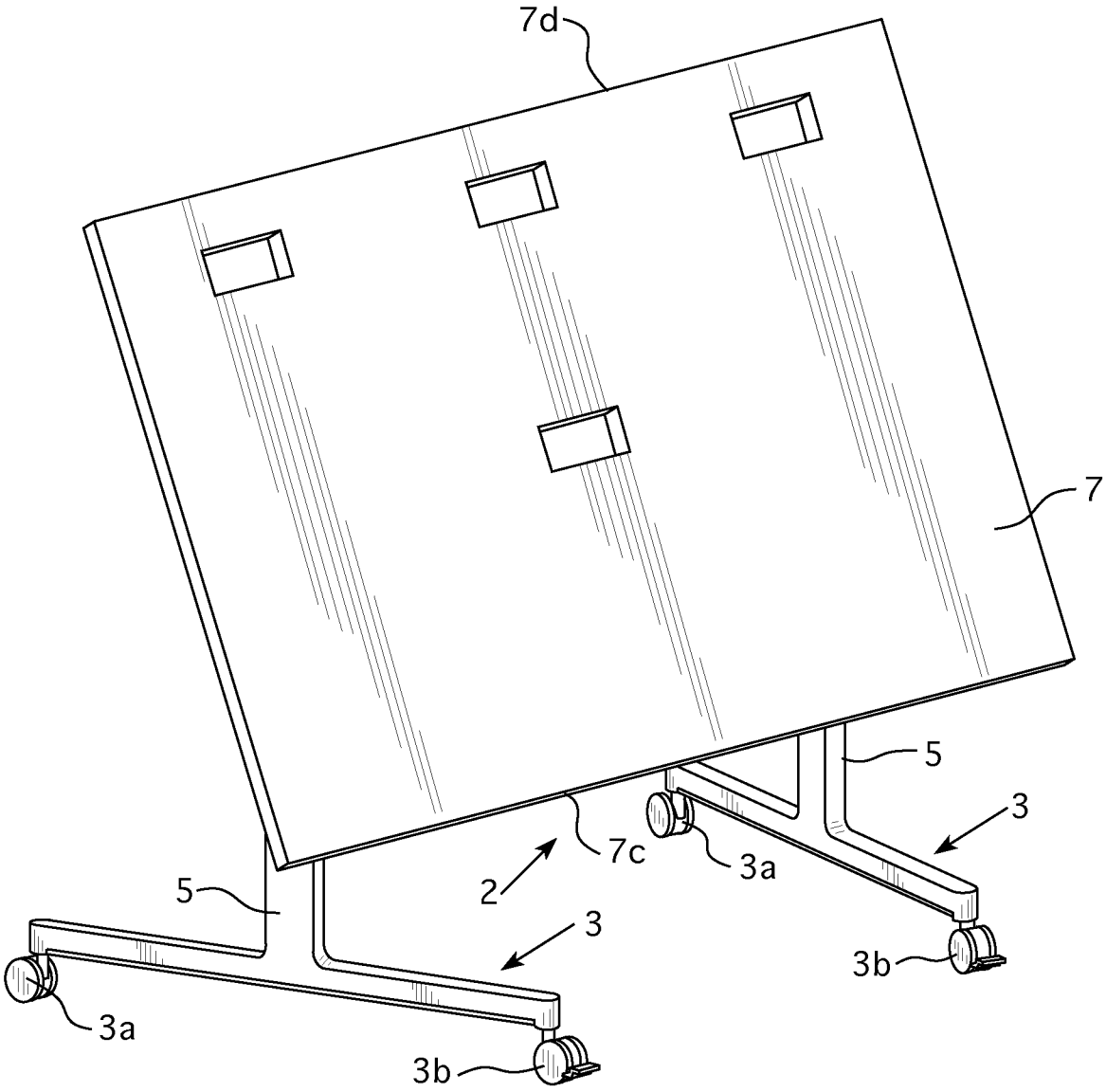

FIG. 4

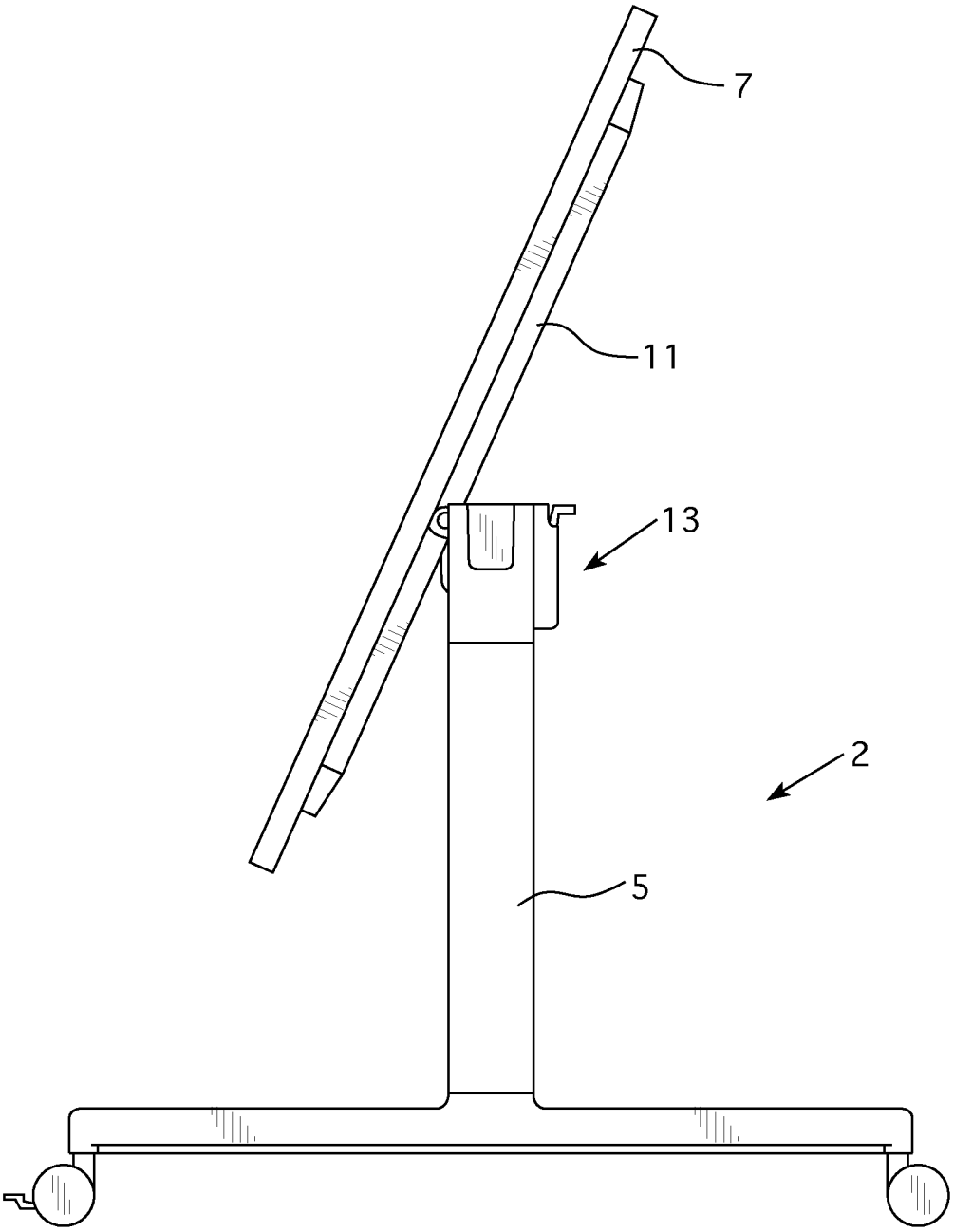

FIG. 5

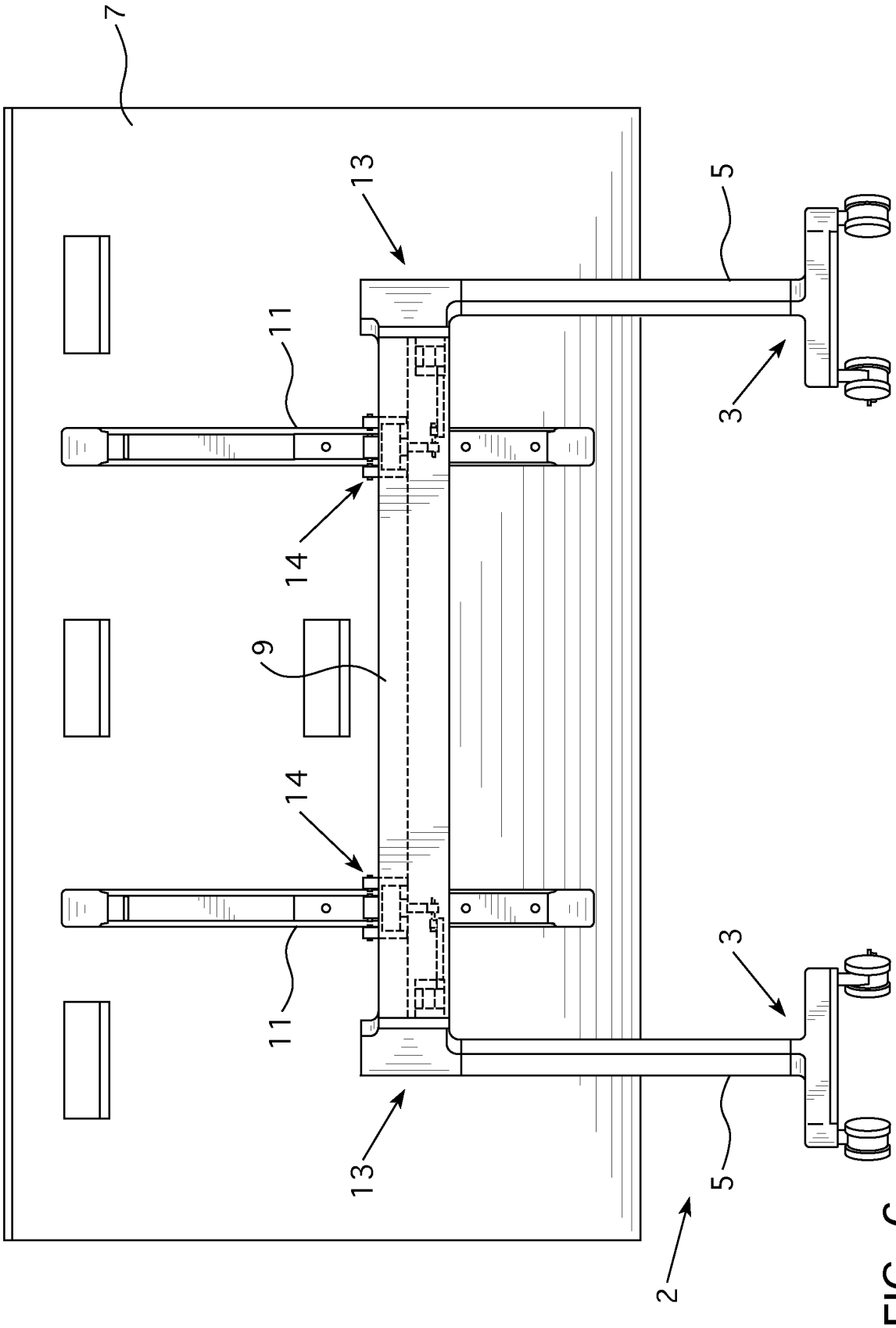

FIG. 6

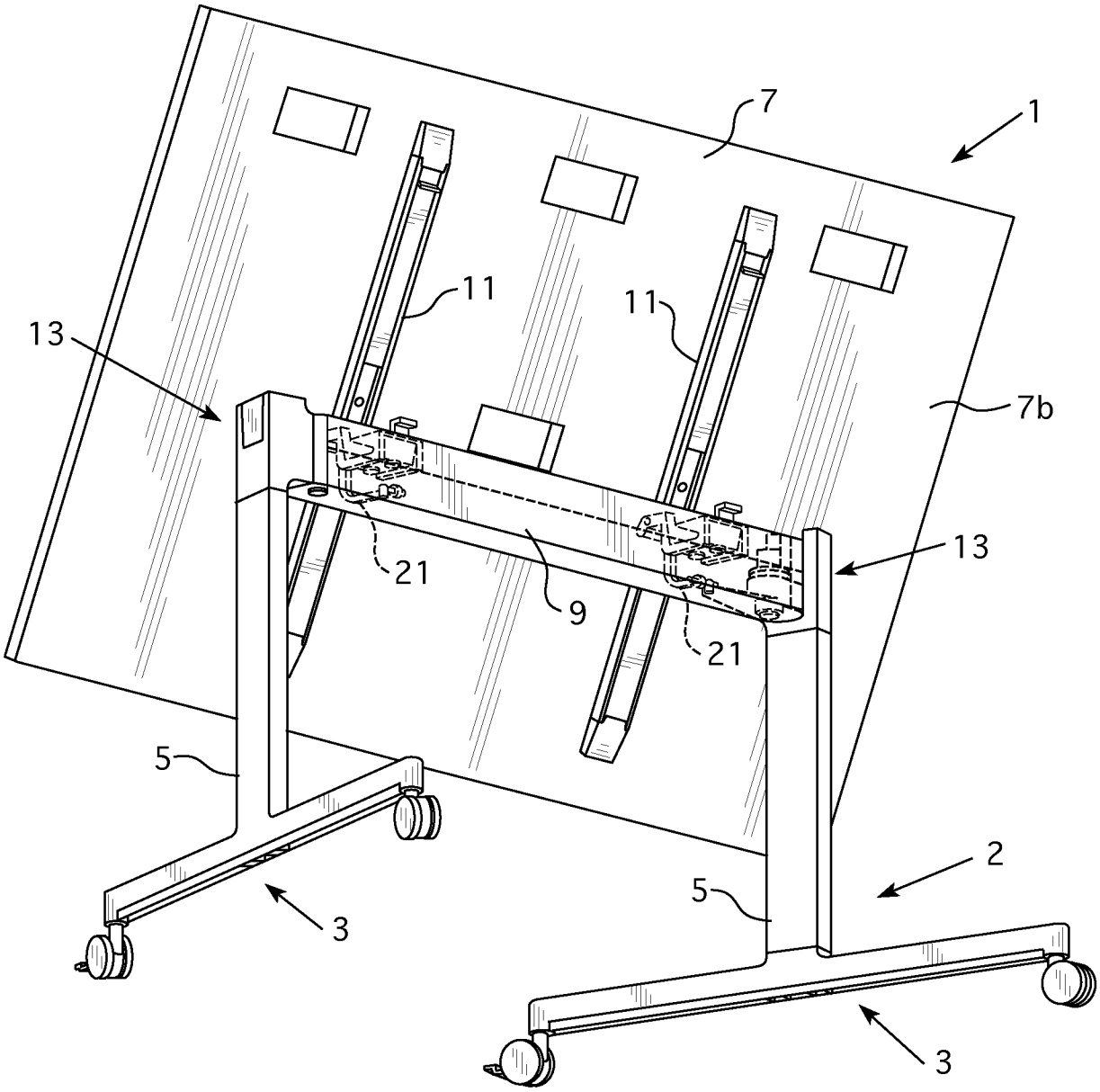

FIG. 7

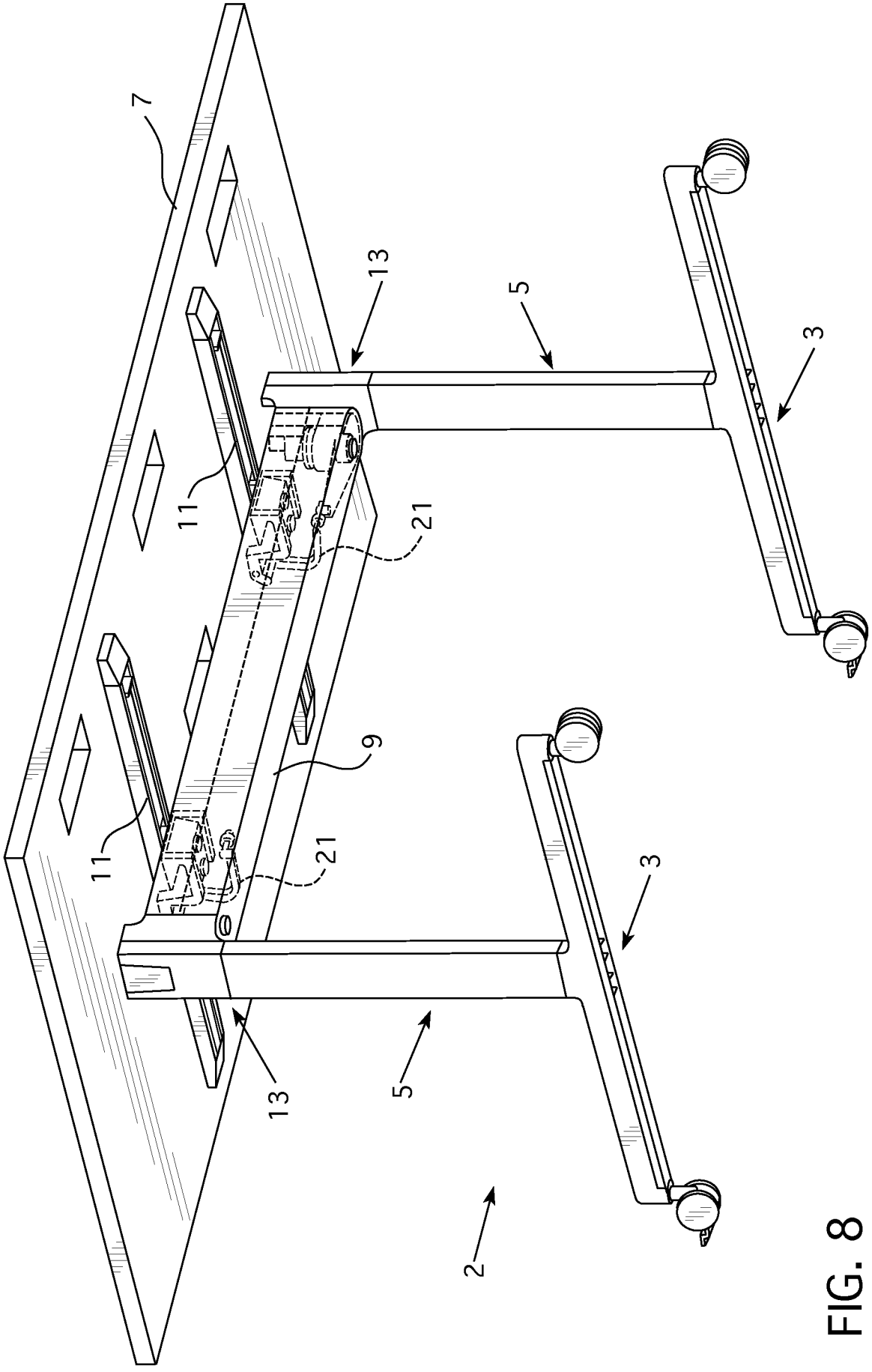

FIG. 8

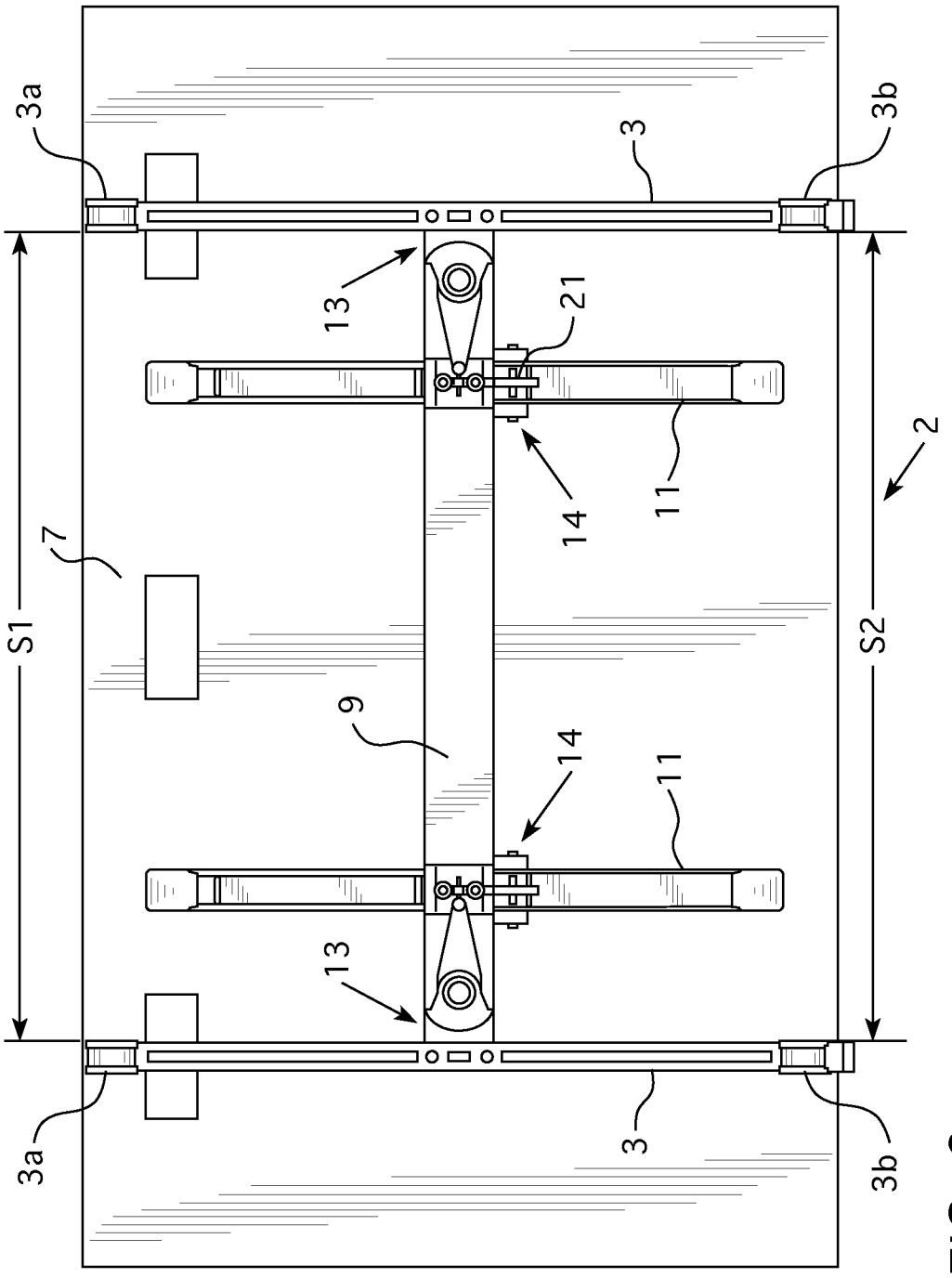

FIG. 9

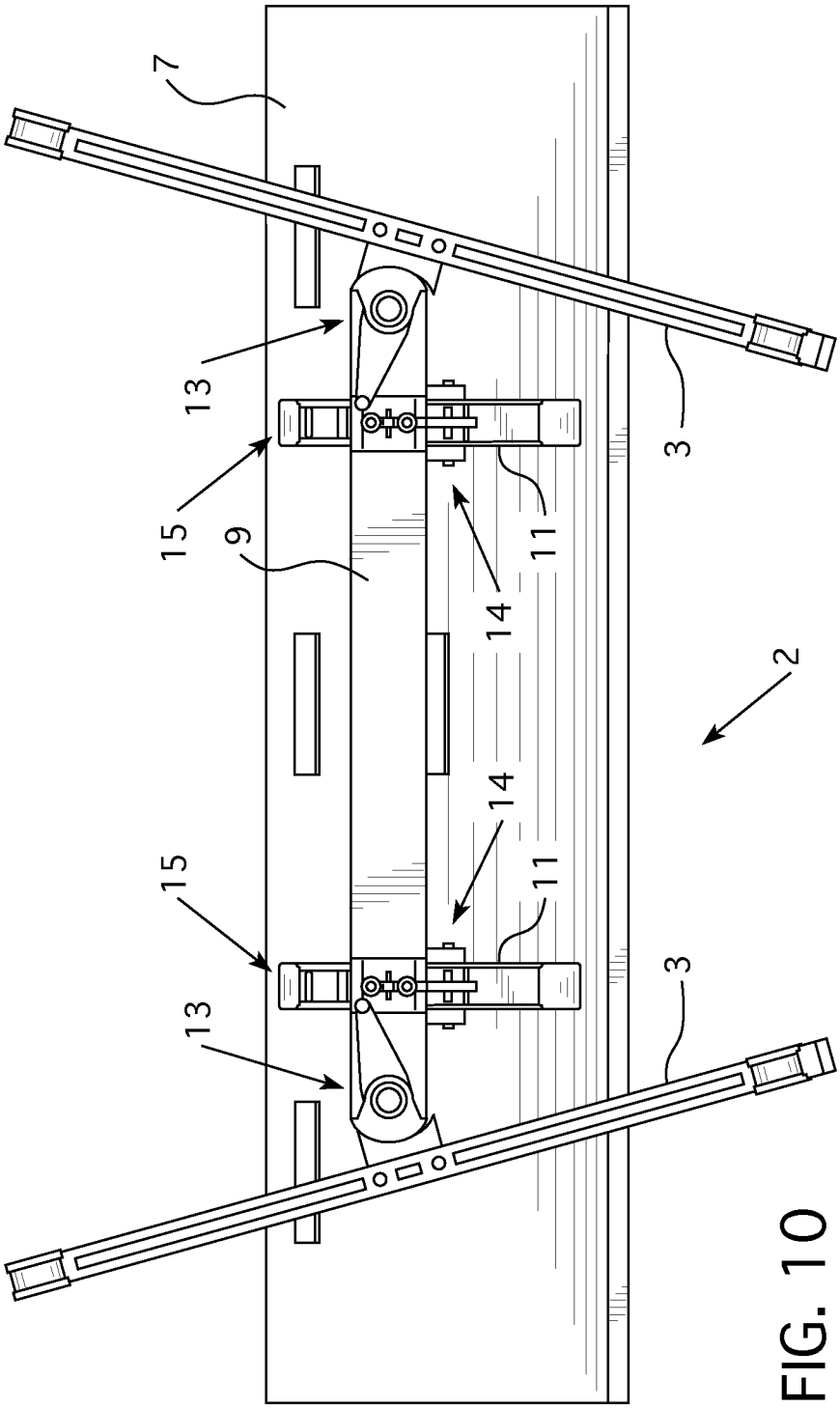

FIG. 10

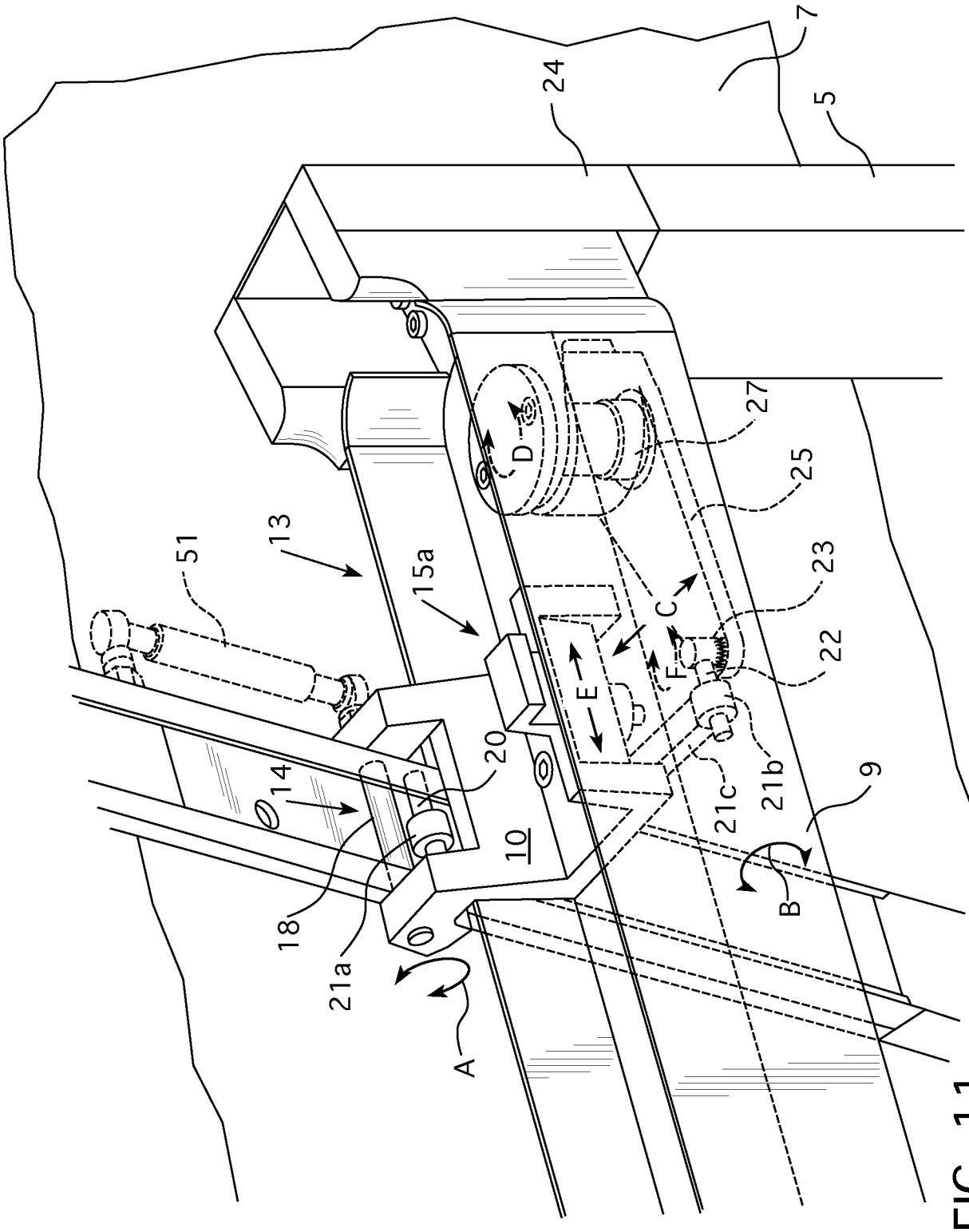

FIG. 11

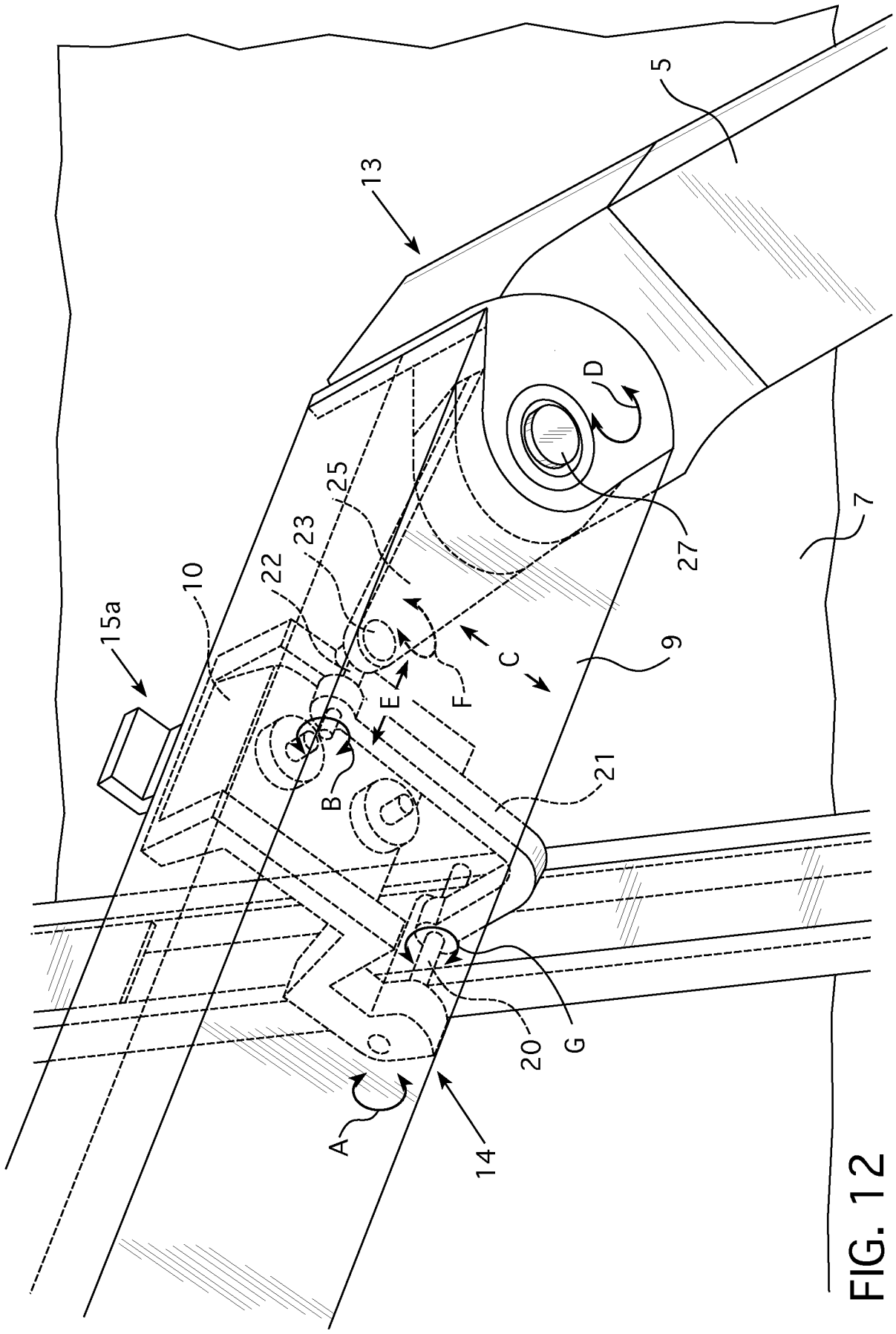

FIG. 12

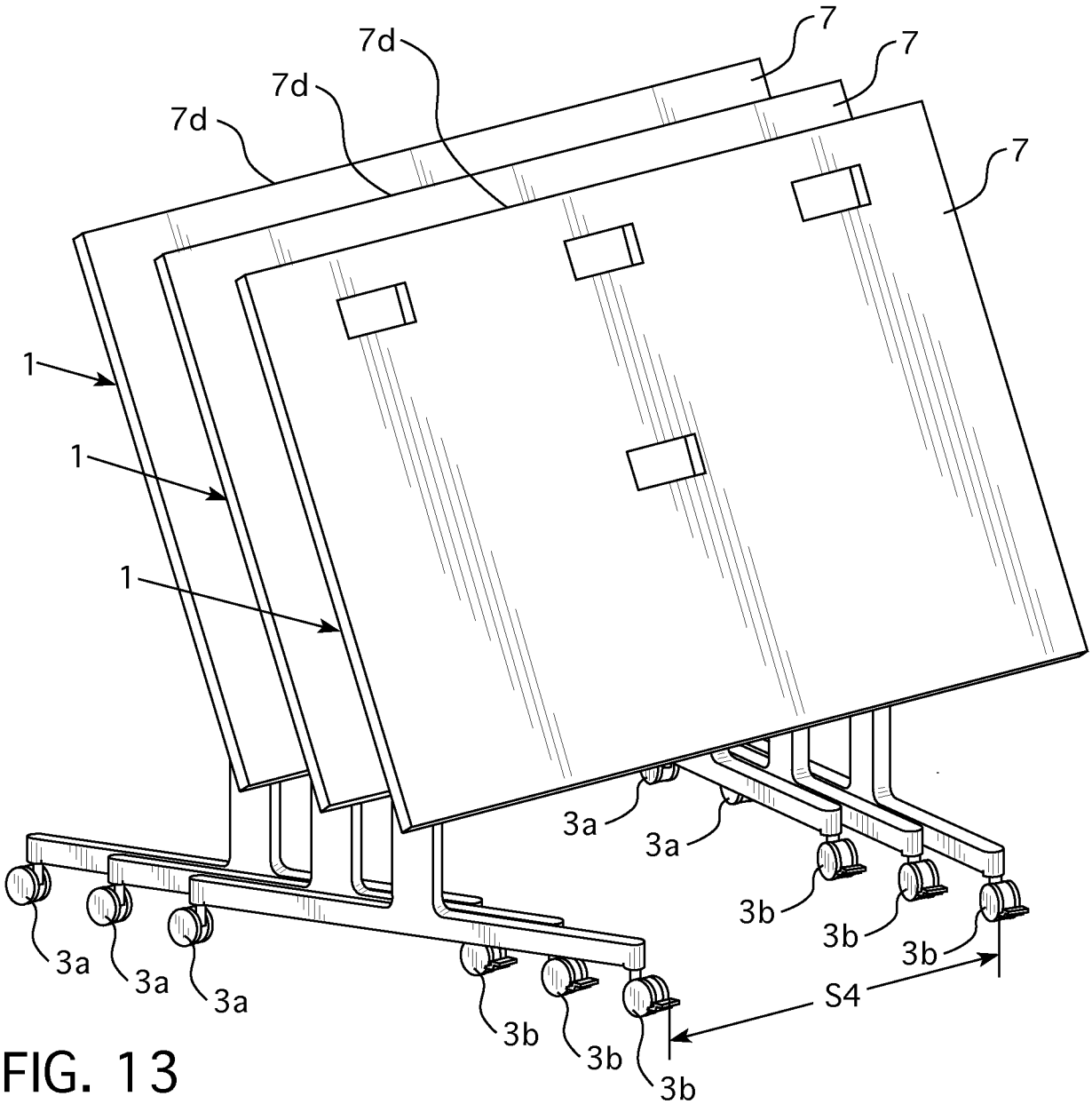

FIG. 13

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2014/062137

A. CLASSIFICATION OF SUBJECT MATTER
INV. A47B7/02
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
A47B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y A	EP 1 308 109 A1 (WINI BUEROMOEBEL GEORG SCHMIDT [DE]) 7 May 2003 (2003-05-07) paragraph [0018] - paragraph [0033]; figures 1-4	1-4,20, 23-25 19 5-18,21, 22,26-28
Y	EP 1 836 926 A1 (WINI BUEROMOEBEL GEORG SCHMIDT [DE]) 26 September 2007 (2007-09-26) paragraph [0003] - paragraph [0057]; figures 1-11	19
A	EP 1 958 537 A1 (PRO CORD SPA [IT]) 20 August 2008 (2008-08-20) paragraph [0007] - paragraph [0021]; figures 1-12	1

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
19 November 2014	27/11/2014

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Lehe, Jörn

1

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/US2014/062137

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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		JP 2008212664 A	18-09-2008
		US 2008196635 A1	21-08-2008

(19)中华人民共和国国家知识产权局

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代理人 翟羽

(51)Int.Cl.
A47B 7/02(2006.01)

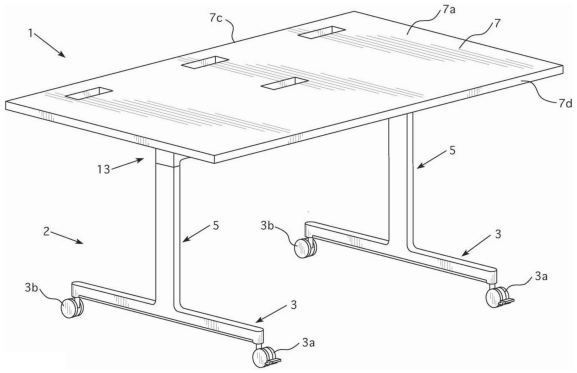
权利要求书5页 说明书11页 附图13页

(54)发明名称

家具和将该家具排叠的方法

(57)摘要

家具(1)，其包括某结构，结构具有支撑重量的表面(7)。该表面可以是可从第一位置和第二位置倾斜的，在第一位置中该表面是平放或实质上水平的，在第二位置中该表面是实质上垂直的。至少一个腿部(5)旋转机制(13)可将该家具的至少一条腿附接至该表面以致当该表面被倾斜时该至少一条腿可绕垂直轴心旋转。在某些实施例中，该家具可为桌子而该表面可为桌面。在其它实施例中，该家具可为椅子而该表面可为座位的就座表面。



CN 105899103 A

1.一件家具,其包含:

第一结构,其具有第一表面和背对该第一表面的第二表面,该第一和第二表面从该第一结构的第一边缘延伸至该第一结构的第二边缘,第一结构的第一边缘和第二边缘相对;

附接至第一结构的第一倾斜机制,其被配置及尺寸被设置以致该第一结构可从第一位置旋转至第二位置,该第一结构处于第一位置时该第一结构的第一边缘处于第一高度,该第一结构处于第二位置时该第一结构的第一边缘处于比第一高度高的第二高度;

第一腿,该第一腿可从第一位置被移至第二位置;

