

TABLE WITH AN ANGLE-ADJUSTABLE TABLE TOP

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5 This invention relates to a table with an angle-adjustable table top, more particular to a table with an angle-adjusting mechanism for permitting adjustment of an inclining angle of a table top thereof.

10 A table with an angle-adjustable table top permits adjustment of an inclining angle of a table top thereof through an angle-adjusting mechanism. Such table, as shown in Figs. 1 and 2, usually includes a supporting body 6, a table top 7, an angle-adjusting mechanism 8, and a pivot mechanism 9.

15 The supporting body 6 has an end side 600 and an opposing side 601 opposite to the end side 600.

20 The table top 7 has an end side 700, which is pivoted on the end side 600 of the supporting body 6 via the pivot mechanism 9, and an opposing side 701, which is opposite to the end side 700 of the table top 7. The table top 7 is moveable to approach or separate from the opposing side 601 of the supporting body 6 such that the table top 7 on the supporting body 6 can be turned to adjust an inclining angle of the table top 7 with respect to the supporting body 6.

25 The angle-adjusting mechanism 8 has two end portions 800, 801, one of which is connected to the table top 7, another of which is connected to the supporting body 6.

The angle-adjusting mechanism 8 is configured to have:
a slidable telescopic structure between the end portions
800, 801 to permit the two end portions 800, 801 to move
toward or depart from each other along a moving path;
5 a plurality of locking positions along the moving path;
and a ratchet mechanism 806 serving as a locking mechanism
to releasably lock the telescopic structure 803 in one
of the locking positions. Accordingly, the table top
7 can be turned by the movement of the two end portions
10 800, 801 and supported by the angle-adjusting mechanism
8 locked in one of the locking positions to adjust the
inclining angle of the table top 7 with respect to the
supporting body 6.

With the provision of the ratchet mechanism 806, the
15 two end portions 800, 801 are restricted to depart from
each other by the sliding of telescopic structure, only
when conducting a descending operation.

That is to say, when it is desired to increase the
inclining angle, it is only needed to turn the table top
20 7 to have a desired inclining angle by a lifting operation
such that the opposing side 701 of the table top 7 moves
away from the opposing side 601 of the supporting body
1, and is thus easy to perform. This is because the lifting
operation makes the two end portions 800, 801 depart from
25 each other, and such operation is not restricted by the
ratchet mechanism 806. Thereafter, although the table
top 7 tends to fall down by virtue of its own weight to

push the two end portions 800, 801 to move toward each other, the table top 7 can be supported by the angle-adjusting mechanism 8 since the two end portions 800, 801 cannot move toward each other by virtue of the restriction imposed by the ratchet mechanism 806.

Furthermore, when it is desired to decrease the inclining angle, such operation is not executed by directly moving the opposing side 701 of the table top 7 toward the opposing side 601 of the supporting body 1, and the descending operation should instead be conducted as follows. First, the table top 7 is turned upwardly to a highest position by the lifting operation to release the ratchet mechanism 806. Then, the table top 7 is downwardly turned to have an inclining angle slightly lower than the desired inclining angle, or is downwardly turned to a lowest position. Finally, the table top 7 is turned to have the desired inclining angle by the lifting operation.

In such conventional table, unless the descending operation is performed, the falling of the table top 7 is restricted by the ratchet mechanism 806, and thus, the table top 7 can be safely supported by the angle-adjusting mechanism 8.

However, during the second step of the descending operation, it cannot be completely avoided that the table top 7 unexpectedly falls down by virtue of its own weight to rapidly approach the supporting body 6. Once this

happens, there is a risk of user injury.

Therefore, embodiments of the present invention provide a table with an angle-adjustable table top that can overcome the aforesaid drawbacks associated with the prior art.

