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(54) Improvements in or relating to workbenches.

(57) A portable workbench has two elongate vice jaw members (4, 12) mounted upon a support structure (1, 2). One of the jaw members (4) is movable along the support structure towards and away from the other jaw member (12). The other jaw member (12) is removable from the support members and can be placed into one or other of several positions spaced by different amounts from the one jaw member (4). The removable jaw member (12) is also replaceable by a work surface that is attachable to the support structure (1, 2) and is clamped in position by the one jaw member (4). The work surface may carry a guard for use with a circular saw.

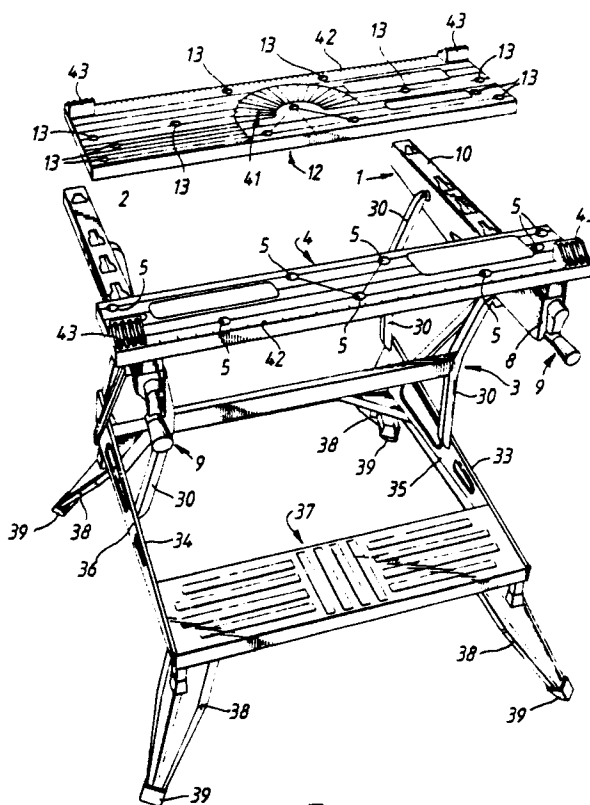


FIG.1

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Improvements in or relating to Workbenches

This invention relates to workbenches and has particular reference to portable workbenches especially to portable workbenches that are also collapsible to enable them to be carried by the user from one site to another.

It has been proposed, in U.S. Specification No. 4,061,323, to provide a portable, collapsible workbench with front and rear elongate vice jaw members sized to provide the entire work surface of the bench. However, that surface is adequate for a limited range of purposes only.

U.S. Specification No. 4,061,323 also discloses a construction in which the rear vice jaw member is adjustable in position relatively to the front vice jaw member and has several preset positions in which it can be located. That feature increases the range of article sizes that can be clamped between the jaws.

U.S. Patent Specification No. 4,069,849 discloses a portable, collapsible workbench with front and rear elongate vice jaw members which are used to clamp between them a fence member including a mounting for a router. This construction relies on both the jaw members to clamp the fence member. Consequently, because of the very limited extent to which the jaw members can be opened up, fence members of a small width only can be accommodated between the jaw members. That restricts the size of the available work surface to a relatively small area.

Accordingly, it is an object of the present invention to provide a workbench able to provide a much larger work surface than has hitherto been possible and which can be used for a greater range of different purposes.

According to the present invention, a workbench comprises to elongate vice jaw members, a support structure upon which the jaw members are mounted, one of the jaw members being movable along the support structure towards and away from the other jaw member which is removable from the support structure, characterised in that there is provided a work surface adapted to be removably secured to the support structure after removal of the removable jaw member and to be clamped in position on that structure by the movable jaw member.

The removable jaw member and the work surface may have parts which engage with surfaces on the support structure to attach them to the latter structure.

The parts and the surfaces may be such that attachment and removal of the removable jaw member and the work surface are effected by sliding the removable jaw member or the work surface along the support structure to a position in which the removable jaw member or the work surface is detachable from the support structure.

The support structure may comprise two spaced parallel support members each formed with an aligned series of key-hole-shaped apertures in which the parts engage.

The removable jaw member may have at least two parts each engageable with one hole in each support member.

The work surface may have at least two pairs of parts each pair being positioned to engage a pair of holes on each support member.

At least two immediately adjacent holes on each support member may be spaced apart along the length of the member by a distance that is different from that between other immediately adjacent holes on the same member.