第一腿部旋转机制,其附接于该第一腿和该第一倾斜机制之间,当该第一结构从该第一结构的第一位置被旋转至该第一结构的第二位置时,该第一腿部旋转机制将第一腿从第一腿的第一位置旋转至第一腿的第二位置。

2.该件家具,其中该件家具为桌子或椅子,该第一结构为桌面或座位。

3.如权利要求2所述的该件家具,其进一步包含:

第二腿,第二腿可从第一位置被移至第二位置;

附接至第一结构的第二倾斜机制,第二倾斜机制被配置及尺寸被设置以致该第一结构可从第一位置旋转至第二位置,

第二腿部旋转机制,其附接于该第二腿和该第二倾斜机制之间,当该第一结构从该第一结构的第一位置被旋转至该第一结构的第二位置时,该第二腿部旋转机制将第二腿从第二腿的第一位置旋转至第二腿的第二位置。

4.如权利要求3所述的该件家具,其进一步包含:

连接至该第一腿的至少一只第一脚;以及

连接至该第二腿的至少一只第二脚。

5.如权利要求4所述的该件家具,其中:

第一倾斜机制包含定位于第一腿和第一倾斜机制之间的第一滑架,该第一滑架连接至该第一结构以致该第一结构可绕水平轴心从第一结构的第一位置旋转至第一结构的第二位置;而

该第一腿部旋转机制包含第一部件、第一臂、以及将第一腿部旋转机制连接至第一腿的连接第一腿的主体,该第一部件具有连接至第一倾斜机制的部分的第一端以及连接至该第一臂的第二端,该第一部件的第一端连接至该第一倾斜机制以致当第一结构由第一结构的第一位置被移至第一结构的第二位置时该第一部件移动,该第一部件的移动导致第一臂移动以驱动该连接第一腿的主体旋转,以致该第一腿被旋转而该至少一只第一脚从第一位置被旋转至第二位置。

6.如权利要求5所述的该件家具,其中:

第二倾斜机制包含定位于第二腿和第二倾斜机制之间的第二滑架,该第二滑架连接至该第一结构以致该第一结构可绕该水平轴心从第一结构的第一位置旋转至第一结构的第二位置;而

该第二腿部旋转机制包含第二部件、第二臂、以及将第二腿部旋转机制连接至第二腿的连接第二腿的主体,该第二部件具有连接至第二倾斜机制的部分的第一端以及连接至该第二臂的第二端,该第二部件的第一端连接至该第二倾斜机制以致当第一结构由第一结构的第一位置被移至第一结构的第二位置时该第二部件移动,该第二部件的移动导致第二臂

移动以驱动该连接第二腿的主体旋转，以致该第二腿被旋转，而该至少一只第二脚从第一位置被旋转至第二位置。

7.如权利要求6所述的该件家具，其进一步包含：

其中该第一倾斜机制包含第一连接器部件，以及连接至该第一连接器部件的第一轴杆，该第一轴杆亦连接至第一滑架，以致该第一连接器部件可绕该第一轴杆旋转；

其中该第二倾斜机制包含第二连接器部件，以及连接至该第二连接器部件的第二轴杆，该第二轴杆亦连接至第二滑架，以致该第二连接器部件可绕该第二轴杆旋转；

该第一连接器部件附接至该第一结构的该第一表面，该第二连接器部件亦附接至该第一结构的该第一表面；

其中该第一和第二连接器部件将第一结构连接至第一和第二倾斜机制，以允许该第一结构从该第一结构的第一位置被旋转至该第一结构的第二位置，其中第一和第二轴杆限定第一结构可围绕而旋转的轴心。

8.如权利要求7所述的该件家具，其中该第一腿部旋转机制的第一部件从邻接第一连接器部件延伸至邻接第一臂，且其中该第二腿部旋转机制的第二部件从邻接第二连接器部件延伸至邻接第二臂。

9.如权利要求7所述的该件家具，其进一步包含于第一腿和第二腿之间延伸的交叉部件，第一臂定位于该交叉部件的第一端内，第二臂定位于交叉部件的第二端内，其中交叉部件的第一端和第二端相对；第一滑架被附接至该交叉部件以致第一臂位于第一滑架之下，而第二滑架被附接至该交叉部件以致第二臂位于第二滑架之下。

10.如权利要求9所述的该件家具，其中该第一腿部旋转机制还包含附接至第一臂远端的第一销，以及从第一销延伸至第一部件的第二端的第一元件；而

第二腿部旋转机制还包含附接至第二臂远端的第二销，以及从第二销延伸至第二部件的第二端的第二元件。

11.如权利要求10所述的该件家具，其中该第一销是可旋转地连接至第一臂的远端，且其中该第二销是可旋转地连接至第二臂的远端。

12.如权利要求11所述的该件家具，其中该第一元件是可滑动地连接至第一部件的第二端，且其中该第二元件是可滑动地连接至第二部件的第二端。

13.如权利要求12所述的该件家具，其中该第一腿部旋转机制还包含穿过第一臂某部分而延伸的第一轴，第一臂可绕第一轴旋转以致第一臂的远端的运动导致第一臂绕第一轴旋转并驱动连接第一腿的主体旋转；而

该第二腿部旋转机制还包含穿过第二臂某部分而延伸的第二轴，第二臂可绕第二轴旋转以致第二臂的远端的运动导致第二臂绕第二轴旋转并驱动连接第二腿的主体旋转。

14.如权利要求13所述的该件家具，其中该至少一只第一脚包含第一前脚和第一后脚而该至少一只第二脚包含第二后脚和第二前脚；而

当该第一前脚处于第一前脚的第二位置而该第二前脚处于第二前脚的第二位置时，第一前脚离第二前脚的距离是比第一前脚处于第一前脚的第一位置而第二前脚处于第二前脚的第一位置期间是较远的；而

当该第一后脚处于第一后脚的第二位置而第二后脚处于第二后脚的第二位置时，第一和第二后脚的距离是比当第一后脚处于第一后脚的第一位置而第二后脚处于第二后脚的

第一位置期间是较近的。

15.如权利要求14所述的该件家具，其中该第一前脚是脚轮、第二前脚是脚轮、第三前脚是脚轮、第四前脚是脚轮。

