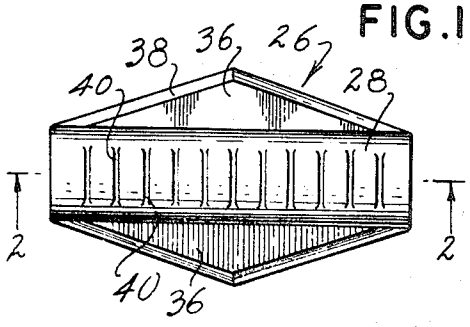
Jan. 5, 1971 J. M. MARATECK 3,552,050

KNOCKDOWN FRAME FOR PICTURES OR THE LIKE

Filed June 23, 1969

FIG. 1



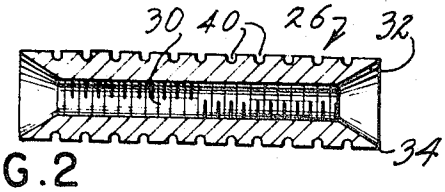


FIG. 2

FIG. 4

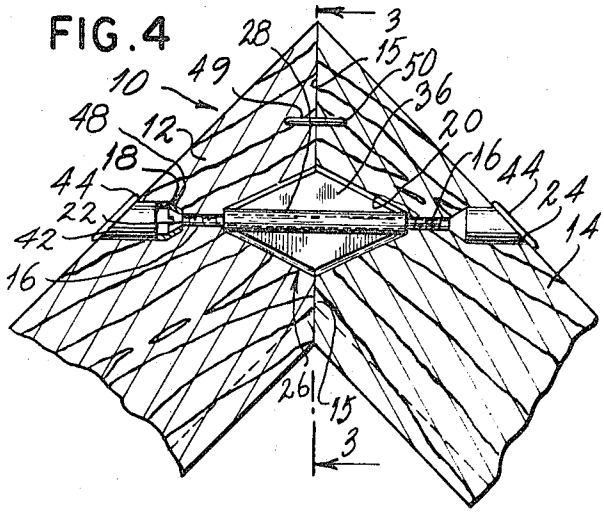


FIG. 5

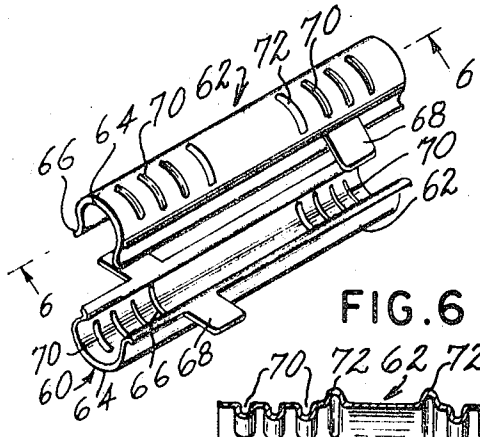


FIG. 6

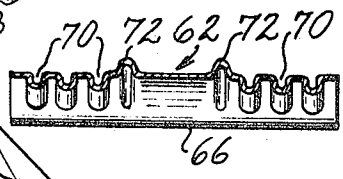


FIG. 3

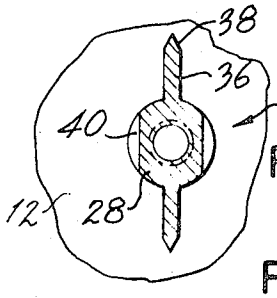


FIG. 9

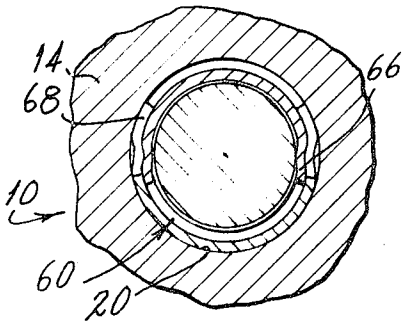


FIG. 7

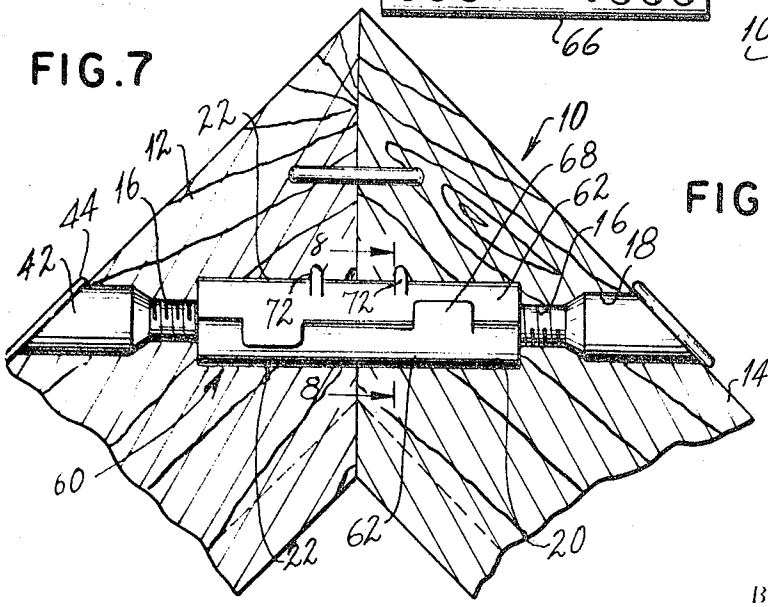
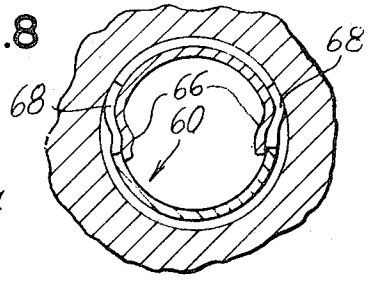


FIG. 8



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United States Patent Office 3,552,050
Patented Jan. 5, 1971

3,552,050

KNOCKDOWN FRAME FOR PICTURES OR THE LIKE

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Filed June 23, 1969, Ser. No. 835,462
Int. Cl. G09f 1/12
U.S. Cl. 40—155 19 Claims

ABSTRACT OF THE DISCLOSURE

A picture frame assembly formed of sides having juxtaposed mitered ends, each mitered end having an aperture bored therethrough at right angles to its mitered face, each aperture having an enlarged bore end portion opening into its mitered face; a coupling element disposed in the enlarged bore portions of the apertures of juxtaposed frame sides; each coupling element threaded at each end and engaged at each end by a threaded member inserted through the other end of each aperture into which it is inserted.

The present invention relates to frames for pictures, or the like, and particularly to knock-down frames that may be shipped and delivered in knock-down form and assembled and set up at point of use.

Knock-down frames of the character described have heretofore been known in various forms. However, such frames of the prior art have been either too costly, or too difficult to assemble, or not sufficiently rigid and sturdy when assembled. Also, in many instances the assembled frames possessed features that detracted from their appearance, making them unattractive and unsightly for decorative use.

It is an object of the present invention, therefore, to provide knock-down frames, of the character described, which are relatively simple and easy to assemble, requiring only the use of a screwdriver and no other tool.

It is another object of the present invention to provide knock-down frames, of the character described, the frame members and assembling fittings for which are adaptable for mass production and are therefore relatively economical to produce.

It is a further object of the present invention to provide knock-down frames, of the character described, which, when assembled, have a smooth and unencumbered external appearance and are completely suitable for decorative use.

