TITLE

WELDING/WORK TABLE & CLAMPING DEVICE

BACKGROUND OF THE INVENTION

The invention relates to a welding/work table that comprises a plurality of channels, at least one cross beam and a plurality of legs which are adjustable in height, and ready for the mounting of a clamping device where the device comprises of a plurality of swinging rollers. The welding/work table is designed to be coupled with the clamping device. With this type of welding/work table and combined clamping device objects that are expected to be welded or worked on can be clamped to a table in an easy and adjustable manner and then be secured against movement.

SUMMARY OF THE INVENTION

At least one embodiment relates to a welding/work table comprising a table section comprising a plurality of channels, at least one cross-beam wherein the plurality of channels are coupled to said at least one cross-beam. There can also be a plurality of adjustable legs comprising a first leg section and a second leg section, the first leg section being configured to be telescoping within said second leg section. The adjustable legs provide adjustable table height which provides ergonomic consideration to fit different operators' height. Coupled to the table can be at least one work piece.

The work piece can be secured by at least one anchor for anchoring the work piece to the table section.

In addition selectively coupled to the table are a plurality of clamping devices which comprise a vertical column which can slide along in the channel and selectively fixable to the table at different locations on the table and at least one clamp which is selectively fixable to the vertical column with respect to both height and rotational position on the vertical column. The clamp is configured to be rotatable or swingable on the vertical columns and then clamped to an object to be welded or work piece by compression. Essentially in one embodiment there can be at least two clamping devices spaced opposite each other to compressively clamp a work piece in place. In at least one embodiment, there can be at least two clamping devices wherein one of these clamping devices is positioned on one side of the work piece and one of these clamping devices are positioned on an opposite side of the work piece. In at least one embodiment there can be at least four clamping devices including two clamping devices on one side and two clamping devices on another side.

BRIEF DESCRIPTION OF THE DRAWINGS

Other objects and features of the present invention will become apparent from the following detailed description considered in connection with the accompanying drawings which disclose at least one embodiment of the present invention. It should be

understood, however, that the drawings are designed for the purpose of illustration only and not as a definition of the limits of the invention.

In the drawings, wherein similar reference characters denote similar elements throughout the several views:

FIG. 1 shows a perspective view of a first embodiment comprising both a welding/work table and clamping device;

FIG. 2 shows a close-up perspective view of a clamping device coupled to a welding/work table;

FIG. 3 shows an end view of the clamping device with a clamp base anchoring into the C-channel;

FIG. 4 shows another embodiment; and

FIG. 5 shows another embodiment of the clamping device with two clamping rollers.

DETAILED DESCRIPTION

Referring to the drawings, FIG 1 depicts the invention of an adjustable welding/work table 1 with mountable clamping device 14 comprising a clamp 26 and a column 27. While the clamping devices 14 can comprise any number of clamping devices in this embodiment, there are shown four clamping devices 14a, 14b, 14c, and 14d; clamping devices 14a and 14b are on one side of a work piece 24, while clamping

devices 14c and 14d are on the opposite side of the work piece. Each of the clamping devices comprises a clamp 26 and a column 27. Clamp 26 is a versatile rotating roller clamp comprising a connector 21, a roller 22, and a screw or lock 23. Column 27 includes columns 15 and 16 extending up from the table 1 with plates 17 and 19 coupled at each end of the columns 15 and 16.

The size of the table 1 may vary as it is dependent on the size of the work piece 24 to be placed on top of the table 10 comprising C-shaped or U-shaped channels 10.1, 10.2, 10.3 (see FIG. 3). The work piece 24 is held in place on the table 1 by the clamps such as clamps 26. Each of the C-shaped channels are configured to hold the rotating or swingable roller clamps 26 while allowing them to selectively slide along the channels.

The table 1 has a plurality of legs 25, comprising a first section 6 and a second section 5. Second section 5 fits within first section 6 to form a telescoping leg. Legs 25 can be of adjustable height rendering ergonomic consideration to different operators' height and catering to the different heights of the work piece 24 to be welded or for tooling works.

For adjustable height consideration, the table legs 25 will consist of two concentric hollow metal round or rectangular sections 5, 6 with a pin 8 and hole 7 system to lock the required height of the table. The pin 8 with the hole system formed in

sections 5 and 6, form a lock, thereby locking the height of the legs in place. Thus, these legs are essentially telescoping legs which are adjustable in length.