16.如权利要求5所述的该件家具，其中该至少一只第一脚包含多个脚轮，该至少一只第二脚也包含多个脚轮。

17.如权利要求5所述的该件家具，其中该第一腿部旋转机制的第一部件是大体上L形的部件、大体上C形的部件、大体上U形的部件或大体上V形的部件。

18.如权利要求17所述的该件家具，其中该第二腿部旋转机制的第二部件是大体上L形的部件、大体上C形的部件、大体上U形的部件或大体上V形的部件。

19.将桌子排叠的方法，其包含：

提供多张桌子，每张桌子为如权利要求1之任一所述的一件家具；

将每张桌子的第一结构从第一位置移至第二位置，以致第一腿亦从第一腿的第一位置移至第一腿的第二位置；

将桌子彼此邻接地嵌套。

20.一件家具，其包含：

桌面，其具有第一表面以及在第一表面反面的第二表面，该第一和第二表面从该桌面的第一边缘延伸至与该桌面第一边缘相对的该桌面第二边缘；

附接至桌面的第一倾斜机制，其被配置及尺寸被设置以致该第一桌面可从第一位置旋转至第二位置，当该桌面处于第一位置时该桌面的第一边缘处于第一高度，而当该桌面处于第二位置时该桌面的第二边缘处于第二高度，该第二高度比第一高度高；

第一腿，其通过附接于第一腿和第一标题机制之间的第一腿部旋转机制附接至第一倾斜机制，该第一腿部旋转机制被附接于第一腿和第一倾斜机制之间以致当该桌面从桌面的第一位置被移至桌面的第二位置时，第一腿可从第一位置移至第二位置；

第二腿，其可从第一位置移至第二位置；

附接至桌面的第二倾斜机制，该第二倾斜机制被配置及尺寸被设置以致桌面可从第一位置旋转至第二位置，

附接于第二腿和第二倾斜机制之间的第二腿部旋转机制，第二腿部旋转机制被配置以当桌面从第一结构的第一位置被旋转至第一结构的第二位置时将第二腿从第二腿的第一位置旋转至第二腿的第二位置。

21.如权利要求20所述的该件家具，其中：

该第一倾斜机制包含

定位于第一腿和第一倾斜机制之间的第一滑架；

第一连接器部件，其附接至桌面的第一表面并可旋转地连接至第一滑架；

附接至第一连接器部件的第一轴杆；而

该第二倾斜机制包含：

定位于第二腿和第二倾斜机制之间的第二滑架；

第二连接器部件，其附接至桌面的第一表面并可旋转地连接至第二滑架；以及附接至第二连接器部件的第二轴杆；

该第一腿部旋转机制包含：

第一部件，其具有连接至第一轴杆的第一端以及与第一部件第一端相对的第二端；

第一臂；

第一销，其可旋转地附接至第一臂的远端；

第一元件，其从第一销延伸至第一部件的第二端内，该第一元件于第一部件的第二端内是可动地可定位的；

连接第一腿的主体，其将第一臂连接至第一腿；

第一轴，其穿过第一臂某部分而延伸，第一臂可绕第一轴旋转，以致第一臂的远端的运动导致该第一臂绕第一轴旋转并导致该连接第一腿的主体运动以将第一腿从第一腿的第一位置旋转至第一腿的第二位置；

该第二腿部旋转机制包含：

第二部件，其具有连接至第二轴杆的第一端以及与第二部件第一端相对的第二端；

第二臂；

第二销，其可旋转地附接至第二臂的远端；

第二元件，其从第二销延伸至第二部件的第二端内，该第二元件于第二部件的第二端内是可动地可定位的；

连接第二腿的主体，其将第二臂连接至第二腿；

第二轴，其穿过第二臂某部分而延伸，第二臂可绕第二轴旋转，以致第二臂的远端的运动导致该第二臂绕第二轴旋转并导致该连接第二腿的主体旋转以将第二腿从第二腿的第一位置旋转至第二腿的第二位置；

第一和第二轴杆限定轴心，当桌面从第一位置移至第二位置时该桌面可绕该轴心旋转；

在桌面从桌面的第一位置移至桌面的第二位置期间第一腿部旋转机制的第一部件的第一端旋转，该第一部件的第一端的旋转导致该第一元件于第一部件的第二端内移动，并导致第一销相对第一臂的远端旋转，亦导致第一销运动以驱动第一臂绕第一轴旋转，以致连接第一腿的主体运动以将第一腿从第一腿的第一位置旋转至第一腿的第二位置；而

在桌面从桌面的第一位置移至桌面的第二位置期间，第二腿部旋转机制的第二部件的第一端旋转，该第二部件的第一端的旋转导致该第二元件于第二部件的第二端内移动，并导致第二销相对第二臂的远端旋转，亦导致第二销运动以驱动第二臂绕第二轴旋转，以致连接第二腿的主体运动以将第二腿从第二腿的第一位置旋转至第二腿的第二位置。

22.如权利要求21所述的该件家具，其进一步包含于第一腿和第二腿之间延伸的交叉部件，第一臂定位于交叉部件的第一端内，第二臂定位于与交叉部件第一端相对的交叉部件第二端内，该第一滑架附接至该交叉部件以致该第一臂在第一滑架下方，而该第二滑架附接至该交叉部件以致该第二臂在第二滑架下方。

23.如权利要求20所述的该件家具，其包含连接至第一腿的第一前脚和第一后脚以及连接至第二腿的第二前脚和第二后脚。

24.如权利要求23所述的该件家具，其中当第一和第二腿从其第一位置被移至其第二位置时，第一前脚和第二前脚被远离彼此地移动。

25.如权利要求24所述的该件家具，其中当第一和第二腿从其第一位置被移至其第二位置时，第一后脚和第二后脚被接近彼此地移动。

26.如权利要求22所述的该件家具，其中该第一腿部旋转机制的第一部件还具有中间部件，中间部件于第一腿部旋转机制的第一部件的第一和第二端之间延伸，以致该第一部件是大体上L形的部件、大体上C形的部件、大体上U形的部件或大体上V形的部件；而