Accordingly, a table with an angle-adjustable table top of the present invention comprises: a supporting body having an end side and an opposing side opposite to the end side; a table top having an end side, which is pivoted on the end side of the supporting body, and an opposing side, which is opposite to the end side of the table top and is moveable to approach or separate from the opposing side of the supporting body, such that the table top on the supporting body can be turned to adjust an inclining angle of the table top with respect to the supporting body; and an angle-adjusting mechanism having two end portions, one of which is connected to the table top, and another of which is connected to the supporting body, the angle-adjusting mechanism being configured to permit the two end portions to move toward or depart from each other along a moving path, and being configured to have a plurality of locking positions along the moving path such that the angle-adjusting mechanism can be locked in one of the locking positions, and such that the table top can be turned by the movement of the two end portions and supported by the angle-adjusting mechanism locked in one of the locking positions to adjust the inclining

angle of the table top with respect to the supporting body. The angle-adjusting mechanism includes an angle-adjusting member having the two end portions and being configured to have a slidable telescopic structure between the end portions such that the end portions can be slid toward or away from each other, and a bumper for mitigating a sliding speed of the telescopic structure to prevent the table top from rapidly approaching the supporting body when the telescopic structure slides.

In order to lock the telescopic structure of the angle-adjusting mechanism in one of the locking positions, the angle-adjusting mechanism is usually configured to have a locking mechanism. The locking mechanism can be the ratchet mechanism 806 in the prior art or any other releasable locking mechanism. However, to facilitate comparison with the prior art table, the locking mechanism is exemplified using the ratchet mechanism in the embodiments of this invention.

Other features and advantages of the present invention will become apparent in the following detailed description of the preferred embodiments of the invention, with reference to the accompanying drawings, in which:

Fig. 1 is a side view of a conventional table with an angle-adjustable table top;

Fig. 2 is a top view of the table of Fig. 1;

Fig. 3 is a top view illustrating a table with an angle-adjustable table top of the first embodiment

according to the present invention;

Fig. 4 is a side view of the table of Fig. 3;

Fig. 5 is a fragmentary enlarged view illustrating an angle-adjusting mechanism of the table of Fig. 4;

5 Fig. 6 is a side view illustrating two end portions of the angle-adjusting mechanism in Fig. 4 separated by a farthest distance;

Fig. 7 is a fragmentary enlarged view illustrating the angle-adjusting mechanism of the table of Fig. 6;

10 Fig. 8 is a fragmentary enlarged view illustrating a guard member of the table of Fig. 4;

Fig. 9 is a view similar to Fig. 8 but illustrating the guard member in a normal mode;

15 Fig. 10 is a side view illustrating a table with an angle-adjustable table top of the second embodiment according to the present invention;

Fig. 11 is a fragmentary enlarged view illustrating an angle-adjusting mechanism of the table of Fig. 10;

20 Fig. 12 is a side view illustrating the table top of Fig. 10 supported at a highest position;

Fig. 13 is a fragmentary enlarged view illustrating the angle-adjusting mechanism of the table of Fig. 12; and

25 Fig. 14 is a side view illustrating a table with an angle-adjustable table top of the third embodiment according to the present invention.

Before the present invention is described in greater

detail with reference to the accompanying preferred embodiments, it should be noted herein that like elements are denoted by the same reference numerals throughout the disclosure.

5 Referring to Figs. 3 to 9, a table with an angle-adjustable table top of the first embodiment according to the present invention is shown to include a supporting body 1, a table top 2, a pivot mechanism 3, and an angle-adjusting mechanism 4.

10 The supporting body 1 has an end side 100 and an opposing side 101 opposite to the end side 100. As best shown in Figs. 3 and 4, the supporting body 1 is constituted by left and right beams 10, a crossbeam 11, left and right leg parts 12, and left and right bases 13. The left and
15 right beams 10 are disposed to parallel each other, and are respectively supported by the left and right leg parts 12. The left and right leg parts 12 are symmetrical and are connected to each other through the crossbeam 11 and are respectively supported by the left and right bases
20 13.

Each of the left and right beams 10 has a front end disposed to adjacent to a user when he or she uses the table of this invention, and the two front ends of the left and right beams 10 cooperatively constitute the end
25 side 100 of the supporting body 1.

The table top 2 includes a main body 20 and an extension body 21, both of which are supported by the left and right

beams 10. The main body 20 is disposed adjacent to the user, and can be turned to adjust an inclining angle of the main body 20 with respect to the left and right beams 10. The extension body 21 is disposed to be away from the user, and is fixed in a substantially horizontal state.