In at least one embodiment, for example, in a fixed height system the table legs 25 will comprise a single metal section 6 only without the inner section 5 giving the required table height.

The legs of the metal section 6 will have each of its end that is to be placed on the floor to be welded or cast with a base plate 9 of any shape to render stability and spread the load of the welding/work table with its content on the floor. Alternatively, the option of locking casters 29 (See FIG. 4) can be used in place of the base plate 9 which allow easy mobility.

For adjustable height table, the lateral metal stiffeners 2 will be welded on top of all the vertical legs 25 to join and form the table top frame for the array of C-channels 10 to be fastened on. Whereas for fixed height table, the plurality of legs will only consist of the outer metal section or first section 6 without the inner concentric section or second section 5.

The lower lateral metal stiffeners 3 will be welded to the sides of the table legs section 6 for added structural stability to hold all the plurality of legs together.

For example, as shown in FIG. 2, each C-channel 10 such as C-channels 10.1, 10.2, 10.3 must have a profile with all of its two flanges 12 having ends curved or bent to form ends 13. These curved ends 13 along each of the C-channel 10 will provide a hold on the top part of the clamp base stopper 20 preventing it from dislodging from the C-channel groove 11 and toppling of the upper part of the clamping device 14 that is above the base stopper 20. Base stopper 20 essentially acts as a lock locking base plate 18 in place. The prevention of toppling of the clamping device 14 serves as a safety feature against injury to the operator or damage to the work piece 24.

Each C-channel 10 with the curved ends 13 at its flanges 12 will restrict the clamp base stopper 20 movement to only gliding along in the groove 11 of each C-channel 10. This gliding will quicken the movement of the clamping device 14 for positioning in gripping the work piece 24 without having to remove the clamping device 14 from the groove 11. The base plate 18 which holds the upper part of the clamping device is fastened onto the clamp base stopper 20 by a screw 19. This screw 19 can be loosened to allow the gliding of the base stopper 20 along the groove 11 for positioning of the clamping device 14 and when tighten to secure and lock the clamping device in the required position. Essentially the base plate 18 slides over the ends 13 while being locked to the ends by tightening screw 19.

In addition, there is shown clamping device 14 comprising clamps 26 and associated column 27. As indicated above, column 27 comprises a plurality of vertical

metal columns 15, 16 with the top and bottom ends of the columns tied to metal plates 17, 18 respectively.

The bottom plate 18 is anchored onto a base stopper 20 by a top screw 19. This screw 19 is used to loosen or tighten the clamping device 14 for movement or fixation respectively.

The clamps 26 comprise grip rollers 22 which are attached to the outer vertical metal column 16 by a swingable connector 21. The swingable connector 21 can rotate or swing around the vertical column 16 and its height can be adjusted along the column 16. The screw or lock 23 on tightening will lock both the adjusted height and swing position of the grip roller 22 particularly when the grip roller 22 is in the position of being securely in contact with the work piece 24.

The work piece 24 as shown in FIG. 1 can be easily secured by the plurality of grip rollers 22. Once the location of welding or tooling works on the work piece 24 is determined on the welding/work table 1, the grip roller 22 is then glided by swinging the swingable connector 21 until the glided grip roller 22 is firmly in contact on the work piece 24 surface. The screw or lock 23 is tightened to lock the swingable connector 21 in position thereby also locking the grip roller in position securing the work piece 24 from moving.

As shown in FIG. 2, a plurality of clamping devices 14 with a plurality of grip rollers 22 on each clamping device 14 will be used to secure the work piece 24, where the work piece 24 can be of irregular shape and varied size, from moving on the welding/work table 1 so that required welding or tooling works can be performed on the stationary work piece 24. When the grip roller is rotated into a position that has sufficiently more lateral extension it is now positioned so that it can clamp to a work piece, such as work piece 24.

This embodiment is designed so that a work piece can be placed on a table. The work piece can be positioned between at least two different clamping devices 14 (See also FIG. 5). While at least two different clamping devices are mentioned there can be alternatively any number of clamping devices such as four clamping devices, or six clamping devices or even an odd number of clamping devices such as three clamping devices or five clamping devices.