其中该第二腿部旋转机制的第二部件还具有中间部件，中间部件于第二腿部旋转机制的第二部件的第一和第二端之间延伸，以致该第二部件是大体上L形的部件、大体上C形的部件、大体上U形的部件或大体上V形的部件。

27.如权利要求26所述的该件家具，其中该第一元件是杆、线性延伸的部件、销或轴杆，而该第二元件是杆、线性延伸的部件、销或轴杆。

28.如权利要求26所述的该件家具，其中该第一轴杆是线性延伸的部件、该第二轴杆是线性延伸的部件。

家具和将该家具排叠的方法

[0001] 相关申请的交叉引用

[0002] 本申请主张于2014年10月23日提交的美国专利申请14/522,047号的优先权,以及于2013年10月28日提交的美国临时专利申请61/896,248号的优先权。

技术领域

[0003] 本发明涉及家具,例如桌子或椅子,以及制造和使用家具的方法。

背景技术

[0004] 桌子和其它家具常常都被配置以具有某数量的腿,其支撑某表面。例如,桌子可具有支撑桌面的腿或支架。又例如,椅子可具有支撑座位的台式基部或腿。这样的家具的例子可从美国专利号D686,856、1,240,390、2,796,307、2,903,312、3,166,029、3,382,820、3,408,965、6,389,988、6,550,402、7,066,098、7,765,938、7,845,290、8,091,488、8,342,462、8,347,796、8,505,186和美国专利申请公开号2010/0044541、2011/0304183、2012/0304902、2012/0306240和2013/0118387得知明白。

[0005] 桌子、椅子和其它家具可在储存时被嵌套或排叠以节省空间。例如,椅子可被配置以彼此上下排叠。又例如,桌子可被配置以彼此上下排叠,或嵌套于其它桌子旁。

[0006] 我们认定需要新的家具设置,以令家具更易于被嵌套或排叠。

发明内容

[0007] 本发明提供了家具。该家具可包括第一结构,其具有第一表面和背对该第一表面的第二表面,其中该第一和第二表面从该第一结构的第一边缘延伸至该第一结构的第二边缘,第一结构的第一边缘和第二边缘相对。该家具亦可包括附接至第一结构的第一倾斜机制,其被配置及尺寸被设置以致该第一结构可从第一位置旋转至第二位置。当该第一结构处于第一位置时该第一结构的第一边缘可处于第一高度,而当该第一结构处于第二位置时该第一结构的第一边缘可处于比第一高度高的第二高度。该家具亦可包括第一腿。该第一腿可以是可从第一位置被移至第二位置的。可以有第一腿部旋转机制附接于该第一腿和该第一倾斜机制之间。当该第一结构从该第一结构的第一位置被旋转至该第一结构的第二位置时,该第一腿部旋转机制可将第一腿从第一腿的第一位置旋转至第一腿的第二位置。

[0008] 在某些实施例中,该件家具可为桌子,如工作桌、餐桌、角几、边桌,或可移动的桌子,其可具有桌面,桌面可用于多种不同活动,如工作相关活动、用餐或其它活动。在其它实施例中,可料到该件家具可以是椅子。

[0009] 在某些实施例中,该件家具可被配置为桌子,该第一结构可以是桌面,而该第一表面可以是平放的表面或者是实质上平放的表面,而该第二表面可以是平放的表面或者实质上平放的表面。实质上平放的表面可以是具轻微上倾或下倾(如1-3度之间的上倾或下倾)的表面,或于表面中的不同部分之间具轻微变化起伏的。

[0010] 该件家具还可包括可从第一位置被移至第二位置的第二腿,以及附接至该第一结

构的第二倾斜机制。第二倾斜机制可被配置及尺寸被设置以致该第一结构可从第一位置旋转至第二位置。第二腿部旋转机制可被附接于该第二腿和该第二倾斜机制之间。当该第一结构从该第一结构的第一位置被旋转至该第一结构的第二位置时，该第二腿部旋转机制可将第二腿从第二腿的第一位置旋转至第二腿的第二位置。该家具还可包括连接至该第一腿的至少一只第一脚以及连接至该第二腿的至少一只第二脚。

[0011] 在该件家具的某些实施例中，该第一倾斜机制可包含定位于第一腿和第一倾斜机制之间的第一滑架。该第一滑架可以是连接至该第一结构的，以致该第一结构可绕水平轴心从第一结构的第一位置旋转至第一结构的第二位置。该第一腿部旋转机制可包含第一部件、第一臂、以及将第一腿部旋转机制连接至第一腿的连接第一腿的主体。该第一部件可具有连接至第一倾斜机制某部分的第一端以及附接至该第一臂的第二端。该第一部件的第一端可以是连接至该第一倾斜机制的，以致当第一结构由第一结构的第一位置被移至第一结构的第二位置时该第一部件移动。该第一部件的移动可导致第一臂移动以驱动该连接第一腿的主体旋转，以致该第一腿被旋转而该至少一只第一脚从第一位置被旋转至第二位置。第二倾斜机制可包括定位于第二腿和第二倾斜机制之间的第二滑架。该第二滑架可以是连接至该第一结构的，以致该第一结构可绕该水平轴心从第一结构的第一位置旋转至第一结构的第二位置。该第二腿部旋转机制可包含第二部件、第二臂、以及将第二腿部旋转机制连接至第二腿的连接第二腿的主体。该第二部件可具有连接至第二倾斜机制某部分的第一端以及附接至该第二臂的第二端。该第二部件的第一端可以是连接至该第二倾斜机制的，以致当第一结构由第一结构的第一位置被移至第一结构的第二位置时该第二部件移动。该第二部件的移动可导致第二臂移动以驱动该连接第二腿的主体旋转，以致该第二腿被旋转，而该至少一只第二脚从第一位置被旋转至第二位置。

[0012] 该第一腿部旋转机制的第一部件可具有多种配置。例如，该第一部件可以是大体上L形的部件、大体上C形的部件、大体上U形的部件或大体上V形的部件。该第二腿部旋转机制的第二部件亦可具有多种配置。例如，该第二部件可以是大体上L形的部件、大体上C形的部件、大体上U形的部件或大体上V形的部件。

[0013] 在某些实施例中，该第一倾斜机制可包含第一连接器部件，以及连接至该第一连接器部件的第一轴杆。该第一轴杆亦可以是连接至第一滑架的，以致该第一连接器部件可绕该第一轴杆旋转。该第二倾斜机制可包含第二连接器部件，以及连接至该第二连接器部件的第二轴杆。该第二轴杆亦可以是连接至第二滑架的，以致该第二连接器部件可绕该第二轴杆旋转。该第一连接器部件可以是附接至该第一结构的该第一表面的，该第二连接器部件亦可以是附接至该第一结构的该第一表面的。该第一和第二连接器部件可以是将第一结构连接至第一和第二倾斜机制的，以允许该第一结构从该第一结构的第一位置被旋转至该第一结构的第二位置。第一和第二轴杆可以是限定第一结构可围绕而旋转的轴心。在某些实施例中，该第一腿部旋转机制的第一部件可从邻接第一连接器部件延伸至邻接第一臂，而该第二腿部旋转机制的第二部件可从邻接第二连接器部件延伸至邻接第二臂。

[0014] 在该件家具的某些实施例中，交叉部件可于第一腿和第二腿之间延伸。第一臂可以是定位于该交叉部件的第一端内的，而第二臂可以是定位于交叉部件的第二端内的，其中交叉部件的第一端和第二端相对。第一滑架可以是被附接至该交叉部件以致第一臂位于第一滑架之下，而第二滑架可以是被附接至该交叉部件以致第二臂位于第二滑架之下。

[0015] 在该件家具的某些实施例中，该第一腿部旋转机制还可包含附接至第一臂远端的第一销，以及从第一销延伸至第一部件的第二端的第一元件，而第二腿部旋转机制还包含附接至第二臂远端的第二销，以及从第二销延伸至第二部件的第二端的第二元件。例如，该第一销可以是可旋转地连接至第一臂的远端的，而该第二销可以是可旋转地连接至第二臂的远端的。作为另一例子，该第一元件可以是可滑动地连接至第一销以及连接至第一部件的第二端的，而该第二元件可以是可滑动地连接至第二销以及连接至第二部件的第二端的。

[0016] 在该件家具的某些实施例中，该第一和第二腿部旋转机制还可以被配置以包括其它元件。例如，该第一腿部旋转机制可以还包含穿过第一臂某部分而延伸的第一轴。该第一臂可以是可绕第一轴旋转的，以致第一臂的远端的运动导致第一臂绕第一轴旋转并驱动连接第一腿的主体旋转。该第二腿部旋转机制还可包含穿过第二臂某部分而延伸的第二轴。第二臂可以是可绕第二轴旋转的，以致第二臂的远端的运动导致第二臂绕第二轴旋转并驱动连接第二腿的主体旋转。

[0017] 应了解，该至少一只第一脚可包含单一只脚或多只脚。例如，该至少一只第一脚可包括第一前脚和第一后脚而该至少一只第二脚可包括第二后脚和第二前脚。该第一前脚可以是处于第一前脚的第二位置而该第二前脚可以是处于第二前脚的第二位置而第一前脚离第二前脚的距离可以是比第一前脚处于第一前脚的第一位置而第二前脚处于第二前脚的第一位置期间较远的。当该第一后脚处于第一后脚的第二位置而第二后脚处于第二后脚的第二位置时，第一后脚离第二后脚的距离可以是比第一后脚处于第一后脚的第一位置而第二后脚处于第二后脚的第一位置期间较近的。第一前脚可以是脚轮、第二前脚可以是脚轮、第三前脚可以是脚轮、第四前脚可以是脚轮。替代地，该第一、第二、第三和第四脚各可为不动的饰钉或不动的与地面接触的结构，其不可在地面上滚动。

[0018] 亦提供了一件家具，其包括：桌面，其具有第一表面以及在第一表面反面的第二表面，该第一和第二表面从该桌面的第一边缘延伸至与该桌面第一边缘相对的该桌面第二边缘。第一倾斜机制附接至该桌面。该第一倾斜机制被配置及尺寸被设置以致该第一桌面可从第一位置旋转至第二位置。当该桌面处于第一位置时该桌面的第一边缘处于第一高度，而当该桌面处于第二位置时该桌面的第二边缘处于第二高度。该第二高度比该第一高度高。第一腿可以是通过附接于第一腿和第一标题机制之间的第一腿部旋转机制附接至第一倾斜机制。该第一腿部旋转机制可以是被附接于第一腿和第一倾斜机制之间的，以致当该桌面从桌面的第一位置被移至桌面的第二位置时，第一腿可从第一位置移至第二位置。第二腿可从第一位置移至第二位置。第二倾斜机制附接至桌面。该第二倾斜机制被配置及尺寸被设置以致桌面可从第一位置旋转至第二位置。第二腿部旋转机制附接于第二腿和第二倾斜机制之间。第二腿部旋转机制被配置以当桌面从第一结构的第一位置被旋转至第一结构的第二位置时将第二腿从第二腿的第一位置旋转至第二腿的第二位置。

[0019] 该第一倾斜机制可包括定位于第一腿和第一倾斜机制之间的第一滑架、附接至桌面的第一表面并可旋转地连接至第一滑架的第一连接器部件，以及附接至第一连接器部件的第一轴杆。该第二倾斜机制可包括定位于第二腿和第二倾斜机制之间的第二滑架、附接至桌面的第一表面并可旋转地连接至第二滑架的第二连接器部件，以及附接至第二连接器部件的第二轴杆。该第一腿部旋转机制可包括：第一部件，其具有连接至第一轴杆的第一端

以及与第一部件第一端相对的第二端;第一臂;第一销,其可旋转地附接至第一臂的远端;第一元件,其从第一销延伸至第一部件的第二端内,以致该第一元件于第一部件的第二端内是可动地可定位的;连接第一腿的主体,其将第一臂连接至第一腿;以及第一轴,其穿过第一臂某部分而延伸。第一臂可以是可绕第一轴旋转的,以致第一臂的远端的运动导致该第一臂绕第一轴旋转并导致该连接第一腿的主体运动以将第一腿从第一腿的第一位置旋转至第一腿的第二位置。该第二腿部旋转机制可包括:第二部件,其具有连接至第二轴杆的第一端以及与第二部件第一端相对的第二端;第二臂;第二销,其可旋转地附接至第二臂的远端;第二元件,其从第二销延伸至第二部件的第二端内,以致该第二元件于第二部件的第二端内是可动地可定位的;连接第二腿的主体,其将第二臂连接至第二腿;以及第二轴,其穿过第二臂某部分而延伸。第二臂可以是可绕第二轴旋转的,以致第二臂的远端的运动导致该第二臂绕第二轴旋转并导致该连接第二腿的主体旋转以将第二腿从第二腿的第一位置旋转至第二腿的第二位置。第一和第二轴杆可限定轴心,其中当桌面从第一位置移至第二位置时该桌面可绕该轴心旋转。在桌面从桌面的第一位置移至桌面的第二位置期间第一腿部旋转机制的第一部件的第一端可旋转,以致该第一部件的第一端的旋转导致该第一元件于第一部件的第二端内移动,并导致第一销相对第一臂的远端旋转,亦导致第一销运动以驱动第一臂绕第一轴旋转,以致连接第一腿的主体运动以将第一腿从第一腿的第一位置旋转至第一腿的第二位置。在桌面从桌面的第一位置移至桌面的第二位置期间,第二腿部旋转机制的第二部件的第一端可旋转。该第二部件的第一端的旋转可导致该第二元件于第二部件的第二端内移动,并导致第二销相对第二臂的远端旋转,亦导致第二销运动以驱动第二臂绕第二轴旋转,以致连接第二腿的主体运动以将第二腿从第二腿的第一位置旋转至第二腿的第二位置。

[0020] 交叉部件可于第一腿和第二腿之间延伸。第一臂可以是定位于交叉部件的第一端内,而第二臂可以是定位于与交叉部件第一端相对的交叉部件第二端内。该第一滑架可以是附接至该交叉部件的,以致该第一臂在第一滑架下方,而该第二滑架可以是附接至该交叉部件的,以致该第二臂在第二滑架下方。

[0021] 该件家具的实施例可包括连接至第一腿的第一前脚和第一后脚以及连接至第二腿的第二前脚和第二后脚。当第一和第二腿从其第一位置被移至其第二位置时,第一前脚和第二前脚可以是被远离彼此地移动。当第一和第二腿从其第一位置被移至其第二位置时,第一后脚和第二后脚可以是被接近彼此地移动。

[0022] 在某些实施方案中,该第一腿部旋转机制的第一部件还具有中间部件,中间部件于第一腿部旋转机制的第一部件的第一和第二端之间延伸,以致该第一部件是大体上L形的部件、大体上C形的部件、大体上U形的部件或大体上V形的部件。该第二腿部旋转机制的第二部件可具有中间部件,中间部件于第二腿部旋转机制的第二部件的第一和第二端之间延伸,以致该第二部件是大体上L形的部件、大体上C形的部件、大体上U形的部件或大体上V形的部件。

[0023] 在某些实施例中,该第一元件是杆、销、线性延伸的部件,或轴杆,而该第二元件是杆、销、线性延伸的部件,或轴杆。此外,该第一轴杆可以是杆或其它类型的线性延伸的部件,而该第二轴杆可以是杆或其它类型的线性延伸的部件。

[0024] 亦提供了排叠桌子的方法。该方法可包括提供多张桌子。每张桌子可为如上所述

的或如下更全面地讨论的一件家具。该方法还可包括将每张桌子的第一结构从第一位置移至第二位置的步骤，以致第一腿亦从第一腿的第一位置移至第一腿的第二位置。随后可将桌子彼此邻接地嵌套，以将该些桌子排叠。

[0025] 随着以下对本发明的某些示例性实施例以及对执行该发明的某些示例性方法进行说明，本发明的其它细节、目的和优点将变得清晰。

附图说明

[0026] 附图示出家具的示例性实施例，亦示出了某些实现该些家具的示例性方法。应了解，附图中相同的参照标号可用于识别类似的构件。

[0027] 图1是家具的第一示例性实施例的透视图，其中该家具处于第一位置，其中该桌面的一表面实质上是平放或实质上是水平的，而该家具的腿处于第一位置。

[0028] 图2是该家具第一示例性实施例处于第一位置的侧视图。

[0029] 图3是该家具的第一示例性实施例处于第二位置的俯视图，在该位置该桌面被倾斜以至实质上垂直，而家具的腿处于第二位置，以致前脚彼此之间相隔得相比后脚之间的空间相隔更远。

[0030] 图4是该家具的第一示例性实施例处于第二位置的透视图。

[0031] 图5是该家具的第一示例性实施例处于第二位置的侧视图。

[0032] 图6是该家具的第一示例性实施例处于第二位置的后视图。

[0033] 图7是该家具的第一示例性实施例处于第二位置的后视透视图。

[0034] 图8是该家具的第一示例性实施例处于第一位置的仰视透视图。

[0035] 图9是该家具的第一示例性实施例处于第一位置的仰视图。

[0036] 图10是该家具的第一示例性实施例处于第二位置的仰视图。

[0037] 图11是该家具的第一示例性实施例的局部图，其中将腿部旋转机制和交叉部件的某些部分截去了以在家具处于第二位置期间描示该家具的第一示例性实施例的该腿部旋转机制、桌面倾斜机制和闩机制的部分。