By way of example, an embodiment of the invention will now be described in greater detail with reference to the accompanying drawings of which:

Fig. 1 is a perspective view of a portable collapsible workbench with one jaw shown detached from the workbench,

Fig. 2 is a plan view of a part of the workbench,

Fig. 3 is an underneath view of a vice jaw member of the workbench,

Fig. 4 is a side view of an attachment slide and part of a vice member,

Figs. 5 and 6 are respectively a plan view and an underneath view of the attachment slide,

Fig. 7 is a perspective view of a bench top fitment,

Fig. 8 is a perspective view of a saw and router table fitment, and

Fig. 9 is a perspective view of the workbench in an alternative height configuration.

The portable, collapsible workbench shown in Fig. 1 is of a construction generally similar to that of the workbench described in U.K. Patent Specification No. 1,471,118 except that in the latter the front vice jaw member is fixed permanently relatively to the frame of the workbench and the rear vice jaw member is movable towards and away from the front jaw member whereas in the embodiment shown in Fig. 1, the rear jaw member is removable from the frame and the front jaw member is movable towards and away from the rear jaw member.

The workbench shown in Fig. 1 also embodies the dual height feature described in U.K. Specification No. 1,471,118.

The workbench shown in Fig. 1 comprises two spaced, parallel support members 1, 2 that are mounted upon the base 3 of the workbench. Each support is of generally channel shaped configuration and mounted between the front ends of the members 1, 2 is the front vice jaw member 4.

The member 4 is of elongate rectangular form and extends for the full width of the workbench. The member 4 is of a laminated wood construction and has holes 5 through it at spaced sites over its surface. The purpose of the holes 5 will be described below. Additionally, the clamping edge (the upper edge as seen in Fig. 2) has a shallow groove along it from side to side.

Housed within the support members 1, 2 are screw-threaded rods 6, 7 that extend through and are supported against axial movement by front walls 8 of the support members 1, 2 and are attached to handles 9.

In the upper surfaces 10 of the supports and aligned with the rods 6, 7 are elongate slots (not shown) through which extend slider members (not shown) on the undersurface of the front jaw member 4. The slider members are shaped to provide guide surfaces that coact with the sides of the elongate slots to guide the jaw member 4 during movement. The slider members also have threaded bores through which the threaded rods 6, 7 extend. The slider members are attached to the jaw member 4 by single point attachments, for example screws or bolts that permit limited pivotal movement of the jaw member 4 with respect to the rods 6, 7.

The general method of attachment and construction of the slider members is similar to that described in U.K. Patent Specification No. 1,267,034.

Each of the upper surfaces 10 of each support member 1, 2 also has along its length a series of spaced 'keyhole' shaped holes 11 and those form attachment points for a rear jaw member 12.

It will be noted from Fig. 2 that the spacing along the support members 1, 2 of the lower (as seen in Fig. 2) three holes 11 is constant whilst that between the uppermost holes 11A and the immediately adjacent uppermost of the holes 11 is different, being much greater as shown.

All the holes 11 and 11A are of generally similar key-hole shape having larger sized lower aperture 20 and narrower slot shaped upper aperture 21. However, the holes 11A have both a smaller aperture 20 and a shorter slot-shaped aperture 21.

The rear jaw member 12 is generally similar in size and shape to jaw member 4, being of elongate rectangular form and of a laminated wood construction. Jaw member 12 also has holes 13 at spaced sites over its surface. The position of the holes 13 may correspond with those of the holes 5.

Secured to the underneath of jaw member 12 are support blocks 14 each carrying a fitment 15 - (Figs. 4, 5 and 6) that co-operates with one or other of the keyhole slots 11 to locate jaw member 12 in place. The blocks 14 are located closer to the upper (as seen in Fig. 3) edge of the rear jaw member 12 than to the other edge. The upper edge is the clamping edge of the jaw member 12 and has a shallow groove along it from side to side and this groove in conjunction with a similar groove in the front jaw member 4 facilitates the clamping between the vice jaw member of rounded elongate articles, for example pipes. The fitment comprises a lower coned part 16 whose upper portion is hexagonal and which is joined to an upper hexagonal part 17 via a cylindrical neck part 18 of reduced size as compared with parts 16 and 17. The fitment is fixed to the jaw member by a bolt 15a that passes through the jaw member and the block 14 and into the threaded bore 19 of the fitment. The block 14 has a recess on its lower face that accommodates the upper hexagonal part 17.