In detail, the main body 20 has an end side 200 that is adjacent to the user, and an opposing side 201 opposite to the end side 200. With the provision of the pivot mechanism 3, the end side 200 of the main body 20 is pivoted between the front ends of the left and right beams 10 on the end side 100 of the supporting body 1, and the opposing side 201 of the main body 20 is moveable to approach or separate from the opposing side 101 of the supporting body 1 (i.e., portions of the left and right beams 10 which are close to the extension body 21). Furthermore, when the main body 20 is turned to lie down on and to be supported by the left and right beams 10, the main body 20 and the extension body 21 are substantially coplanar, and a gap 22 is formed therebetween.

The pivot mechanism 3 includes left and right shafts 31, and left and right bearings 30, each of which is formed with an axial hole 301 for receiving one of the left and right shafts 31. As shown in the figures, the left and right bearings 30 are disposed in the end side 200 of the main body 20 to be respectively adjacent to the left

and right beams 10. The left and right shafts 31 are respectively provided on the front ends of the left and right beams 10 on the end side 100 of the supporting body 1.

5 The angle-adjusting mechanism 4 includes a pair of angle-adjusting members 40, and a pair of bumpers 41. Because the angle-adjusting members 40, as well as the bumpers 41, are respectively and symmetrically disposed on left and right sides of the table and have the same
10 structure and function, only one angle-adjusting member 40 and one bumper 41 are described below.

Each of the angle-adjusting members 40 is disposed on one of the left and right sides of the table, and has two end portions 400, 401, one of which is connected to
15 the opposing side 201 of the main body 20, and another of which is connected to the crossbeam 11 of the supporting body 1. Each angle-adjusting member 40 is configured to permit the two end portions 400, 401 thereof to move toward or depart from each other along a moving path, and is
20 configured to have a plurality of locking positions along the moving path such that the angle-adjusting member 40 can be locked in one of the locking positions, and such that the main body 20 can be turned by the movement of the two end portions 400, 401 and supported by the
25 angle-adjusting member 40 locked in one of the locking positions to adjust the inclining angle of the main body 20 with respect to the supporting body 1.

Specifically, each angle-adjusting member 40 is configured to have a slidable telescopic structure between the end portions 400, 401 thereof such that the end portions 400, 401 can be slid toward or away from each other. The telescopic structure includes an outer tube 404, an inner member 405, and a locking mechanism 406. The outer tube 404 is formed with an inner space 4040. The inner member 405 is slidably received in the inner space 4040 to move toward or depart from the outer tube 404. The locking mechanism 406 is disposed inside the inner space 4040 and can releasably lock the outer tube 404 and the inner member 405 together.

In this embodiment, a ratchet mechanism is used as the locking mechanism 406. Like the prior art ratchet mechanism 806, the ratchet mechanism used therein restricts the inner member 405 such that the inner member 405 can only be moved to depart from the outer tube 404 unless the descending operation is conducted.

In detail, the ratchet mechanism (locking mechanism 406) includes a guiding trench 408, a plurality of ratchet notches 402, and a pawl 407. As best shown in Fig. 7, the guiding trench 408 is formed along an extending direction of the outer tube 404. The ratchet notches 402 are formed along one side of the guiding trench 408. The pawl 407 is provided on an outer surface of the inner member 405 and is inserted into the guiding trench 408.

Each of the ratchet notches 402 is formed with an

opening oriented to a direction where the inner member 405 departs from the outer tube 404. The pawl 407 is biased toward the side of the guiding trench 408 where the ratchet notches 402 are provided. Accordingly, when the inner member 405 departs from the outer member 404, the pawl 407 can upwardly move over the ratchet notches 402 one by one. On the other hand, when the inner member 405 is moved toward the outer tube 404, the pawl 407 will be immediately engaged by a nearest ratchet notch 402.

Moreover, as shown in Fig. 7, the guiding trench 408 has two ends not provided with the ratchet notches 402. When the pawl 407 moves to one of the two ends of the guiding trench 408, the pawl 407 will not be engaged by any one of the ratchet notches 402 and can be freely moved between the two ends of the guiding trench 408. Since the function of the ratchet mechanism is the same as that of the ratchet mechanism 806 in the prior art, further details of the same are omitted hereinafter.