[0038] 图12是该家具的第一示例性实施例处于第二位置的底部局部图，其中将该家具的第一示例性实施例的该腿部旋转机制、桌面倾斜机制和闩机制的部分以虚影示出，以描示这些元件的组成部分。

[0039] 图13是一组排叠了的家具第一示例性实施例的透视图，该些家具处于第二位置，被嵌套了在一起以作收藏。

具体实施方式

[0040] 家具1可被配置为桌子。该桌子可包括基部2，其具有附接至各自的腿5的脚3。每条腿5可从其附接至的一只或多只脚3垂直地延伸至与桌面7的底部表面相邻。腿5可为一些部件，其由金属、聚合物料、复合物料、木或以上的某组合构成。每条腿5可被附接至连接结构，例如将一只或多只脚3连接至该腿5的脚部支撑部件或支架。该些脚3可包括前脚3a和后脚3b。在某些实施例中，该些前脚3a可被配置为邻近桌子前侧的该家具的第一和第二侧的第一组脚，而后脚3b可被视为邻近桌子后侧的该家具的第一和第二侧的第二组脚。

[0041] 该些脚3可包括脚轮或与地面接触的元件。例如，该些脚3可各为脚轮或滚轮，以致

该些家具可易于在地面或其它表面上滚动以作收藏，并随后将该些家具移进某房间并将该些家具置成其第一位置，以供会议用，或某项目或某工作环境中使用。

[0042] 当该家具处于第一位置时，桌面7的上表面7a可为平放或实质上平放的。例如，该桌面的第一边缘7c可处于和桌面7的第二边缘7d一样的高度。背对的底部表面7b亦可为平放或实质上平放的。作为另一例子，当该家具处于第一位置时，该上表面和底部表面7a和7b可被定位以限定水平或实质上水平(例如具1-5度角下倾或上倾)的表面。当该家具被移至第二位置时，该桌面7可以是倾斜了以致该上表面是实质上垂直地从该第一边缘7c延伸至该第二边缘7d(例如相对水平成45度或更大的角度、相对水平成70度的角度、相对水平成85-90度之间的角度，等等)或者相对桌面7处于第一位置时桌面7的上表面7a的上倾或下倾角度为更陡斜地上倾或下倾。因此，当该家具1是处于第二位置时，该第二边缘7d可以是处于比第一边缘7c较高的高度。

[0043] 应了解的是，在该家具1处于第二位置时，桌面7的第一和第二边缘7c和7d之间的高度的不同可以是远大于当家具1处于第一位置期间的。例如，在处于第一位置时，该第一和第二边缘7c和7d可以是在同一高度或接近同一高度，以致两者的高度分别为零或接近零。作为对比，当该家具是处于第二位置时，该第二边缘7d的高度可为大大地高于第一边缘7c的高度(例如20cm或更多、30cm或更多、至少一米、两米或更多、20cm和两米之间，等等

[0044] 当该家具1从该第一位置被移至该第二位置时，该桌面7便如上所述、如图所示，和如下详述地那般从第一位置被移至第二位置。同时，该基部的腿5和脚3亦从第一位置被移至第二位置。在腿5和脚3的第一位置中，该些脚彼此之间的距离可为一样的。例如，当该家具处于第一位置，腿5和脚3也处于第一位置时，前脚3a可以是以空间S1分隔，而后脚3b可以是以空间S2分隔。空间S1的距离可以是和空间S2的距离相等或接近相等(例如彼此分别为2.5cm和9cm之内)。当该家具处于第二位置，腿5和脚3也处于第二位置时，前脚3a可以是以空间S3分隔，其大于空间S1的距离；而后脚3b可以是以空间S4分隔，其比空间S2的距离较窄；这样，前脚3a在第一位置时比在第二位置时彼此较接近，而后脚3b在第二位置时比在在第一位置时彼此较接近。亦设想到家具1的替代实施例可以被配置以致腿5和脚3从第一位置被移至第二位置时导致后脚3b的间隔是在第二位置期间相比在第一位置期间彼此较接近，而前脚3a在第二位置期间相比在第一位置期间是彼此间隔较远。

[0045] 该家具1可被配置以采用调校机制以将桌面7、腿5和脚3于第一和第二位置之间致动，以致桌面、腿5和脚3可从其第一位置被移至其第二位置并随后从其第二位置被移至其第一位置。该调校机制可包括至少一个用于旋转或扭动腿5和脚3的腿部旋转机制13、至少一个用于将桌面7倾斜的倾斜机制14，以及至少一个闩机制15，其用于可释放地将桌面7锁定于第一位置，以避免桌面7、腿5和脚3意外地从其第一位置移至其第二位置。

[0046] 该闩机制15可包括可滑动的手柄或可移动的手柄部件，其由一个或多个弹性元件偏压至锁定位置；弹性元件例如为螺旋弹簧或弹性体构成的实体弹性件，其与该手柄啮合并将该手柄偏压至该锁定位置。使用者可按动手柄或以其它方式操作手柄，通过使手柄以该由一个或多个弹性元件所施加的偏压力方向相反的方向移动，将手柄移至解锁位置。当手柄被移至该解锁位置，桌面7便从桌子的基部2解闩，并可从该第一位置倾斜至该第二位置。例如，该手柄的移动可引致某凸出物或可锁定部件从与某闩部件15a接触或锁定啮合的位置滑出以致可倾斜桌面7，其中该闩部件15a可以是限定一开口，其用于接收该凸出物或

可锁定部件和可释放地与其锁定。

[0047] 该倾斜机制14可包括多个连接器部件11，其附接至桌面7的底部表面7b，并且可通过该闩机制15可释放地附接至该家具1的基部2的交叉部件9。每个连接器部件11可以被连接至一个闩机制15，以致必须将多个闩机制移至解锁位置才能将该些连接器部件11从交叉部件9释放。替代地，可以只有一个连接器部件11具有闩机制，其将该连接器部件11锁定至交叉部件和将其从其解锁以允许桌面7倾斜。附接至该连接器部件11的该闩机制可以是将连接器部件11可释放地连接至该交叉部件9的元件。因此，在家具1的实施例中，每个连接器部件11或唯一的连接器部件11可以是可释放地连接至该交叉部件9。

[0048] 每个连接器部件11可以是矩形结构、梁、棒、杆，或其它于桌面的底部表面7b的某部分下延伸，或者是附接至桌面的底部表面7b的结构。每个附接至闩机制15的连接器部件11可限定沟道或开口，其用于容纳该闩机制的可滑动手柄。该闩机制的一个或多个弹性偏压元件亦可被容纳于该连接器部件11内，并可于该连接器部件内移动(例如可滑动)以响应使用者提供用以移动该可滑动手柄的力量而移动；其中该可滑动手柄可以包括耦合至该至少一个弹性偏压元件(例如螺旋弹簧)的部件。可互锁元件亦可被容纳于该连接器部件11中，该可互锁元件是连接至该可移动手柄并被配置以由从闩部件15a锁定的位置和解锁的位置被移动，并可于该连接器部件11内从锁定位置移动以及从第二位置移动，在锁定位置中该互锁元件接触或以其它方式啮合闩部件15a，在第二位置中该互锁元件是离开该闩部件15a或与其脱离啮合，以允许该连接器部件11相对于该交叉部件9绕某旋转轴心旋转。该闩部件15a可以是与滑架10一体的构件，滑架10附接至交叉部件9；或者可以是附接至该滑架10的闩部件15a，其以一个或多个紧固件(如螺钉、螺栓)、另类的紧固机制(如一个或多个焊接的接点)或这些紧固机制的某组合附接至交叉部件9。

[0049] 该倾斜机制14可以是被配置以允许该桌面7绕某水平轴心旋转，以致该桌面7相对于该交叉部件9是可垂直倾斜和移动的。每个倾斜机制14可被附接于该连接器部件11和该交叉部件9之间，以将连接器部件11连接至交叉部件9。每个连接器部件11可以被附接至各自的倾斜机制14。替代地，一个倾斜机制14可被附接至所有连接器部件11，以可动地将该些连接器部件11连接至该交叉部件9。

[0050] 如图11-12最清楚示出的，每个倾斜机制14可包括轴杆18，其穿过连接器部件11中的洞延伸，亦穿过附接至交叉部件9的滑架10的部分中的洞延伸。该轴杆18可以是销、杆、梁、部件，或其它限定某水平轴的元件，其中当闩机制15被移至解锁位置时该连接器部件11可绕该水平轴旋转，以致该连接器部件11可绕轴杆18以第一方向移动和以相反的第二方向移动，如箭头A所示。在某些实施例中，在连接器部件11绕轴杆18所限定的轴转动时，该轴杆18可旋转。在某些实施例中，可将阻尼器51(例如气动弹簧、油压弹簧或其它阻尼器元件)附接于滑架10和连接器部件11之间，阻尼器51于图11中以虚线示出。阻尼器51可被配置以帮助在连接部件11绕轴杆18旋转时调节桌面7可旋转的速度。在某些其它实施例中，可替代或额外附加于被附接于滑架10和连接器部件11之间的阻尼器51而把(替代或额外的)阻尼器51附接于滑架10和桌面7之间、交叉部件9和桌面7之间，或交叉部件9和连接器部件11之间。

[0051] 每个腿部旋转机制13可被附接于各自的腿5和连接器部件11或倾斜机制14之间，以致将桌面7从其第一位置旋转至其第二位置亦会导致将腿5和脚3从其第一位置旋转至其第二位置。例如，该家具1的实施例可包括邻接桌面7相对侧的两腿5，并包括两个腿部旋转

机制13、附接至第一腿的第一腿部旋转机制以及附接至和第一腿相对的第二腿的第二腿部旋转机制。在某些实施例中，每个腿部旋转机制可被附接至相应的连接器部件11，以用于附接至倾斜机制14的相应构件。在其它实施例中，多个腿部旋转机制13可被附接至同一交叉部件9的相对端，以用于附接至倾斜机制14的同一构件。

[0052] 每个腿部旋转机制13可包括第一杆20，其定位于连接器部件11内或附接至连接器部件11。该第一杆20可为杆、销或其它类型的直线延伸的长形部件(例如轴杆)。弯曲的L形部件21的第一端21a可被附接至该第一杆20，并可为可旋转地被附接，以致其可绕该第一杆20旋转；或其可为不可动地被固定至该第一杆20。如是可旋转地被附接至该第一杆20，该L形部件21的第一端21a则可以是可绕第一杆20以两相反方向旋转，如箭头G所示。该L形部件被视为是L形的，因为其大体上是L形的，因为其具有弯曲的“L”类形状。替代地，该L形部件可被配置为大体上V形的部件、大体上U形的部件、大体上C形的部件，或其它弯曲的部件或多边形的部件。该L形部件21可以是不可动地固定或可旋转地附接至该第一杆20，该杆则可以是附接至该连接器部件11并定位于其内。该L形部件21从其第一端21a延伸至其第二端21b。该L形部件21的一中间部分21c处于该第一和第二端21a和21b之间，并穿过交叉部件9中的一开口。L形部件21的第二端21b是定位于交叉部件9内的，并附接至第二杆22。第二杆22可为杆、销或其它类型的线性延伸的长形元件(如轴杆)，其从该L形部件的第二端21b延伸至销23。该第二杆可以是可旋转地附接至该L形部件21的第二端21b，以致该第二端21b可绕该第二杆22旋转。例如，该第二端21b可以是可绕该第二杆22以两不同相反的方向旋转，如图11中箭头B所示。因此，该第二杆22可作为轴作用，其中该L形部件21的第二端21b是可沿该轴杆旋转的。

[0053] 该第二杆22的第一端部部分可被定位于在L形部件21的第二端21b中形成的开口内。该第二杆22可穿过该第二杆22穿过而延伸的该L形部件的第二端21b的开口而被定位。该第二杆22可以是可滑动穿过该L形部件21的第二端21b的这开口的。已设想该第二杆22的第一端部部分的终端可具有头部或加大的维度，其能防止该第一端从该L形部件的第二端21b的开口滑出。该第二杆可以是可以两相反的方向滑动，如图11-12中箭头E所示。该第二杆22的与其第一端部部分相对的第二端部部分可穿过于销23中形成的开口延伸。在该家具的某些实施例中，第二杆22的该第二端部部分可以是被不可动地附接至该销23的。

[0054] 该销23是附接至从腿5延伸的可旋转的臂25。例如，该臂25可从连接腿的主体24延伸，后者于腿5和臂25之间被附接至腿5。替代地，该臂25可直接从腿5延伸并可具有直接附接至腿5的端部。该销23可以是旋转地附接至臂25的一远端，以致该销在附接至臂25的同时可于如箭头F所示的两相反方向转动。臂25可被旋转地附接至销23的底部部分，而销23的上部部分限定用于接收该第二销22的第二端的开口。臂25是附接至销23的，以致该L形部件21的第二端21b的前后移动(如图1中箭头C所示)亦导致臂25的远端前后移动，并驱动该臂绕附接至交叉部件9的圆柱形元件27如箭头D所示般旋转运动。在臂25的旋转运动期间，销23可如箭头F所示般旋转，而第二杆22的部分可如箭头E所示般滑动穿过该L形部件的第二端21b的开口。

[0055] 臂25定位于该交叉部件9内，以致臂25可于交叉部件9内移动。臂25于其内限定了通道，大体上圆柱形的元件27穿过该通道。该圆柱形元件27可限定垂直的轴，臂25可绕其以两相反方向旋转，如图11中箭头D所示。臂25的一近端附接至连接腿的主体24，其附接至腿5

的上部部分，以致当臂25绕圆柱形元件27所限定的轴旋转时，连接腿的主体24和其附接的腿5以和臂25旋转的相同方向旋转。

[0056] 该臂25可以是一体地连接至腿5，这可以是通过焊接，或通过作为同时限定臂25和连接腿的主体24的铸造结构而达成。替代地，臂25可通过一个或多个紧固件、紧固机制或焊接和紧固件的组合而固定至该连接腿的主体24，紧固件或紧固机制例如为螺栓和螺钉。连接腿的主体24可通过一个或多个紧固件被附接至腿5的上端。替代地，该连接腿的主体24可以是与腿5的上端一体的，这是通过在模制或铸造该腿时将该连接腿的主体24形成在腿的上端上，或将其焊接或结合至腿5的上端上。

[0057] 应了解，每条腿5皆可被附接至各自的腿部旋转机制13。每个各自的腿部旋转机制13皆可被附接至各自的连接器部件11并各自被附接至交叉部件9相应的一端部或一侧，或被定位于交叉部件9相应的一端部或一侧内。替代地，各个腿部旋转机制13可被附接至相同的连接器部件11。

[0058] 该交叉部件9可为多边形的棒或梁，或可被设定尺寸和配置作为杆或其它结构。当桌面7处于第一位置时，该交叉部件9可在桌面7的底部表面7b下的两相对的腿5之间延伸。一上沟道可被限定于该交叉部件中，以接收一个或多个滑架10，以及提供导管用于整理电线(例如电子产品的供电线、以太网线、其它线路等)。该交叉部件的每端可被配置以将各自的滑架10保留或接收，以将交叉部件9附接至相应的连接器部件11。每个滑架10可被配置以和限定于交叉部件的上部部分上的顶部型材互锁。附加地或替代地，可通过一个或多个如螺栓、螺钉、焊接的紧固件或紧固机制，或这些紧固机制的某组合将该滑架紧固至该交叉部件。交叉部件的每端亦可具有下部空间、下部范围、下部隔室，或处于上沟道下方的部分的下部沟道，其具有开放的容积，其尺寸和形状被设定以接收部分的圆柱形元件27、L形部件21的第二端21b、第二杆22、销23和臂25。

[0059] 该家具的实施例被配置以致将桌面7从其第一位置提起至其第二位置亦自动将腿5和脚3调校至其第二位置，以致该家具被配置以将桌子以嵌套的布置收藏，其中多件其它家具全以同样布置定位，如例如图13所示。这样的配置可允许该些家具全被置于第二位置中并被收藏或在其它情况下以嵌套的、小巧的布置排叠，以致可节省地面空间地储存该些家具。当需要将该些家具用于项目或工作用途时，就可将该些家具从其排叠嵌套的布置移出、移至期望的位置，并从其第二位置调校至其第一位置。应了解，对于这样的实施例而言，桌子的排叠可以是嵌套的桌子的横向排叠。

[0060] 例如，将桌面从其第一位置提起至其第二位置可导致该些交叉部件11绕轴杆18旋转，亦可导致该些L形部件连接至该些第一杆20的该些第一端21a旋转或以其它方式移动，以致该些L形部件21的该些第二端21b于交叉部件9内向前移动，这驱动该些臂25的远端的向前移动，以致该些臂25绕该些圆柱形元件27旋转并引致该些连接腿的主体24及与其附接的该些腿5旋转或扭动。每条臂25是由其通过第二杆22和销23连接至的L形部件21向前的移动驱动。在该些L形部件向前移动期间，附接至该些L形部件21的该些第二杆22穿过该些L形部件的该些第二端21b中的开口滑动往该些臂25，而当该些L形部件被向前移动、该些第二杆22滑动期间，该些销23旋转。该些销23的旋转和该些第二杆22的滑动和向前移动以及该些L形部件21的向前移动协作以驱动该些臂25旋转。当该些腿部旋转机制13的每个销23连接至的L形部件被向前移动时，该些销23可逆时针旋转，而该些第二杆22各皆可往其附接至