The rear jaw member 12 is located upon the support members 1, 2 by engaging the fitments 15 in selected ones of the keyhole shaped holes 11. Fitments 15 are engaged in the holes 11 by entering the coned parts 16 through the larger sized apertures 20 of the holes 11 and then sliding the jaw member 12 rearwardly so that the neck part 18 moves into the slot-shaped apertures 21 of the holes, the coned parts 16 lying beneath the upper surface 16 of the support members 1, 2 and the hexagonal parts 17 lying above the upper surface. The assembly then forms a vice with elongate jaw members 4, 12 of which the former is movable towards and away from the latter by rotating the handles 9.

The maximum outside diameter of the coned parts 16 is such that they can readily be entered through the apertures 20 of the holes 11 but not through the aperture parts 20 of the holes 11A. That prevents a user locating the rear jaw member 12 at the rear ends of the support members 1, 2 at which position there would be inadequate support for the blocks 14 of the member 12.

Jaw member 4 may be moved in a parallel orientation with respect to jaw member 12 by equal rotation of the handles 9. However, by independent rotation of the handles 9, the jaw member 4 can be inclined with respect to jaw member 12. This in-

clination is permitted by the single point attachment of the sliders and the degree of inclination is limited only by the limits of movement of the sliders along the slots.

Removal of the rear jaw member 12 permits its replacement by, for example, a bench top of a larger surface area giving a user a greater area on which to work, or a bench top carrying bench mounted tools, or a saw table or a combined saw and router table.

A typical top 22 is shown in Fig. 7. The top is of rectangular form and may be of laminated wood construction. To the undersurface of the top 22 adjacent each side thereof are pairs of fixed blocks similar to block 14, each carrying a fitment similar to fitment 15. In the example shown in Fig. 7, four such blocks and fitments are used, the spacing between the fitments on the blocks of a pair of blocks on the same side of the undersurface being, as can be seen from Fig. 7, equal to that between hole 11A and the lowermost of the three lower holes 11.

Moreover, the fitments of each block of a pair are sized differently as regards the outside diameter of the coned parts 16. Blocks 14A nearest the lower (as seen in Fig. 7) edge of the bench top 22 have fitments 15 identical in size with those of the rear jaw member 12 whilst the blocks 14B adjacent the other upper edge have fitments 15 whose coned parts 16 are of a smaller outside diameter to pass through the smaller apertures 20 of the holes 11A.

That ensures that the top 22 can be located on the support structure in one position only. That one position is selected to ensure maximum support for the top 22 by the support structure and by the base 3 to give stability to the workbench.

The bench top 22 is placed on the supports 1 and 2 so that the fitments engage keyholes 11A and the immediately adjacent holes 11 in the manner described above and the user by rotating handles 9 moves the front jaw member 4 towards the bench top to move the cylindrical neck parts 18 into the slots 21 of the holes and thereby clamp the bench top 22 firmly in place.

The bench top may be used as an extended work surface, or it may carry bench mounted tools, for example a drill stand, a belt sander, a planer thereby forming a 'work' centre.

The removable rear jaw member 12 may also be replaced by a saw and router table 23 shown in perspective view in Fig. 8.

The table 23 may be of a laminated wood construction but is preferably moulded from a suitable plastics material, for example high impact polystyrene, and has an upper surface on which is mounted a rip fence 24 movable across the surface of the table with respect to a transverse slot 25

though which projects the blade (not shown) of a circular saw when secured to the underneath surface of the table. Adjacent the slot 25 is a round hole 26 for the reception of the shaft and cutter of a router when secured to the undersurface of the table.

The table 23 also has holes 27 at other sites for the reception of other fittings for example a mitre guide 28 that is secured by a bolt that passes through the guide and the hole in the table at the site selected for the guide.

Secured to its undersurface, the table 23 has blocks 14A, 14B and fitments 15 similar to blocks 14A, 14B and fitments 15 referred to above in connection with Fig. 7. The saw/router table is secured to the workbench by first removing the rear jaw member 12 and then engaging the fitments on the undersurface of the table in the holes 11A and in the lowermost of the holes 11 in the manner described above and then operating the handles 9 to move the front jaw member 4 into clamping engagement with the table 23. During such clamping engagement, there may be some movement of the table 23 in the fitments as they move into position at the ends of the narrow slot-shaped apertures 21 of the holes 11. The table 23 is thus adequately and securely supported.

The table 23 is also adapted to receive a guard 29 for the circular saw blade and another guard - (not shown) for the router cutter.

The workbench preferably has a base structure that enables the bench to be readily carried by a user from one site to another but this is not essential. The bench could be a static fitting in a work shop.

Preferably, also, the base structure is collapsible, the bench shown in Fig. 1 having a base structure that is collapsible. The structure is also of dual height.