The bumper 41 can be any device, as long as it can mitigate a sliding speed of the telescopic structure to prevent the main body 20 of the table top 2 from rapidly approaching the supporting body 1 when the telescopic structure of the angle-adjusting member 40 slides. For example, the bumper 41 can be a hydraulic bumper, a pneumatic bumper, a spring bumper, etc.

In this embodiment, the bumper 41 is the hydraulic bumper, and has two end portions 410, 411, one of which

is connected to the main body 20 of the table top 2, and another of which is connected to the crossbeam 11 of the supporting body 1, and is also configured to have a slidable telescopic structure between the end portions 410, 411 of the bumper 41, such that the end portions 410, 411 of the bumper 41 can be slid toward or away from each other, and such that the bumper 41 and the angle-adjusting member 40 are juxtaposed.

Because the angle-adjusting mechanism 4 of this invention is not only provided with the angle-adjusting member 40, but is also provided with the bumper 41, when the main body 20 of the table top 2 is downwardly turned during the descending operation as described in the prior art, the speed of the main body 20 of the table top 2 when approaching the supporting body 1 can be slowed down by the bumper 41 to prevent user injury.

Furthermore, the table of this embodiment further includes a guard member 5 that is also for preventing user injury when the main body 20 of the table top 2 moves toward the supporting body 1.

The guard member 5 includes two end portions 51, 52 having different weights, and an L-shaped body 50 constituted by two segments 501, 502. The guard member 5 is rotatably coupled to the left beam 10 of the supporting body 1 adjacent to the left bearing 30 provided on the left beam 10.

The end portion 51 that has a heavier weight is normally

drooping down, is plumb-shaped, and is formed with the segment 501 of the L-shaped body 50.

The end portion 52 that has a lighter weight is formed with the segment 502 of the L-shaped body 50 and extends from an extending direction of the segment 502 of the L-shaped body 50 to deviate toward a direction opposite to an extending direction of the segment 501 of the L-shaped body 50. Furthermore, the end portion 52 is normally in an upwardly protruded position, such that the end portion 52 can press against the main body 20 and can prevent the main body 20 from tightly contacting the supporting body 1 when the main body 20 moves toward the supporting body 1. When the end portion 52 is shifted from the upwardly protruded position by rotating the guard member 5, the main body 20 can fall down by virtue of its own weight to tightly contact the supporting body 1.

Figs. 10~13 illustrate a table with an angle-adjustable table top of the second embodiment which also includes a supporting body 1, a table top 2, a pivot mechanism 3, and an angle-adjusting mechanism 4.

In this embodiment, the table top 2 and the pivot mechanism 3 are the same as those in the first embodiment, and thus, a detailed explanation thereof is omitted below.

The supporting body 1 in this embodiment is not provided with the crossbeam 11. While the left and right leg parts 12 are also symmetrical as those in the first

embodiment, each of the leg parts 12 in this embodiment includes front and rear legs 120, 121, and a side board 122 for covering a space between the front and rear legs 120, 121 and for reinforcing the front and rear legs 120, 121. Because the left and right leg parts 12 are symmetrical, only one leg part 12 is described below.

The rear leg 121 on the left side of the table is disposed under the extension body 21 to be fixed to the left beam 10, and supports the extension body 21 through the left beam 10. The front leg 120 on the left side of the table has a slidable upper end passing through the left beam 10 to support the main body 20.

It should be noted that, in this embodiment, the front leg 120 not only serves as one leg of the table to support the main body 20, but also serves as the outer tube 404 of the corresponding angle-adjusting member 40.

The angle-adjusting mechanism 4 of the second embodiment differs from the first embodiment only in that the guiding trench 408 and the ratchet notches 402 are formed in the inner member 405, that the pawl 407 is provided on an inner wall of the outer tube 404, and that the bumper 41 is disposed in the front leg 120 serving as the outer tube 404 to be in line with the inner member 405, such that one end portion 410 of the bumper 41 is connected to the inner member 405 and such that another end portion 411 of the bumper 41 is connected to the outer tube 404.