的销23被滑动。在其它实施例中，该销23可被配置以在其附接至的L形部件被向前移动时以顺时针方向旋转。

[0061] 将桌面7从其第一位置倾斜至其第二位置所导致的该些腿5的旋转或扭动导致该些脚3移动以致前脚3a远离彼此地移动而后状举3b彼此靠近地移动。当桌面7从其第二位置被倾斜至其第一位置时，该些交叉部件11绕轴杆18旋转并导致该些L形部件21的第一端21a旋转或以其它方式移动，以致该些L形部件的第二端21b向后移动。该些L形部件的第二端21b的向后移动导致该些臂25的远端向后移动，并导致该些臂25和该些连接腿的主体24发生旋转，以致该些腿5被旋转往其第一位置而脚3被旋转至其第一位置。在L形部件向后移动期间，该些第二杆22亦穿过该些L形部件的第二端21b的开口以离开该些第二杆22各自附接至的销23的方向滑动。在该些L形部件21的第二端21b向后移动期间，该些销23亦旋转和向后移动，以致在该些L形部件21向后移动期间，该些销23附接至的臂25绕该些圆柱形元件27限定的轴被旋转，旋转方向和该些L形部件21的第二端21b被向前移动期间该些臂被旋转的方向是相反的。当从该些前脚3a的第二位置移往其第一位置期间，该些前脚3a彼此靠近地移动。当从该些后脚3b的第二位置移往其第一位置期间，该些后脚3b彼此远离地移动。

[0062] 可提供该家具的多个实施例。例如，可提供实施该家具的多张桌子。每张桌子的桌面7皆可被移至第二位置，以致桌子的该些脚和该些腿被移至其第二位置。此后，可将桌子排成一列并嵌套在一起，以致邻接的桌子与其它桌子以一列嵌套。例如，第一张桌子可与第二张桌子嵌套，以致该第一张桌子的后脚3b于第二张桌子的腿之间于第二张桌子的桌面下延伸。移至第二位置的第三张桌子可随后与处于第二位置的第拳头桌子嵌套，以致第三张桌子的后脚3b于第一张桌子的腿之间于第一张桌子的桌面下延伸。

[0063] 应了解，可对该家具作改变，以形成本发明的家具的实施例。例如，可将倾斜机制14连接至多个连接器部件11，但可将闩机制15只连接至一个连接器部件11以将桌面7锁定和解锁，以将桌面7倾斜。作为另一例子，该些腿部旋转机制13可各被连接至各自的壳体而不是交叉部件9。每个壳体可被定位至邻接各自的腿和各自的连接器部件11，以将该腿部旋转机制连接于各自的腿5和桌面7之间。这样，该些壳体可代替滑架10和交叉部件9。作为又一例子，该些L形部件21可以具不同形状的部件代替、以枢转地连接在一起的互连的联动件代替，或以缆线设置代替。

[0064] 作为又一例子，本家具的实施例可为椅子，并可就椅子的腿被配置以供使用，以促成椅子的收藏或储藏。这样的设置可适用于例如客座设置。对于这样的实施例，该些桌面7会是不同的结构，例如为椅子的座位，而腿5可为椅子的腿。该倾斜机制14、闩机制15和腿部旋转机制13各可被附接于椅子的座位和其腿之间。一个或多个连接器部件11可被连接至椅子处于就座位置时该座位的底部表面，以连接椅子的座位和腿之间的倾斜机制14、闩机制15和腿部旋转机制13。

[0065] 作为又一例子，每条腿5可为将椅子多条腿的或桌子的多条腿连接至腿部旋转机制的部件，以用于将桌子或椅子的该些腿旋转。作为又一例子，该交叉部件9可以是从单一的梁形成，或可从多个梁元件组成，它们被紧固在一起以组成该交叉部件。作为又一例子，家具可具有多组的腿和多组的交叉部件，以致各自的交叉部件被连接于各自的一组腿之间。