The base structure 3 comprises a pair of spaced, generally H-shaped frames 30 pivotally connected to the support members 1, 2 at points 31 and 32 respectively and to lower frame members 33, 34 at points 35, 36 respectively. The frame members 33, 34 extend forwardly as seen in Fig. 1 and their ends are joined by a wide surfaced step 37. The construction and arrangement of the base structure 3 enables the workbench to be used in the erection position shown in Fig. 1 and to be collapsed to a folded condition in which the frames 30 lie parallel and close to the lower frame members 33, 34 with the jaw members 4, 12 and their support members 1, 2 lying in a plane parallel to that containing the frame 30. Catches not shown are provided to lock the base structure in its erected condition and these must be released before the structure can be collapsed.

The lower frame members 33, 34 also have four pivotally attached legs 38 at the front and rear corners. Each of the legs 38 is movable between an outwardly folded position as shown in Fig. 1 and an inwardly folded, inoperative position. In the Fig. 1 position, the bench rests upon rubber feet 39 on the lower ends of the legs 38 and the bench is in its higher position.

With the legs 38 folded inwardly, they locate inside the lower frame members 33, 34 and the bench rests upon feet 40 on those frame members. This is the lower position of the bench and is shown in Fig. 9.

A spring clip (not shown) is associated with each leg 38 to retain the leg in its outwardly folded position and in its inwardly-folded position, the clip being deflected as the leg is moved from one position to the other.

Further description of the structure just described is contained in U.K. Specification No. 1,471,118.

It will be appreciated that the support members 1, 2, may have one series of spaced holes for use only with the removable rear jaw member and another set for use only with the bench top and a saw/router table.

Additionally, other means of attaching the removable rear jaw member, the bench top and saw/router table to the support members than the holes and attachment fittings described above may be used.

For the convenience of the user, the upper surfaces of the vice jaw members 4, 12 may carry markings including a protractor 41, a ruler 42.

The holes 5 and 13 referred to above are intended to receive the spigots of mounting blocks 43. Fig. 1 shows four such blocks 43 located at the corners of the vice jaw members as shown. The blocks when in those positions can be used to clamp articles in position by rotating handles 9 to move the front jaw member 4 towards rear jaw member 12. The position of rear jaw member 12 is selected according to the front-to-back dimension of the article to be clamped by selecting the appropriate ones of the holes 11 to be used to locate jaw member 12.

Claims

1. A workbench comprising two elongate vice jaw members, a support structure upon which the jaw members are mounted, one of the jaw members being movable along the support structure towards and away from the other jaw member which is removable from the workbench characterised in that there is provided a work surface adapted to be removably secured to the support structure after removal of the removable jaw member and to be clamped in position on that structure by the movable jaw member.

2. A workbench as claimed in claim 1 characterised in that the removable jaw member and the work surface have parts which engage with surfaces on the support structure to attach them to the latter structure.

3. A workbench as claimed in claim 2 characterised in that attachment and removal of the removable jaw member and the work surface are effected by sliding the jaw member or the work surface along the support structure to a position in which the removable jaw member or the work surface is detachable from the support structure.

4. A workbench as claimed in claim 3 characterised in that the support structure includes two, spaced parallel support members each formed with an aligned series of key-hole shaped apertures in which said parts engage.

5. A workbench as claimed in claim 4 characterised in that the removable jaw member has at least two parts each engageable with one hole in each support member.

6. A workbench as claimed in claim 4 characterised in that the work surface has at least two pairs of parts, each pair being positioned to engage a pair of holes on each support member.

7. A workbench as claimed in claim 6 characterised in that each series of holes includes one adjacent the movable jaw and another adjacent that end of the support member remote from the movable jaw member and in that the spacings between the parts of each pair of parts is such that those parts are engageable with said one hole and said another hole only.

8. A workbench as claimed in claim 7 characterised in that each of said another holes is of a size such that the parts on the removable jaw member cannot engage therewith.