This embodiment is with two clamping devices 14 positioned on one side of the work piece and two clamping devices 14 positioned on an opposite side of the work piece. Each of the clamps 26 can be rotated vs. the column 27 so that when a piece is placed between these columns, the rotation of the clamps causes the rollers 22 to interact with the sides of the work piece. As these clamps are rotated towards a position wherein the connector 21 is extending substantially perpendicular to the extension of a corresponding side of a work piece, the clamp exerts increasing compressive force on a

side of the work piece thereby holding the work piece in place. Once all of the clamps are rotated into their position so that they exert substantially equal and opposite compressive forces on each other, these clamps 26 can be locked in place via screw or lock 23. Thus, clamp 14a exerts a compressive force on a first side of a work piece opposite clamping device 14d. Clamping device 14b exerts a compressive force on a first side of work piece 24 opposite clamping device 14c.

FIG. 3 further showed the details of the clamping device 14 with its anchorage into the C-channel 10 such as C-channels 10.1, 10.2 and 10.3. Each C-channel has both its flanges' 12 ends with a curve or bend to form a curved end 13.

The plurality of vertical metal columns 15, 16 with the bottom ends of the columns are tied to metal plate 18.

The bottom plate 18 is tied onto a base stopper 20 by a top screw 19. This screw 19 is used to loosen or tighten the clamping device 14 for movement or fixation respectively.

When the screw 19 is loosened, the base stopper 20 is consequently loosened from the base plate 18. This loosening will allow the clamping device 14 to move freely in and along the groove 11 of the C-channel 10 to the required position.

Alternatively, the clamping device 14 can also be completely removed at the ends of each C-channel 10 and re-inserted into another C-channel for re-positioning.

Once the specific new position of the clamping device 14 is determined in the groove 11 of the new C-channel, the screw 19 is tightened, resulting both the upper clamp base plate 18 and the lower base stopper 20 gripping or biting tightly the in-between curved or bent ends 13 of the C-channel 10. Thereby, locking the clamping device 14 in place from any movement in the groove 11 of the C-channel.

FIG. 5 is a view of another embodiment of the clamping device which shows only two clamping devices 14a and 14d.

With respect to clamping the work piece, the work piece can be clamped or secured via the clamping devices 14. For example, in a four clamping device structure, all four clamping devices 14a, 14b, 14c, and 14d can be secured and clamped to the work piece. In at least one embodiment, the process for securing the work piece comprises setting a first clamping device such as clamping device 14a on a table 1. In this case the first clamping device is fixed to a frame of the table such as to the channels 10 of the table.

Next, the work piece 24 is positioned adjacent to the first clamping device 14a such that a first side of work piece 24 is adjacent to the clamping device 14a.

Next, a second clamping device 14d is positioned on a table opposite the first clamping device 14a on a second side of the work piece 24.

Next, the work piece 24 is compressed by pressing said first clamping device 14a against a first side of said work piece and said second clamping device 14d against the second side of the work piece.

In this case, the invention is configured such that the step of compressing the work piece comprises pressing grip rollers 22 on each of said clamping devices on the work piece 24.

By rotating and securing these grip rollers 22 around a shaft or column 16 until they extend laterally along extension line into the work piece 24 and then securing these grip rollers with a lock such as lock 23, it then allows the work piece to be locked in place.

The invention discussed herein is not limited by the disclosures and illustrations specifically contained herein, which are only for purpose of enabling the invention contemplated. As long as any additional implementations are within the range of coverage enabled by the disclosure, they are considered to be within the scope of the present invention.

Accordingly, while at least one embodiment of the present invention have been shown and described, it is to be understood that many changes and modifications may be made thereunto without departing from the spirit and scope of the invention as defined in the appended claims.

CLAIMS

WHAT IS CLAIMED IS:

1. A table for holding at least one work piece comprising:

a table section comprising a plurality of channels;

at least one cross-beam wherein said plurality of channels are coupled to said at least one cross-beam;

a plurality of adjustable legs comprising a first leg section and a second leg section, said first leg section being configured to be telescoping within said second leg section wherein said plurality of adjustable legs provide adjustable table height which provides ergonomic consideration to fit different operators' height; and

at least one anchor for anchoring the at least one work piece to the table section;

wherein said at least one anchor comprises at least one vertical column coupled to said table section and at least one swingable grip roller coupled to said at least one vertical column, wherein said swingable grip roller is configured to clamp the at least one workpiece to the table.

2. The table as in claim 1, further comprising a stopper coupled to said at least one vertical column, wherein said plurality of channels comprise channels that are configured to hold said stopper in said plurality of channels but allow said stopper to slide along said channels.