Fig. 14 illustrates a table with an angle-adjustable table top of the third embodiment. The third embodiment differs from the second embodiment only in that one end portions 410 of the bumper 41 is connected to the main body 20 of the table top 2, and another end portions 411 of the bumper 41 is connected to the supporting body 1, and that the bumper 41 is not in line with the inner member 405.

While the present invention has been described in connection with what are considered the most practical and preferred embodiments, it is understood that this invention is not limited to the disclosed embodiments but is intended to cover various arrangements included within the spirit and scope of the broadest interpretations and equivalent arrangements.

We claim:

1. A table with an angle-adjustable table top, comprising:
a supporting body having an end side and an opposing side opposite to said end side;

5 a table top having an end side, which is pivoted on said end side of said supporting body, and an opposing side, which is opposite to said end side of said table top and is moveable to approach or separate from said opposing side of said supporting body, such that said
10 table top on said supporting body can be turned to adjust an inclining angle of said table top with respect to said supporting body; and

an angle-adjusting mechanism having two end portions, one of which is connected to said table top, and another
15 of which is connected to said supporting body, said angle-adjusting mechanism being configured to permit said two end portions to move toward or depart from each other along a moving path, and being configured to have a plurality of locking positions along said moving path
20 such that said angle-adjusting mechanism can be locked in one of said locking positions, and such that said table top can be turned by the movement of said two end portions and supported by said angle-adjusting mechanism locked in one of said locking positions to adjust the inclining
25 angle of said table top with respect to said supporting body;

wherein said angle-adjusting mechanism includes an

angle-adjusting member having said two end portions and being configured to have a slidable telescopic structure between said end portions such that said end portions can be slid toward or away from each other, and a bumper for mitigating a sliding speed of said telescopic structure to prevent said table top from rapidly approaching said supporting body when said telescopic structure slides.

2. The table of claim 1, wherein said angle-adjusting member includes:

an outer tube formed with an inner space;

an inner member slidably received in said inner space to move toward or depart from said outer tube; and

a locking mechanism disposed inside said inner space and releasably locking said outer tube and said inner member together.

3. The table of claim 2, wherein said bumper has two end portions, one of which is connected to said table top, and another of which is connected to said supporting body, and is configured to have a slidable telescopic structure between said end portions of said bumper, such that said end portions of said bumper can be slid toward or away from each other, and such that said bumper and said angle-adjusting member are juxtaposed.

4. The table of claim 2, wherein said bumper has two end portions, and is configured to have a slidable telescopic structure between said end portions of said bumper, said bumper being disposed in said inner space to be in line with said inner member such that said end portions of said bumper can be slid toward or away from each other, and such that one of said end portions of said bumper is connected to said inner member and another of said end portions of said bumper is connected to said outer tube.

5. The table of claim 4, wherein said outer tube of said angle-adjusting member serves as one part of said supporting body.

6. The table of claim 5, wherein:
said supporting body has a plurality of legs;
said outer tube of said angle-adjusting member serves as one of said legs of said supporting body; and
said bumper is disposed in said one of said legs of said supporting body.

7. The table of claim 1, further comprising a guard member for preventing user injury when said table top moves toward said supporting body, wherein said guard member has two end portions, one end portion being heavier than another end portion, said guard member being

rotatably coupled to said supporting body such that said one end portion is normally drooping down and said another end portion is normally in an upwardly protruded position for pressing against said table top and for preventing said table top from tightly contacting said supporting body when said table top moves toward said supporting body and such that said table top can fall down by virtue of its own weight to tightly contact said supporting body when said another end portion is shifted from the upwardly protruded position by rotating said guard member.

8. The table of claim 7, wherein:

said guard member includes said two end portions having different weights and an L-shaped body constituted by two segments;

said one end portion that has a heavier weight is plumb-shaped and is formed with one of said two segments of said L-shaped body; and

said another end portion that has a lighter weight is formed with another of said two segments of said L-shaped body and extends from an extending direction of said another of said two segments of said L-shaped body to deviate toward a direction opposite to an extending direction of said one of said two segments of said L-shaped body.