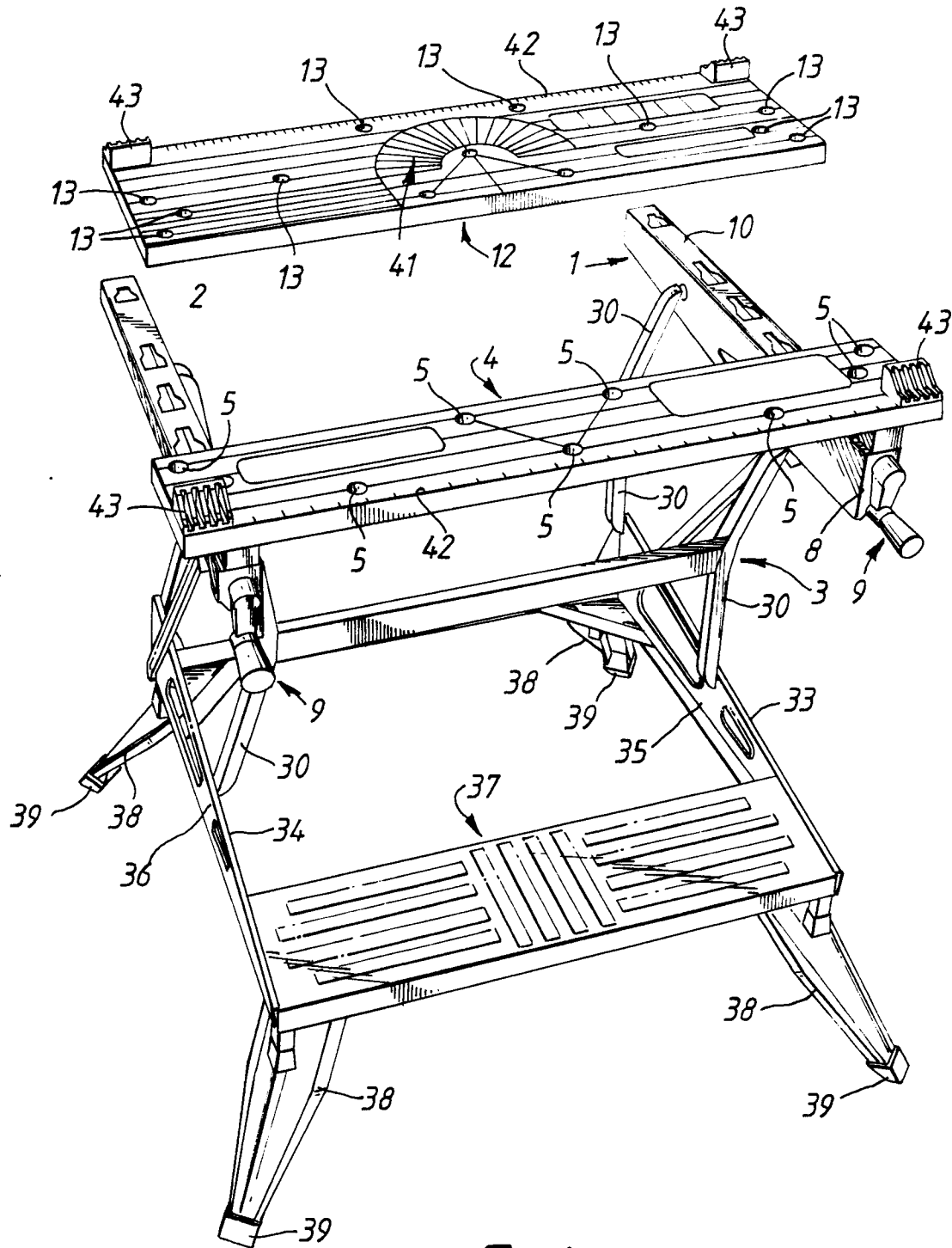
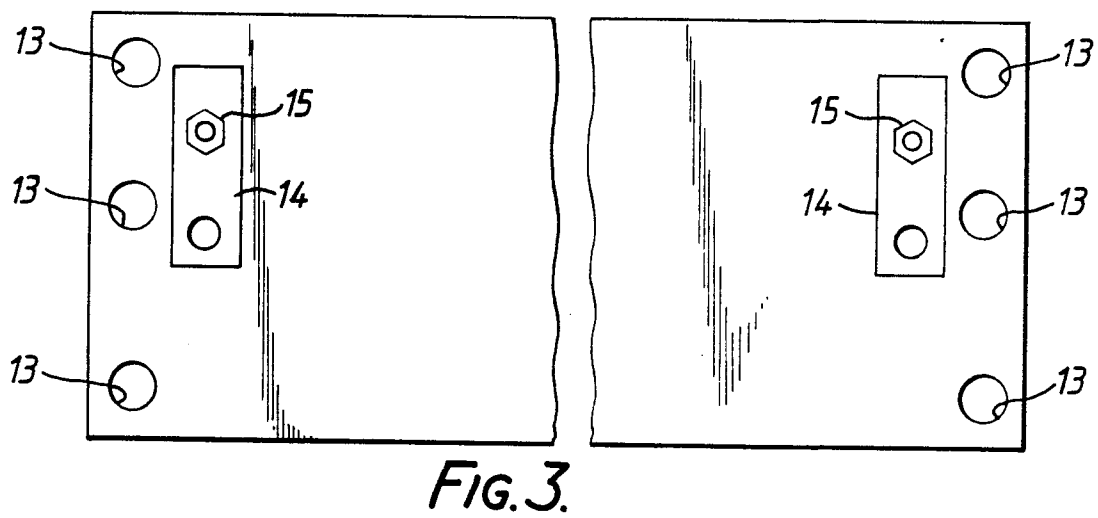
