June 22, 1965 W. L. COURT 3,190,638

CLAMP

Filed Nov. 4, 1963

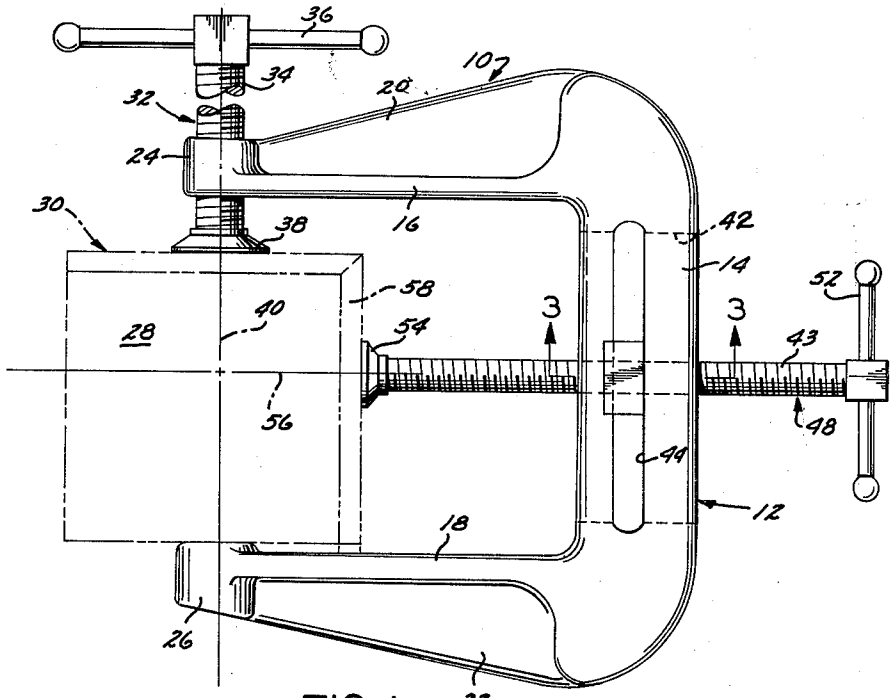


FIG. 1

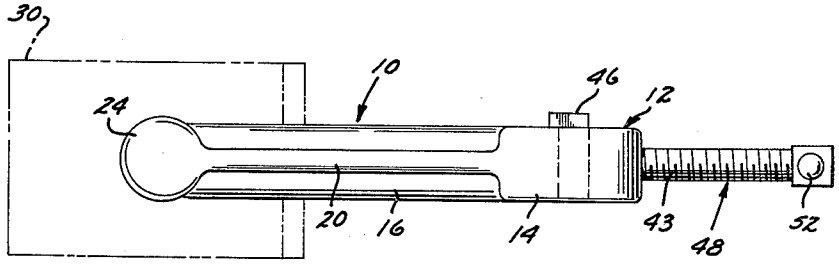


FIG. 2

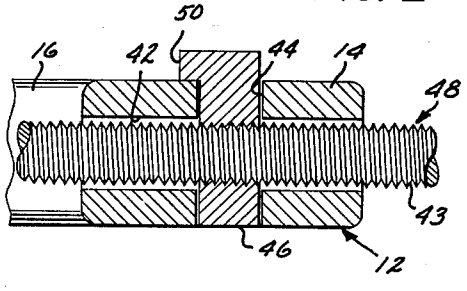


FIG. 3

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CLAMP

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1 Claim. (Cl. 269—248)

The present invention realtes to a clamp, and more particularly to a clamp which is adapted to apply clamping pressures simultaneously along a pair of axes which are disposed substantially normal to each other.

One of the most common clamps to be found in the home or in small job shops is the C-clamp, constituted by a C-shape frame whose free extremities form jaws, with one of the jaws threadably mounting a screw element for clamping a workpiece between the jaws.

This type of clamp is so widely used and for such a variety of applications that the representative example elected for discussion herein should not be construed as limiting, being chosen solely to afford a comparison of the respective construction and operation of the prior art C-clamp and the clamp of the present invention. Thus, assuming a pair of elongated strips of material are to be adhesively secured together, a number of the conventional C-clamps can be fitted across the strips and used to advantage since the thickness of the combined strips allows them to be conveniently received in the space defined between the C-clamp jaws. However, where the element is an elongated facing or decorative edge, for example, which is to be adhesively secured to the edge of a plywood table top, the distance between the decorative facing and an opposite, parallel face of the table top is too great for disposition of the work between the jaws of the usual C-clamp. In this situation, recourse has usually been had to other types of clamps, such as an elongated rod having ends threadably carrying a pair of jaw portions which are brought toward each other by rotation of the threaded rod. Similar applications of this nature prevent use of the usual C-clamp, particularly where the outer faces of the parts to be clamped together are widely spaced apart.

Accordingly, it is an object of the present invention to provide a clamp which is adapted to apply clamping pressure to one face of a workpiece even though the opposite face of the workpiece is relatively far away.

Another object of the invention is to provide a clamp of the aforementioned character which performs all of the functions of the usual C-clamp, is applied in the same fashion, but which is characterized by the provision of clamping pressure along an axis substantially normal to the clamping axis of the jaws of the conventional C-clamp.

A further object of the invention is the provision of a clamp of the aforementioned character in which the above-described multiple clamping action is provided by a relatively inexpensive modification of the main or central portion of the usual C-clamp frame.