3. The table as in claim 1, wherein the plurality of channels comprise any one of C-shaped channels or U-shaped channels.

4. The table as in claim 2, wherein the plurality of channels each have curved ends or ends that prevent the stopper from being dislodged from the channel but allow the vertical column to slide along the opening side of the channel.

5. The table as in claim 2, wherein the channels comprise elongated channels that have openings along its length and side walls with curved ends or ends that prevent said stopper from being dislodged from the channel.

6. The table as in claim 1, wherein the vertical column of said anchor further comprises a stopper that is configured to slide or glide freely and quickly in along an open side and inside of the channel, wherein said stopper is configured to prevent toppling of said vertical column.

7. The table as in claim 1, wherein said rotating grip rollers are configured to extend laterally into the at least one workpiece.

8. The table as in claim 1, further comprising at least one locking caster coupled to said at least one leg.

9. The table as in claim 5, wherein said plurality of channels have curved ends or ends that prevent the stopper from being dislodged from the channel but allow the vertical column to slide freely along the opening side of the channel, and wherein the table further comprises at least one lock for locking the clamping device in place wherein said at least one lock is secured in place.

10. The table as in claim 1, further comprising at least one connector coupling said at least one clamp to said at least one vertical column.

11. The table as in claim 10, wherein said at least one connector is rotatably coupled to said at least one vertical column.

12. A table for holding at least one work piece comprising:

a table section comprising a plurality of channels;

at least one cross-beam wherein said plurality of channels are coupled to said at least one cross-beam;

a plurality of adjustable legs comprising a first leg section and a second leg section, said first leg section being configured to be telescoping within said second leg

section wherein said plurality of adjustable legs provide adjustable table height which provides ergonomic consideration to fit different operators' height; and

at least one anchor for anchoring the at least one work piece to the table section wherein said at least one anchor comprises at least one clamping device for clamping a work piece in place wherein said at least one clamping device further comprises at least one vertical column having at least one clamp configured to clamp a work piece in place wherein said at least one clamping device is both vertically adjustable and rotatably adjustable on said at least one vertical column and wherein the clamping device further comprises at least one lock for selectively locking said at least one clamp with respect to said column both vertically and rotationally and wherein when said at least one vertical column is not locked, said at least one vertical column is configured to slide along said plurality of channels.

13. A table for holding at least one work piece comprising:

a table section comprising a plurality of channels;

at least one cross-beam wherein said plurality of channels are coupled to said at least one cross-beam;

a plurality of adjustable legs comprising a first leg section and a second leg section, said first leg section being configured to be telescoping within said second leg section wherein said plurality of adjustable legs provide adjustable table height which provides ergonomic consideration to fit different operators' height; and

at least one anchor for anchoring the at least one work piece to the table section wherein the at least one anchor comprises at least one clamping device for clamping a work piece in place wherein said clamping device further comprises at least one vertical column having at least one clamp configured to clamp a work piece in place wherein said at least one anchor further comprises at least one connector coupling said at least one clamp to said at least one vertical column wherein said at least one connector is rotatably coupled to said at least one vertical column wherein said at least one connector is a swingable connector coupled to at least one of said vertical columns.

14. The table as in claim 13, further comprising at least one lock configured for locking the connector to any one of the vertical columns in place.

15. The table as in claim 1, wherein said at least one vertical column further comprises at least one additional vertical column.

16. The table as in claim 15, wherein each vertical column has at least one clamp, and wherein at least one vertical column of said clamping device is positioned on one side of the work piece and at least a second vertical column of said clamping device is positioned on an opposite side of the work piece.

17. The table as in claim 16, wherein each vertical column is coupled to a lock configured for locking said vertical column along a channel.

18. A process for securing a device on a table as claimed in claim 13, the process comprising:

setting a first clamping device on a table, wherein said first clamping device is fixed to a frame of the table;

positioning a work piece adjacent to said first clamping device such that a first side of said work piece is adjacent to said clamping device;

setting a second clamping device on a table opposite said first clamping device on a second side of said work piece;

compressing the work piece by pressing said first clamping device against a first side of said work piece and said second clamping device against the second side of the work piece.

19. The process for securing a device on a table as in claim 18, wherein said step of compressing the work piece comprises rotating said plurality of grip rollers such that they extend laterally into the work piece.

20. The process as in claim 19, further comprising the step of sliding the vertical column along the channels before the step of compressing the work piece.