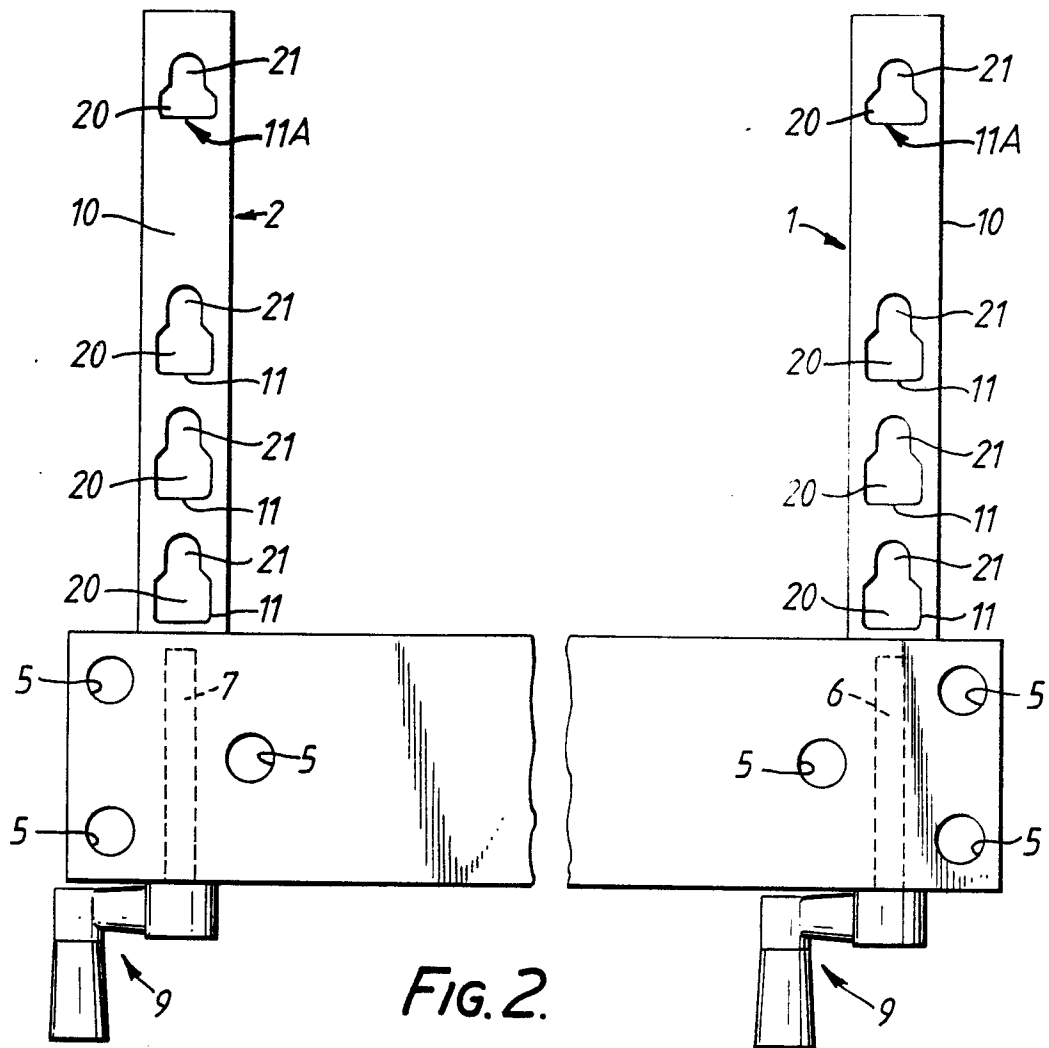