Another object of the invention is the provision of a clamp of the aforementioned character which is adapted to apply clamping pressure along a first axis, in a manner substantially identical to the conventional C-clamp, and is also adapted to apply clamping pressure along a second axis substantially normal to the first axis, and wherein the point of application of clamping pressure along the second axis can be altered.

Yet another object of the invention is to provide a clamp of the aforementioned character which is relatively inexpensive to manufacture, rugged, and characterized by long service life.

Other objects and features of the invention will become apparent from consideration of the following description taken in connection with the accompanying drawings, in which:

FIG. 1 is a side elevational view of a clamp according to the present invetion, a clamped workpiece being illustrated in phantom outline;

FIG. 2 is a bottom plan view of the clamp of FIG. 1; and

FIG. 3 is an enlarged detail view taken along the line 3—3 of FIG. 1.

Referring now to the drawings, there is illustrated a clamp **10** according to the present invention which comprises a C-shaped frame **12** which includes a main body or portion **14** and a pair of fixed jaws **16** and **18** integral with and extending substantially normal to the body portion **14**. The jaws **16** and **18** are of thinner section than the body portion **14**, as best viewed in FIG. 1, and a pair of integral ribs or webs **20** and **22** are provided to strengthen the jaws against deformation, extending between the body portion **14** and the free extremities of the jaws **16** and **18**, respectively.

The free extremities of the jaws **16** and **18** include integral enlarged portions or bosses **24** and **26**, respectively, whose inner faces define a space **28** within which a workpiece is receivable, as indicated in phantom outline at **30**. The term "workpiece" is broadly used to include both unitary and composite articles which are to be clamped.

Clamping pressure is applied to the workpiece **30** by a screw element **32** which includes an elongated, threaded screw shaft or rod **34** threadably carried by the boss **24**. The upper extremity of the screw shaft **34** is adapted to carry a transversely disposed handle **36** by which the screw shaft **34** can be rotated, and the opposite, lower extremity of the screw shaft **34** carries a pressure application element **38** which is preferably press-fitted in position. If desired, the element **38** could be "universally" pivotally secured to the screw shaft **34** for accommodation to different face angles of different workpieces, as will be apparent.

The axis of the screw shaft **34** is aligned with the centerlines of the bosses **24** and **26** so that the screw element **32** is operative to apply clamping pressure upon the workpiece **30** along a clamping axis **40** passing through the bosses.

As best viewed in FIGS. 1 and 3, the frame body portion **14** includes an elongated horizontal channel **42** and an elongated vertical channel **44**, the vertical channel **44** being adapted to slidably accept a traveling nut **46** which is threadably mounted upon an elongated screw shaft **43** of a screw element **48** which is slidable in the horizontal channel **42**.

The upper extremity of the traveling nut **46** includes a flange or lip **50** which overlies the adjacent edge of the vertical channel **44**, preventing the nut **46** from rotating during rotation of the screw element **48**.

The screw element **48** includes a transverse handle **52** mounted to one extremity of the screw shaft **43**, for rotating the element **48**, and the opposite extremity of the screw shaft **43** mounts a pressure application element **54**, like the element **38**, for engaging the workpiece **30**. Thus, the screw element **48** is adapted to apply clamping pressure to the workpiece **30** along an axis **56** which is substantially normal to the axis **40** along which the screw element **32** applies its clamping pressure.

The provision of the channels **42** and **44** permits the point of pressure application of the screw element **48** to be varied, as by sliding the screw element **48** and the traveling nut **46** along the axis of the channels **42** and **44** until the desired position is reached.

Assuming that the workpiece **30** is a table top which has a thickness such that it will fit between the confronting faces of the boss **26** and the element **38** as illustrated, and further assuming that an adhesively coated decorative facing **58** is to be clamped to the edge of the table top

workpiece 30, the screw element 32 is first operated to firmly clamp the workpiece between the element 38 and the boss 26. Next, the screw element 48 is operated to exert clamping pressure along the axis 56, substantially normal to the axis 40. The clamping pressure provided by the screw element 32 maintains the workpiece 30 firmly in position so that clamping pressure along the axis 56 may be developed by the screw element 48.

From the foregoing, it is seen that a clamp has been provided which is a modification of the usual C-clamp design, the present clamp thereby being adapted to simultaneously apply clamping pressure along a pair of axes which are disposed subtantially at right angles or normal to each other. This permits clamping pressure along one axis to anchor the workpiece in position for development of clamping pressure along the other axis.

Various modifications and changes may be made with regard to the foregoing detailed description without departing from the spirit of the invention or the scope of the following claim.

I claim.

A C-clamp comprising:

a generally C-shape frame having an elongated body and a pair of spaced jaws integral with and extending transversely of said body to define a space for receiving a workpiece, said body having a first channel oriented along a longitudinal axis and extending through the thickness of said body, said body further having a second channel oriented along a longitudinal axis and extending through the width of said body and through said first channel;

a first screw element threadedly mounted upon one of said jaws and operative to apply clamping pressure along a first axis substantially parallel to the longitudinal axes of said first and second channels for holding a workpiece between said jaws;

a traveling nut slidably movable within said first channel and including a threaded opening extending along a second axis perpendicular to and intersecting said first axis and passing through said second channel, said nut having a flange located exteriorly of said first channel in overlying relation to said body for engagement therewith to prevent said nut from rotating about said second axis, said nut otherwise having a thickness slightly less than the width of said first channel whereby said nut is adapted for slidable insertion into siad first channel during assembly;

and a second screw element extending along said second axis and threaded through said opening of said nut, said screw element being freely movable within said second channel and operative to apply clamping pressure to a workpiece along said second axis.

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