Generally stated, the knock-down frame of the present invention comprises frame sections or sides, the mitred ends of which are provided with bores formed therethrough which are counter-sunk at each end to provide bores of relatively small cross-section at the center and enlarged portions at each end. A coupling element is set into the enlarged portions in the facing mitred sides of two adjacent frame sections and screws are passed through the other enlarged bore ends of each of the two frame sections the ends of such screws being each engaged in one end of the coupling element. The coupling element is so formed that it is tightly held in place, against rotation with the enlarged bore portions in which it is held.

In the drawings:

FIG. 1 is a plan view of one embodiment of a coupling element for assembling a knockdown frame of the present invention;

FIG. 2 is a section taken on line 2—2 of FIG. 1;

FIG. 3 is a section taken on line 3—3 of FIG. 1;

FIG. 4 is a sectional view through a corner of a frame which is assembled by means of the coupling element of FIGS. 1 to 3;

FIG. 5 is an exploded view of another form of a coupling element;

FIG. 6 is a section taken on line 6—6 of FIG. 5;

FIG. 7 is a section taken through a corner of a frame assembled by means of the coupling element of FIG. 5;

FIG. 8 is a section taken on line 8—8 of FIG. 7 showing the coupling element in position before assembly is completed; and

FIG. 9 is a view similar to that of FIG. 8 after assembly is completed.

Referring now in greater detail to the embodiments of the invention illustrated in the drawings, and with particular reference to the embodiments illustrated in FIGS. 1 to 4 of the drawings, the same show a frame, generally designated as **10**, which includes frame sides, **12** and **14**, having mitred end faces, **15**, disposed at a 45° angle to the side faces thereof. Each of the frame sections **12** and **14** is provided with a bore, **16**, extending through the mitred portion, which is counter-sunk or enlarged at its outer end, as at **18**, and at its inner end, as at **20**, to form the respective shoulders, **22** and **24**, at the inner ends of the respective enlarged bore portions **18** and **20**. Each bore **16** is disposed with its longitudinal axis at right angles to the mitred faces of the frame side, and shoulders **22** and **24** are disposed at substantially right angles to such longitudinal axis.

A coupling element, generally designated as **26**, is disposed with half of its length in each of the two facing bore portions **20**. Such coupling element **26** comprises a tubular, substantially cylindrical body, **28**, having the threaded bore, **30**, which may preferably be countersunk at each end, as at **32**, to form a sharp edge, **34**. The coupling element **26** also includes longitudinally-extending, diametrically opposed fins, **36**, which preferably taper from the center point toward the ends of the body **28**, and are each formed with a knife edge, **38**. The cylindrical body **28** may also be provided with grooves, **40**, extending circumferentially thereof between fins **36**, in each half of its length.

Set into the outer, enlarged bore portions **28** there may be set an eyelet, **42**, having an outer beaded edge, **44**, disposed at an angle of 45° to the longitudinal axis of the eyelet and which is adapted to overlie the marginal edge portions of the enlarged bore section **18** of bore **16**. The inner edge of each eyelet may be tapered, as at **44**, to a reduced outlet opening and to rest against the shoulder **22**. A screw, **46**, having a tapered head, **48**, is inserted into each eyelet **42** and threaded into the adjacent end of the coupling element **26**, which is disposed in the inner bore of the frame portion.

It will be apparent that as screws **46** of the two frame sections **12** and **14** are threaded in the coupling element **26** and tightened in place, the two frame sections **12** and **14** will be moved together until their mitered faces are in tight contact. The fins **36** of the coupling element **26**, with their knife edges **38**, will cut into the walls of bore portions **20**, to immobilize the coupling within enlarged bore portions **20** and maintain the two frame sections **12** and **14** rigidly in position and inhibit their relative rotation.

If desired, one or more registering recesses or bores, **49**, may be formed in the mitered faces of the adjacent frame sections **12** and **14** into which a pin, **50**, may be set, to thereby further assure inhibition of the relative twisting of the two frame sections **12** and **14**.