Fig. 1.



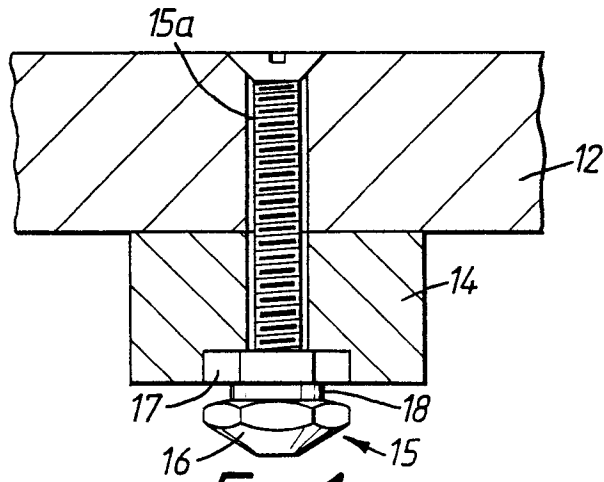


FIG. 4.

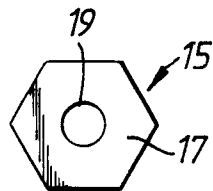


FIG. 5.

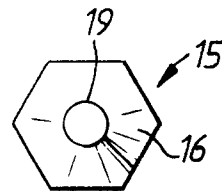


FIG. 6.

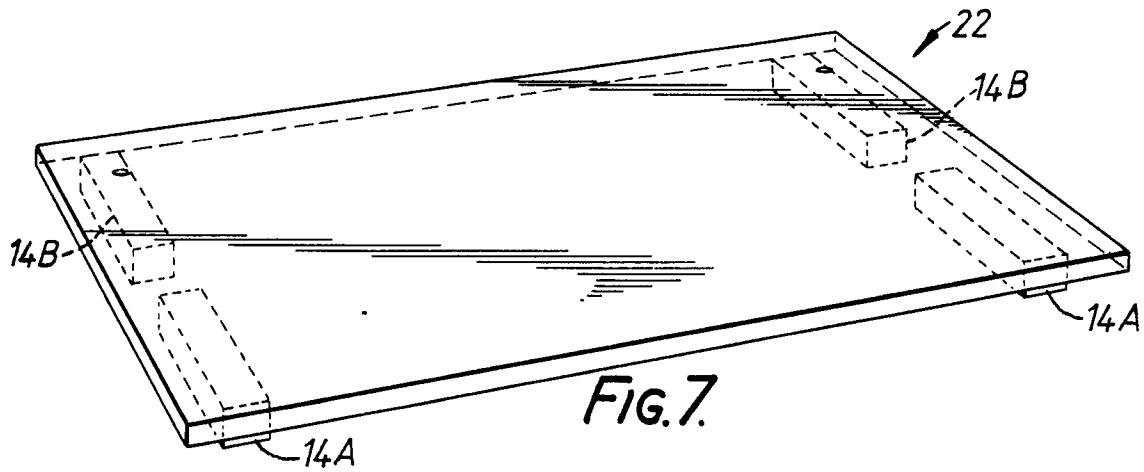


FIG. 7.

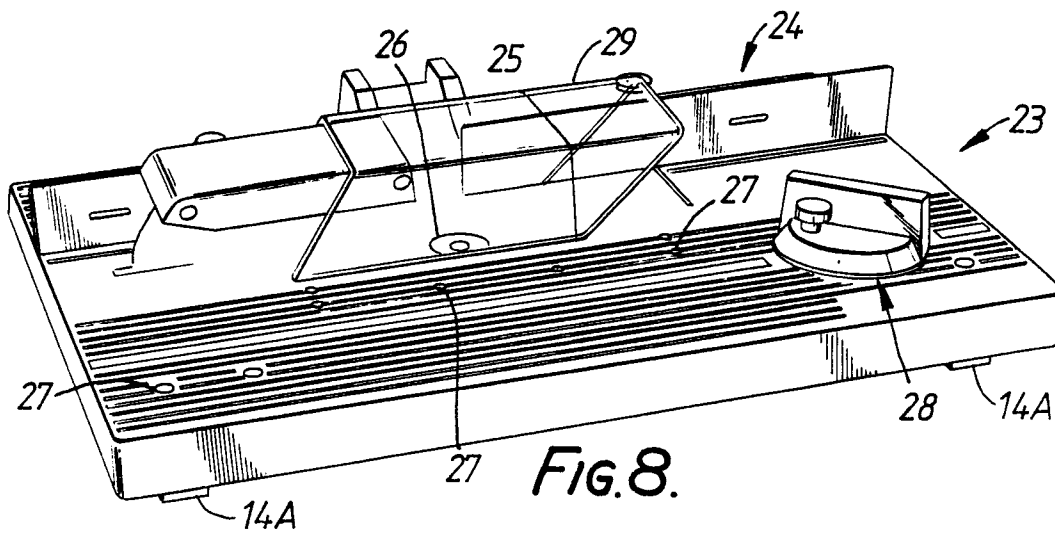


FIG. 8.