[0066] 因此应了解，虽然在本文中讨论和描示了家具的某些示例性实施例以及制造和使

用该些实施例的方法，但应清楚了解的是本发明并不受限于此，而是可以其它多种方式于权利要求的范围中被实施。

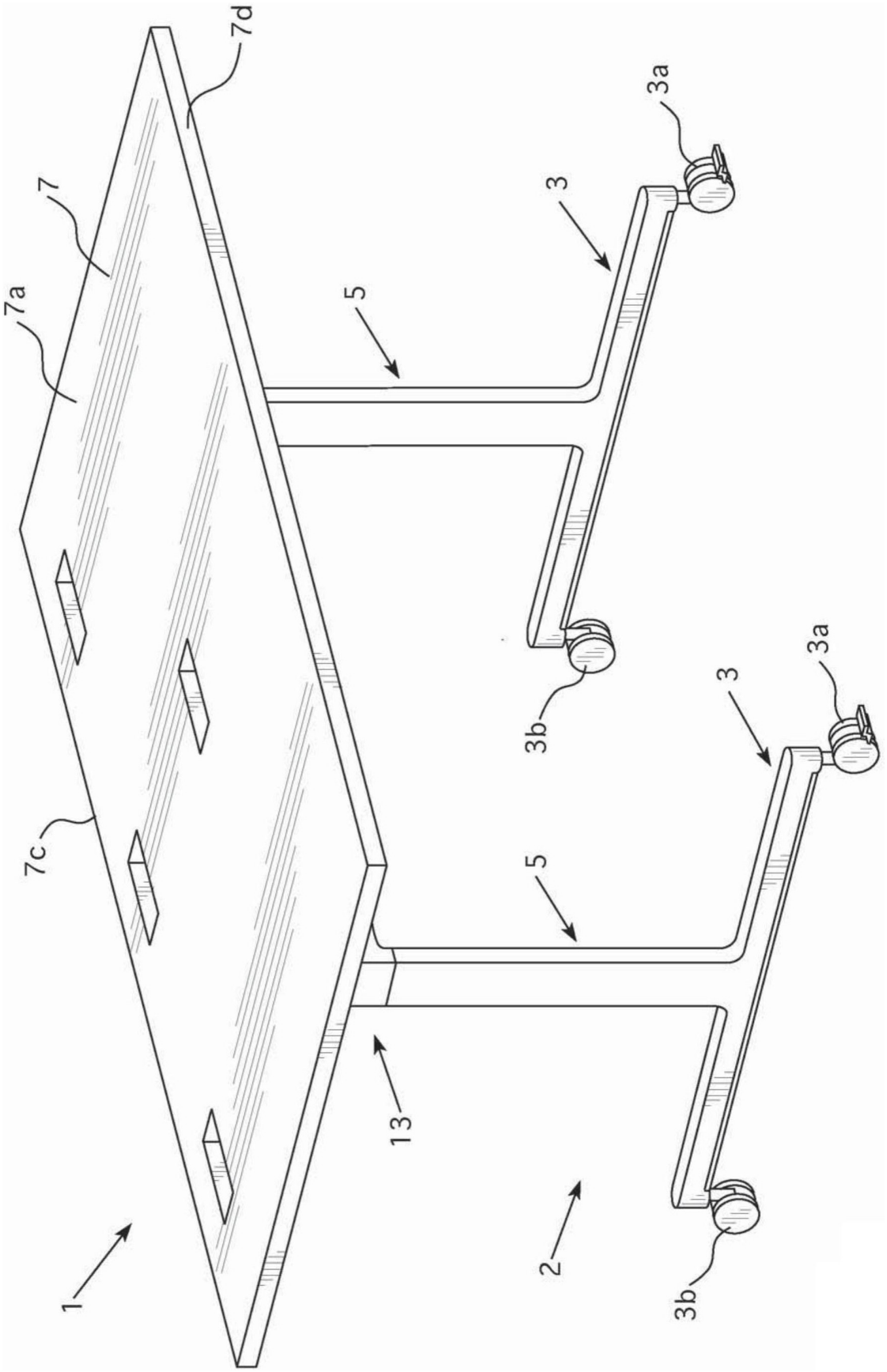


图1

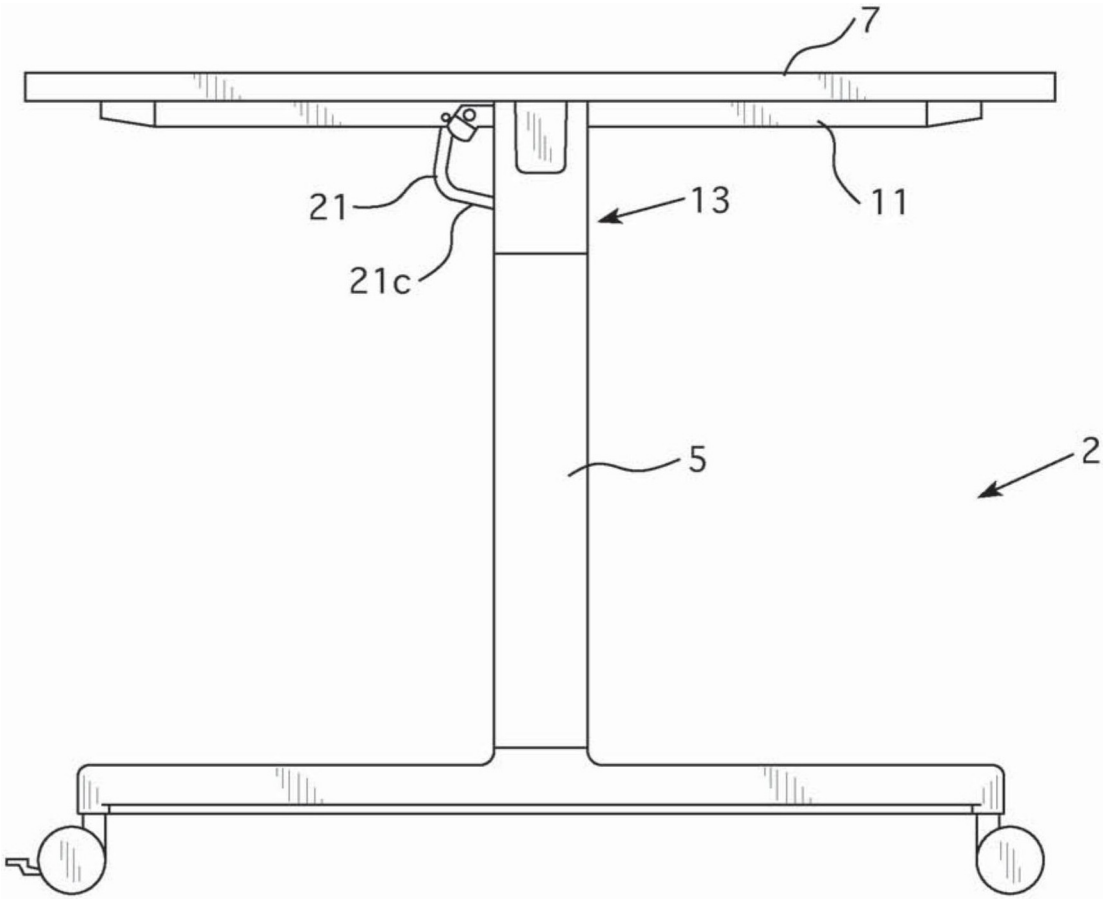


图2

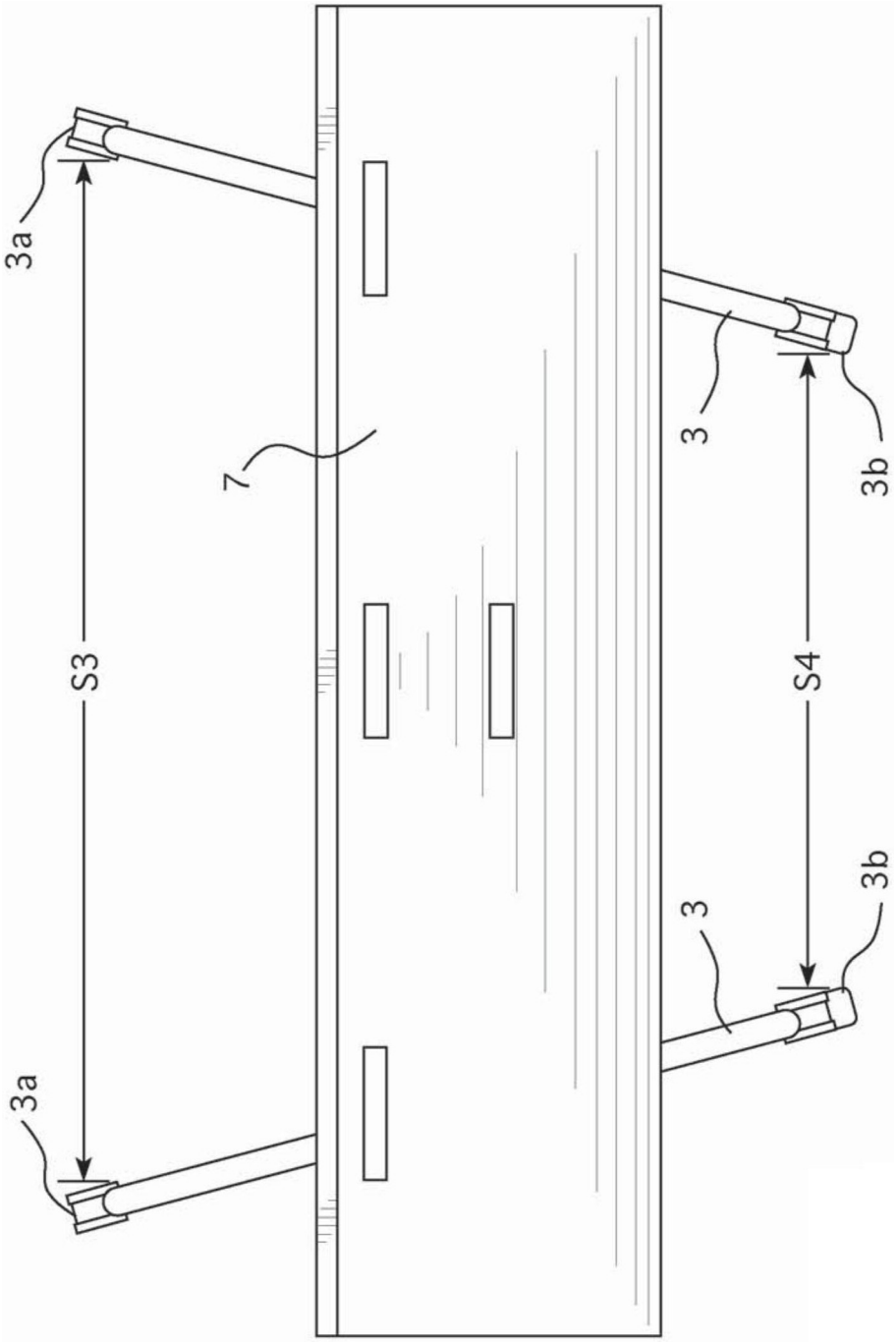


图3

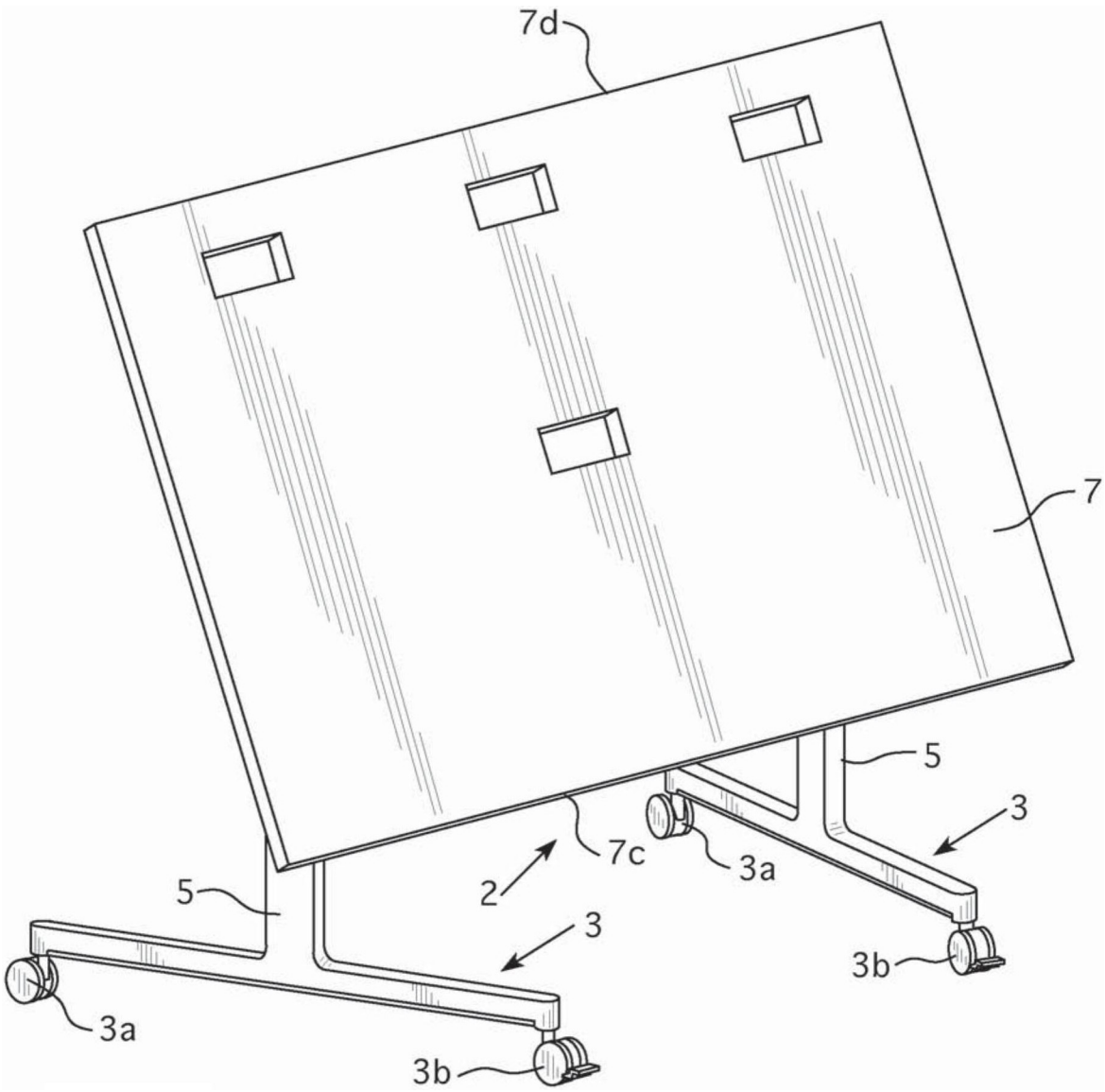


图4

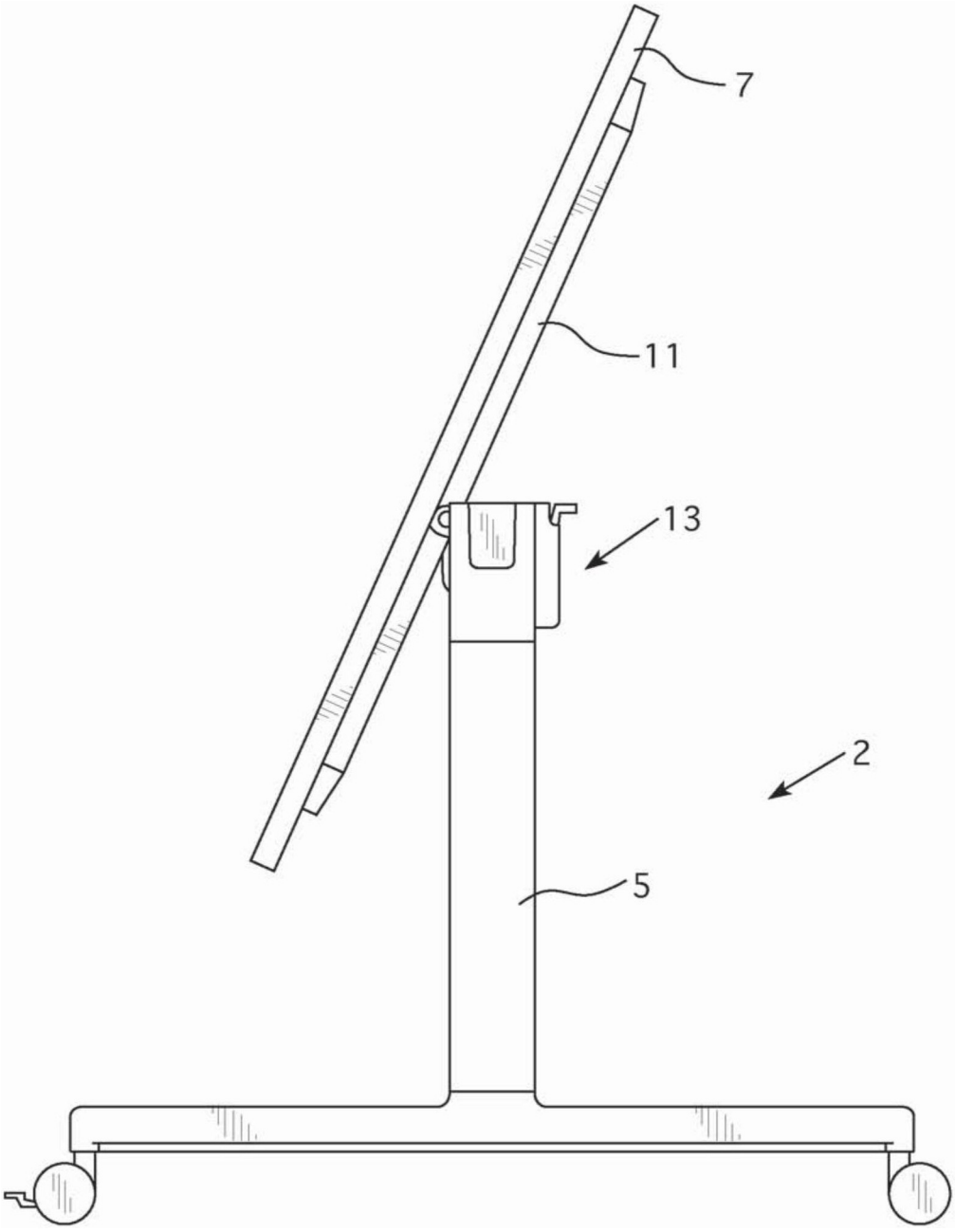


图5

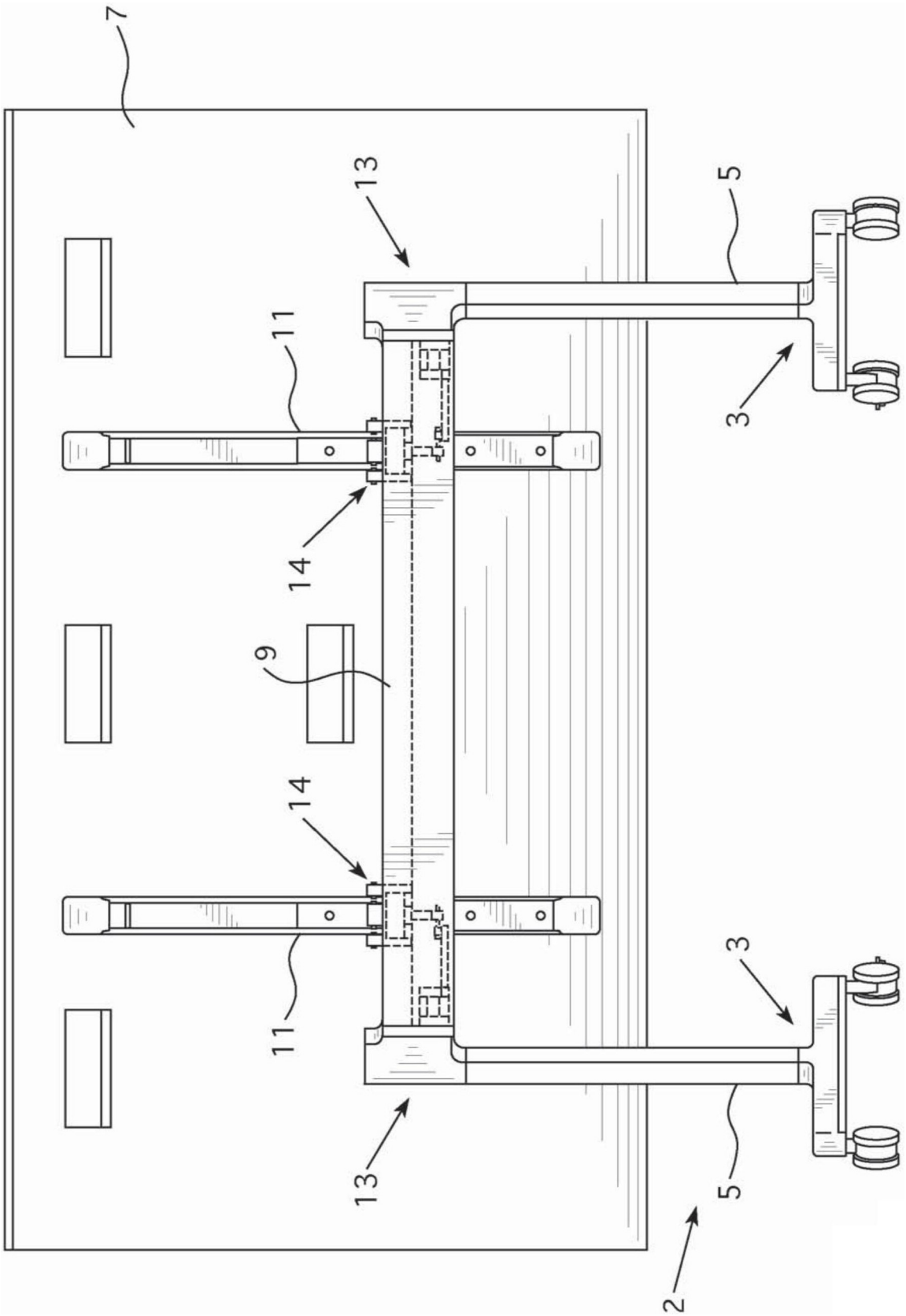