In the embodiment of FIGS. 5 through 9, inclusive, a simpler and more economical coupling element is disclosed. The coupling element, generally designated as **60**, may comprise a pair of substantially alike semi-cylindrical sections, generally designated as **62**, each of approximately omega shape having an arcuate portion, **64**, of a cross-section slightly greater than a semi-circle with outwardly-curved marginal edge portions, **66**. Each semi-

cylindrical portion **62** is provided, preferably adjacent one end, with alined, outwardly-extending wings, **68**, and with a plurality of circumferentially-extending indentations on each half of its outer surface which form projections, **70**, on the interior thereof, and with one or more circumferentially-formed embossments, **72**, on each half of its outer surface.

The coupling is formed by superposing two of the semi-cylindrical sections **62** over one another with their curved edge inner-fitting with the wings of each such semi-cylindrical sections folded over the other, to form a cylinder of approximately irregular circular shape, and of a diameter to fit loosely within the inner bore enlargements **18** and **20** of bore **16** of adjacent frame sections **12** and **14**. The bore of the coupling formed by the joining of semi-cylindrical sections **62** is of lesser diameter than the screws **46** and the inner circumferential embossments or projections **70** may serve as threads for such screws.

With this form of coupling, the screws **46**, as they are threaded into the ends of the coupling, engage the circumferential embossments **70** and at the same time spread the two semi-cylindrical sections **62** apart, so that they press against the wall of the bore enlargements **18** or **20**, as the case may be, and also press the external embossments, **72**, into the walls of the bores **18** and **20**, to thereby securely anchor the coupling in the assembled frame section.

While the coupling element of FIGS. 5 to 9 inclusive has been described as being formed of two assembled halves, it may here be stated that such coupling may be formed in one piece in the form of a rolled tube whose edges overlap and which is expanded under pressure of screws **46** to be pressed against and into the wall of the bore enlargements **18** and **20**.

This completes the description of the knockdown frame construction of the present invention. It will be readily apparent that the frame sides of the assembly may be readily and economically processed to provide them with the requisite bores; that the fittings used in assembling the frame sides are of a nature that they may be readily and economically mass-produced; that the frame sides and fittings may be easily and simply assembled by the mere use of a screwdriver, without requiring any skill therefor; and, finally, that the assembled frame is strong, sturdy and rigid and without any surface features that would in any way detract from its appearance.

It will be further apparent that numerous modifications and variations may be made in the knock-down frame of the present invention, by anyone skilled in the art, in accordance with the principles of the invention hereinabove set forth, without the use of any inventive ingenuity.

What I claim is:

1. A knock-down frame assembly comprising frame sides each having mitered ends adapted to have the face of a mitered end thereof abut the face of the mitered end of another, each said frame side having an aperture bored through its mitered end, said aperture having its longitudinal axis at right angles to the face of the mitered end thereof, the apertures of abutting mitered ends of said sides registering with one another, a coupling element disposed with part of its length extending into the aperture of each of a pair of abutting mitered ends through the openings in the abutting faces of said frame sides, means limiting the movement of said coupling into each of said apertures, each end of said coupling having threaded means adapted to be engaged by a cooperating threaded member, and a cooperating threaded member inserted into each said aperture through the other end thereof threadedly engaging the adjacent threaded end of said coupling in said aperture.

2. The frame assembly of claim **1**, wherein means are provided on said coupling element engaging the walls of said apertures when said mitered ends are connected in abutting relation by the engagement of said threaded

members on said threaded means, to thereby immobilize said element in said apertures.

3. The frame assembly of claim **1**, wherein said means limiting the movement of said coupling element in said apertures comprises enlargement of the end portion of each of said aperture opening into said mitered face forming an interior shoulder within said aperture, said shoulder engageable by an end of said coupling element.

4. The frame assembly of claim **3**, wherein said threaded means comprises threaded recesses in each end of said element and said threaded members comprise headed screws.