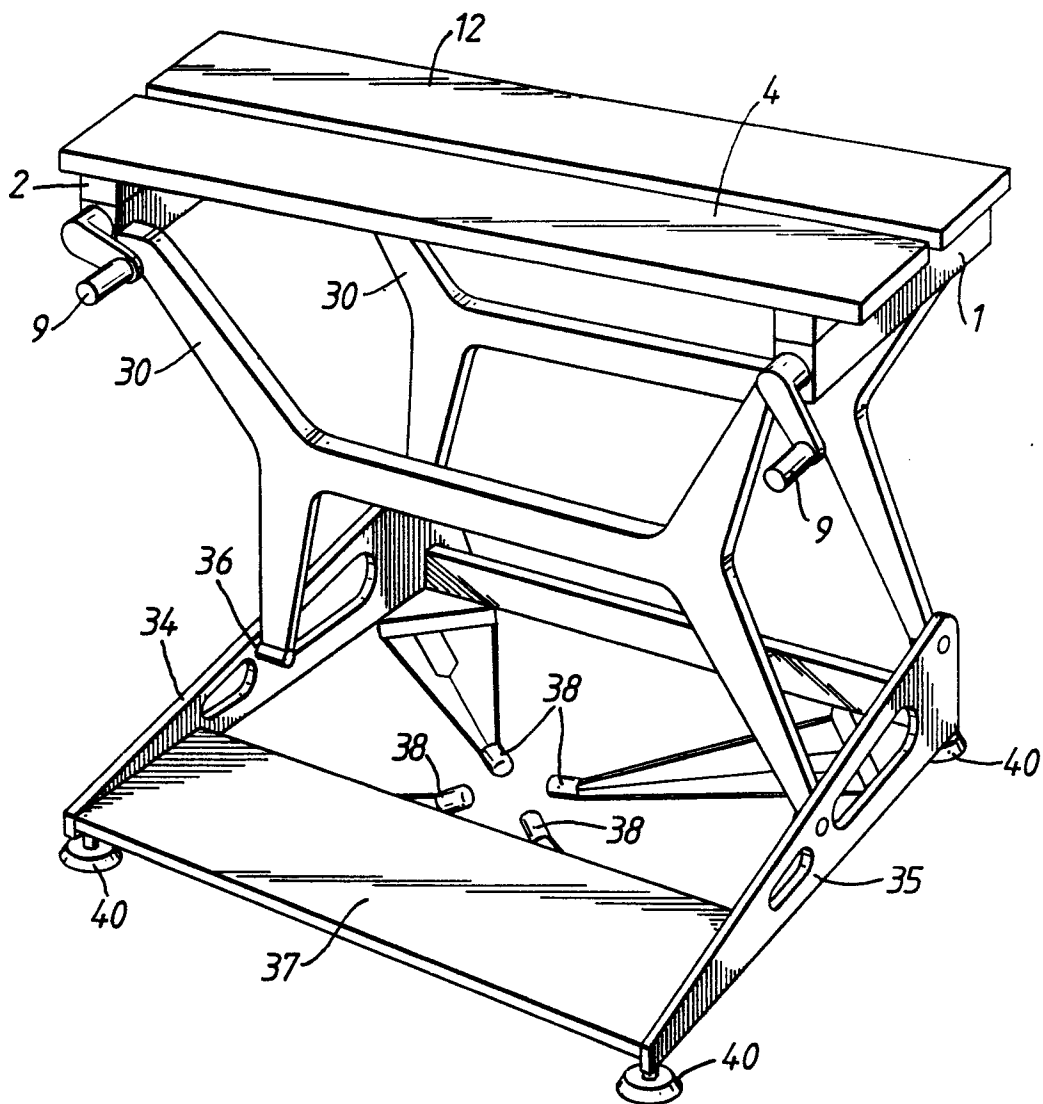


FIG. 9.



DOCUMENTS CONSIDERED TO BE RELEVANT			EP 86307471.2
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. 4)
X	US - A - 4 415 149 (REES) * Totality * --	1,2	B 25 H 1/04
D,A	US - A - 4 061 323 (BEEKENKAMP) * Totality * --	1	
A	US - A - 4 127 260 (HICKMAN) * Fig. 6,7; column 7, lines 28-59 * --		
A	GB - A - 1 582 841 (INVENTEC) * Totality * ----		
			TECHNICAL FIELDS SEARCHED (Int. Cl. 4)
			B 25 H 1/00
The present search report has been drawn up for all claims			
Place of search VIENNA		Date of completion of the search 15-12-1986	Examiner TOMASELLI
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	