图6

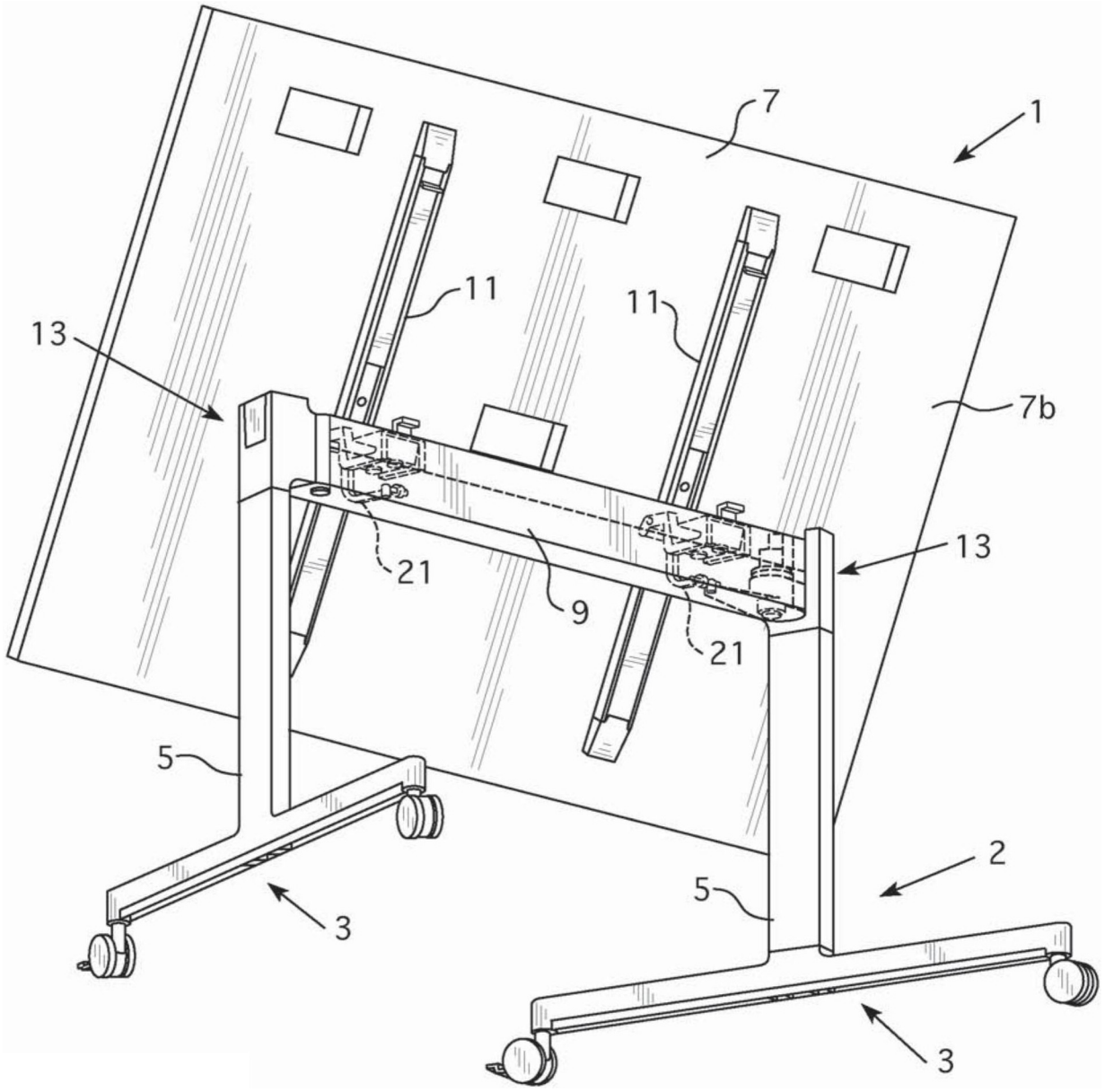


图7

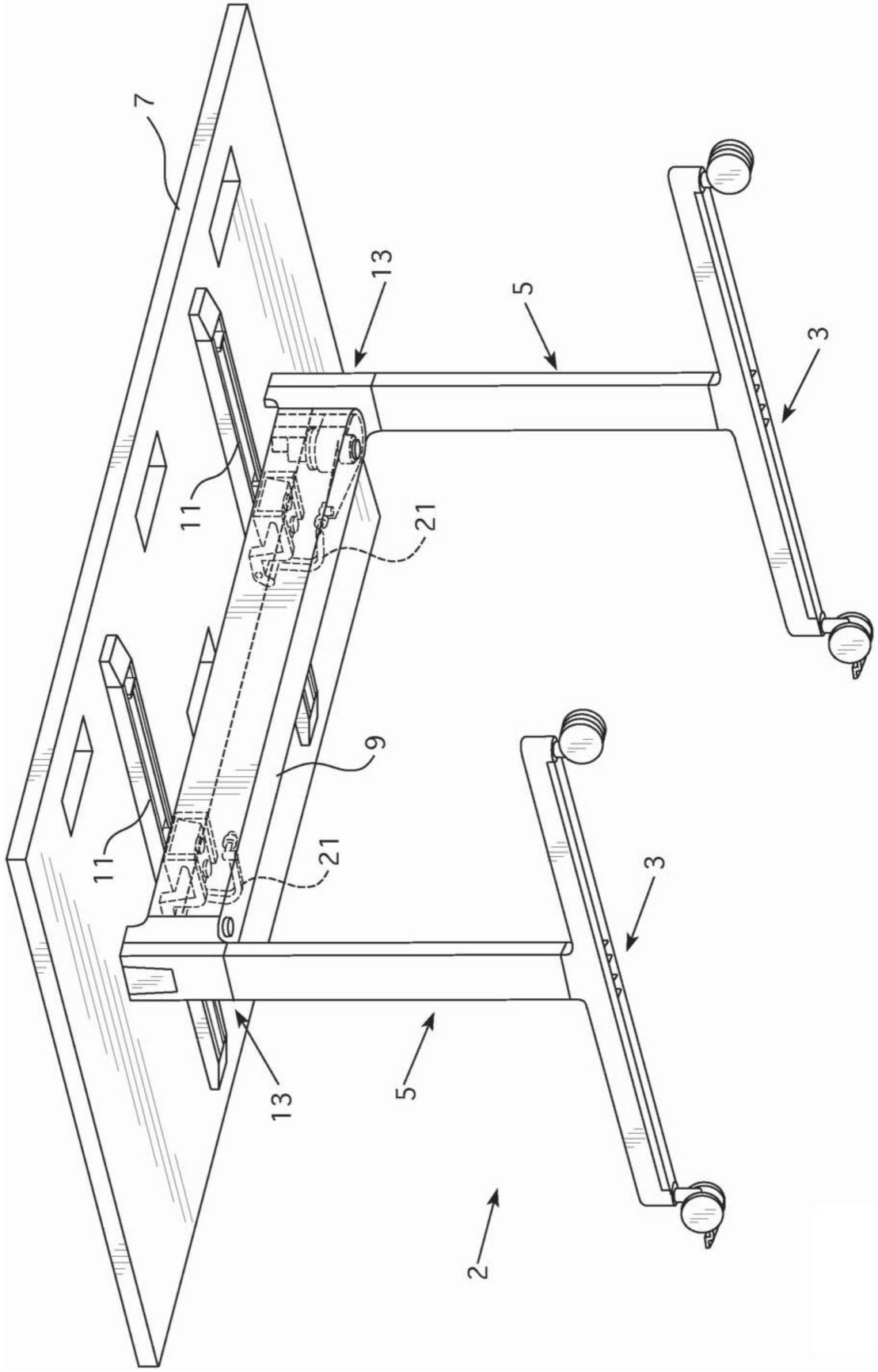


图8

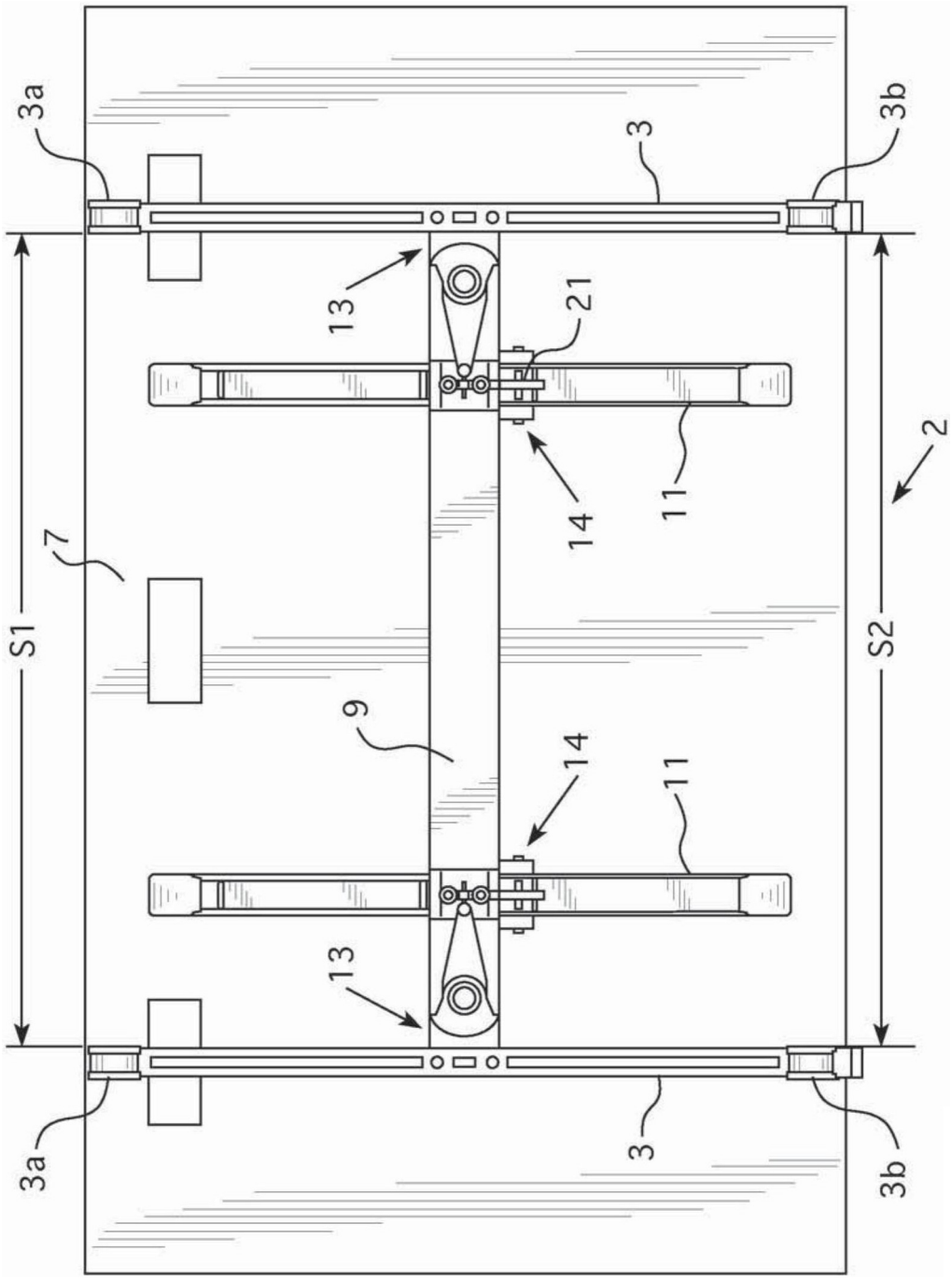


图9

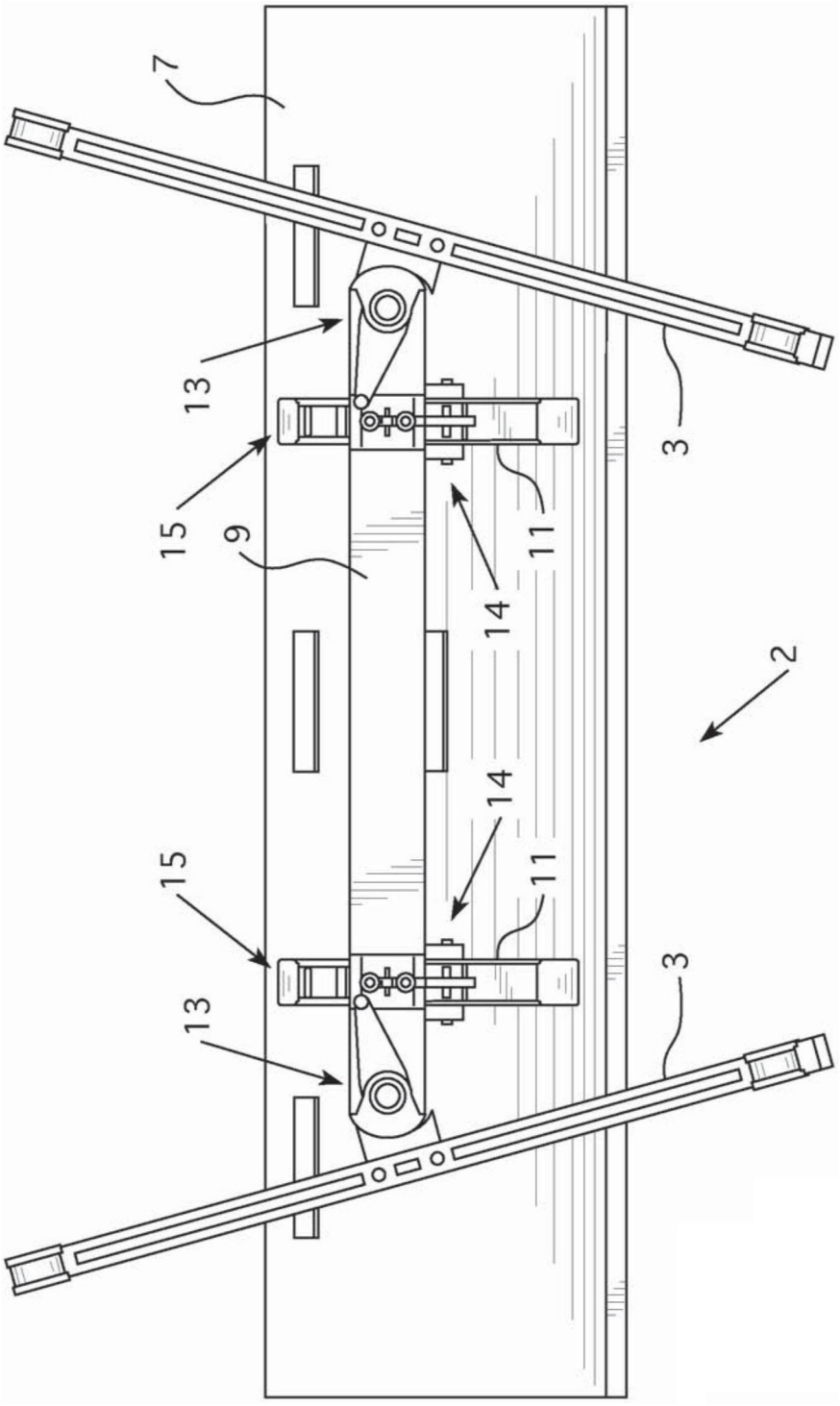


图10

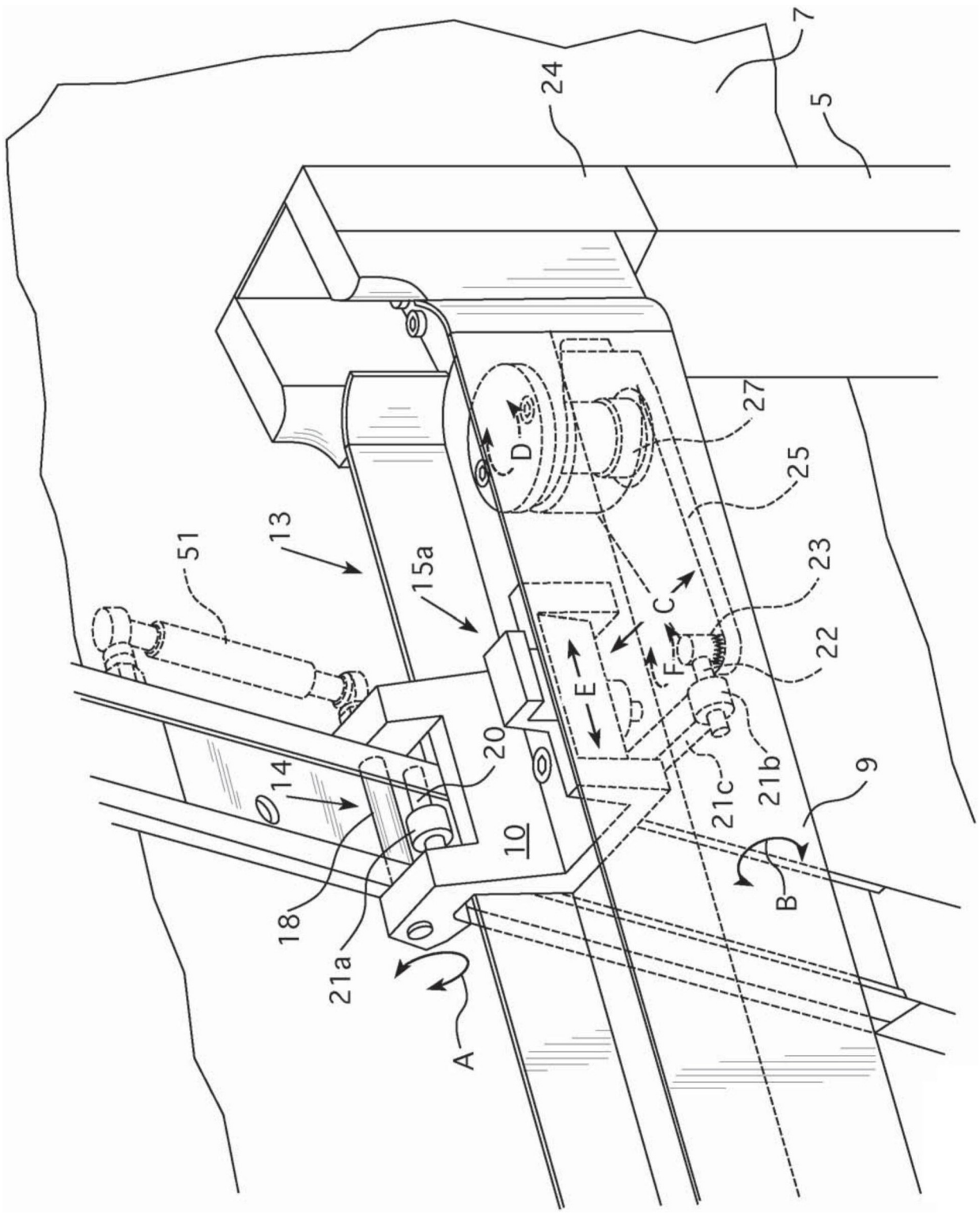


图11

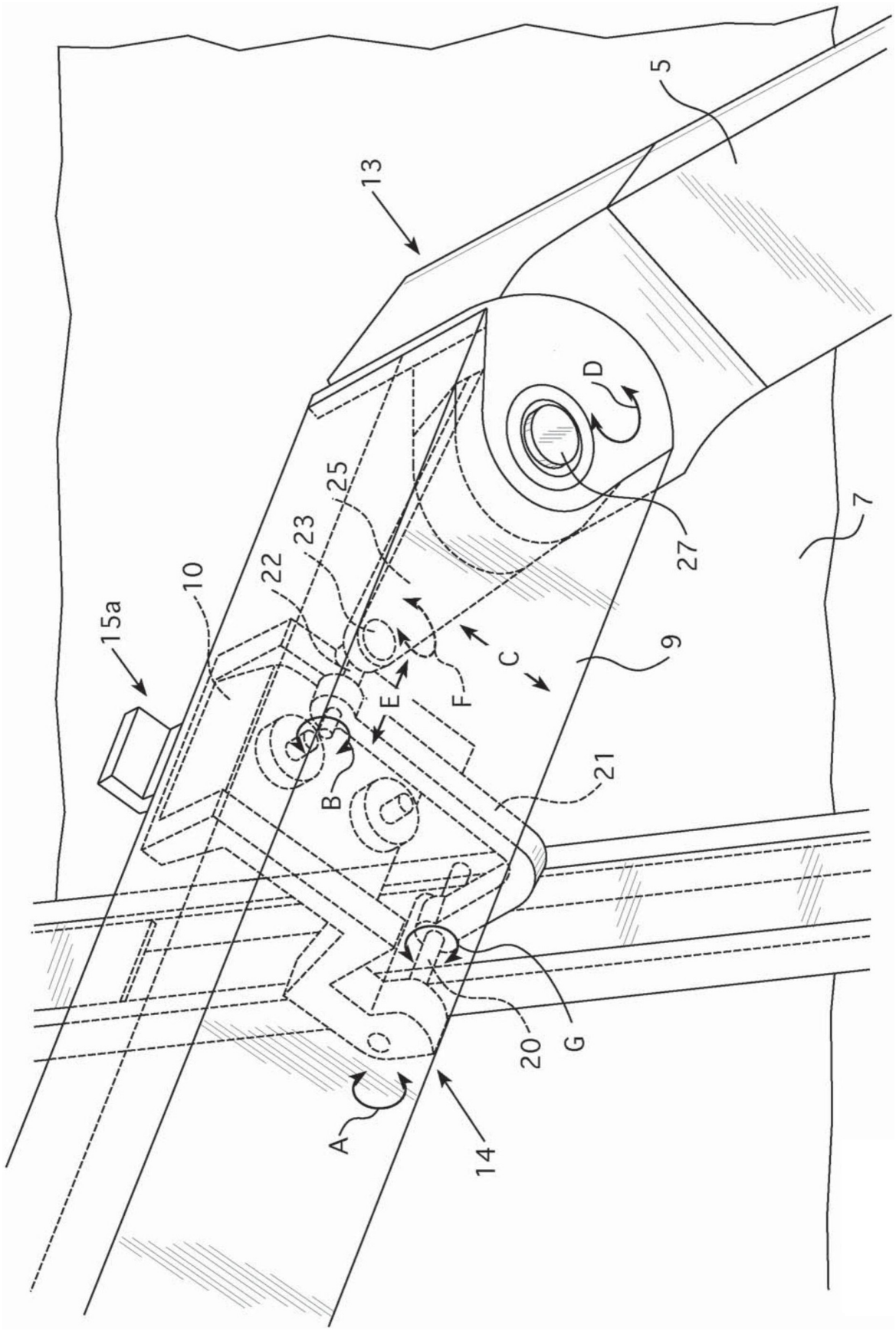


图12

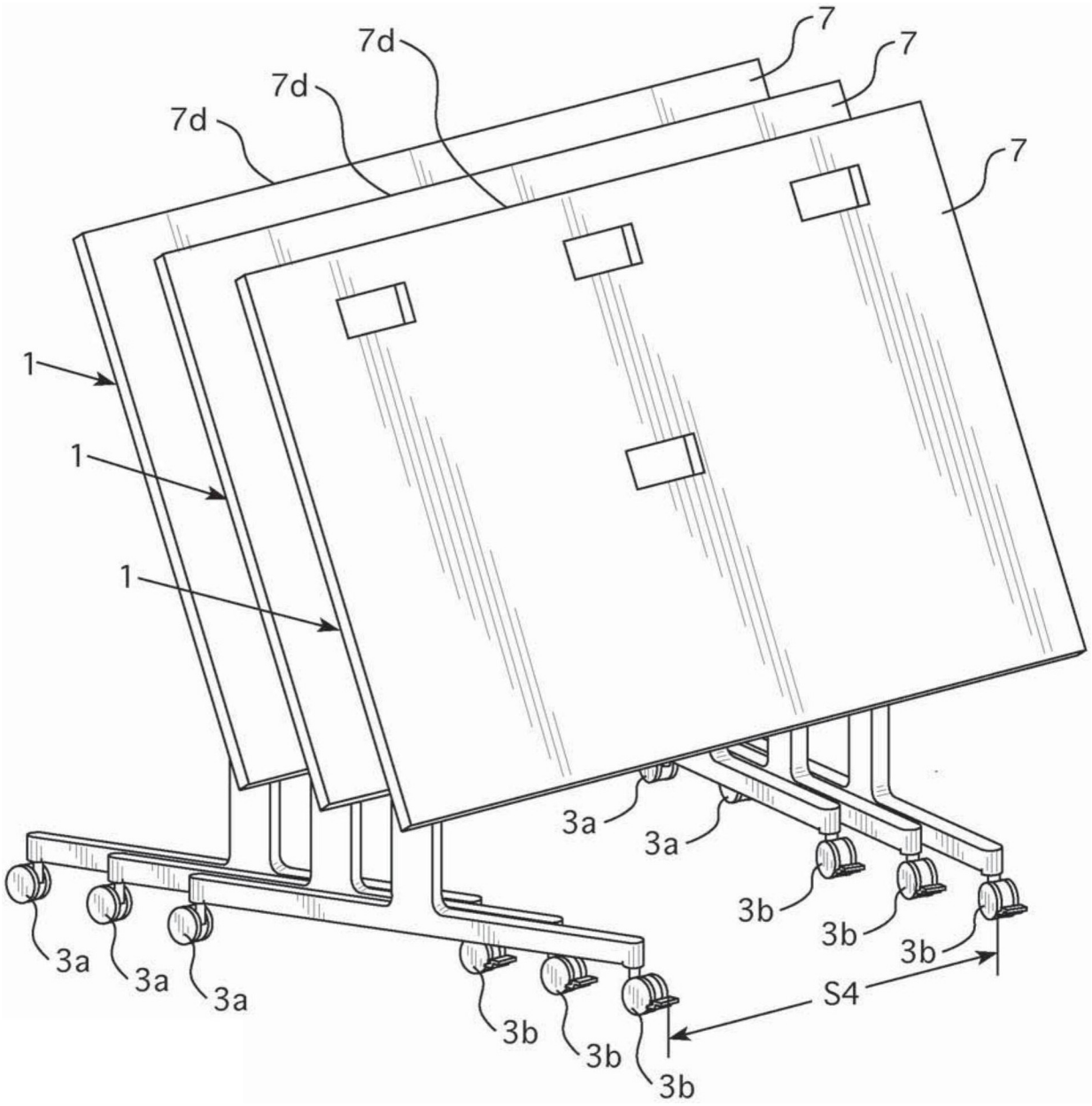


图13