5. The frame assembly of claim **2**, wherein said coupling means comprises a tubular body and said means engaging said wall comprises fin-like projections on said body, said projections tapering from a point opposite the center of said body towards the ends thereof and having tapered edges adapted to cut into the wall of said apertures.

6. The frame assembly of claim **4**, wherein the other end of each of said apertures is enlarged to form an interior shoulder at said end, said shoulder retaining a head of a screw inserted into said aperture.

7. The frame assembly of claim **6**, wherein an eyelet is inserted in said other end of said aperture, said eyelet having a restricted inner end resting on said shoulder and a flange at its outer end overlying the marginal edge portion of said enlargement at said other end of an aperture.

8. The frame assembly of claim **4**, wherein said coupling element comprises an approximately tubular body formed of a pair of semi-cylindrical sections, and means loosely inter-engaging said sections on one another to form a tube and said threaded recessed ends of said coupling comprises a plurality of spaced, circumferentially-disposed embossments on the inner surface of each said section, said tubular body having an outer diameter less than the diameter of a bore enlargement and an inner diameter less than one of said screws, said sections adapted to be spread apart by said screws, into frictional engagement with the wall of said bore enlargements.

9. The frame assembly of claim **8**, wherein said means engaging said sections on one another comprises a flexible wing extending from the edges of each said section at one end thereof and folded over the other of said sections.

10. The frame assembly of claim **8**, wherein each said section is formed with at least one circumferentially disposed corrugation on its exterior adjacent each end, said corrugation adapted to press into the wall of the enlarged aperture section in which it is disposed when said sections are spread apart by the screws received thereinto.

11. A kit for forming a frame, of the character described, comprising a plurality of frame sides each having mitered ends having faces adapted to fit against the face of the mitered end of another of said frame sides, each said frame side having an aperture formed through the mitered end portion thereof, at right angles to the mitered face thereof at said end, the end portion of said aperture opening into said face being enlarged, a plurality of couplings each of greater length than the enlarged portion of an aperture and adapted to fit into the enlarged aperture portions of a pair of frames disposed with their mitered faces in contact with one another, and means insertable through the other end of an aperture and engageable against the frame side thereof adapted to adjustably engage the end of an element within said aperture whereby the adjustable engagement of said engageable means inserted into the apertures of two frame sides fitted over one of said element will pull said frame sides towards one another.

12. The kit of claim **11**, wherein means are provided on said element for pressing the element against the wall of the apertures within which it is disposed when the frame sides thereof are drawn together.

13. The kit of claim **11**, wherein said elements are hollow at least at their ends and internally threaded at

their hollow portions and said engageable means comprise headed screws.

14. The kit of claim **13**, wherein the other ends of said apertures are enlarged to form external shoulders, the heads of said screws engageable against said shoulders.

15. The kit of claim **14**, including an eyelet disposable within each said other aperture enlargement, said eyelet having an inner flange adapted to overlie said shoulder and to have said screw head engage thereagainst.

16. The kit of claim **13**, wherein said element comprises a pair of semi-cylindrical sections adapted to be disposed over one another to form a tube, each said section having circumferentially-disposed spaced internal corrugations at each end thereof, said corrugations adapted to serve as threads of engagement by a screw, said sections when superposed on one another forming a tube of an inner diameter less than the diameter of a screw and not exceeding the diameter of the enlarged aperture portion and adapted to be spread apart by the engagement of screws therein to be forced against the walls of said enlarged aperture portions.

17. The kit of claim **16**, wherein each said section is formed with at least one circumferentially-disposed external corrugation adapted to press into the wall of the enlarged aperture portion in which said section end is disposed when one of said screws is engaged therein.

18. The kit of claim **16**, wherein means are provided on each said section for expansively engaging it on the other of said sections.

19. The kit of claim **18**, wherein said means expansively engaging said semi-cylindrical sections on one another comprise at least one flexible wing extension on each said section foldable over the other of said sections when said sections are superposed to form a tube.

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