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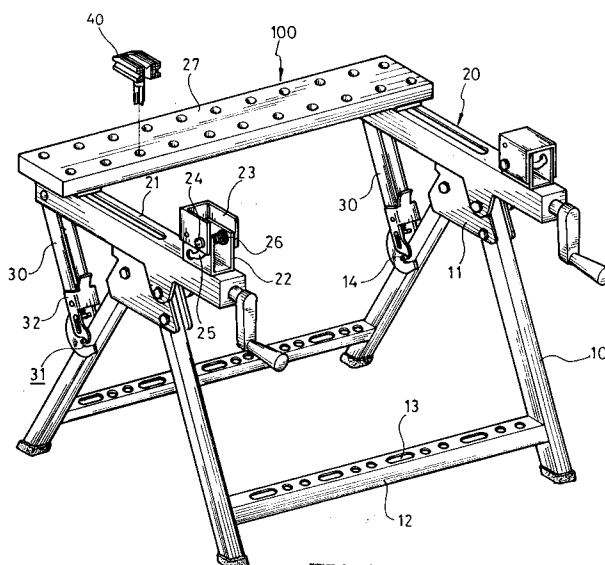
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London, WC1V 7LE(GB)(54) **Worktable.**

(57) A worktable comprises two pairs of legs (10), a tabletop, and a pair of support arms (30). The top end of each pair of legs is pivotally joined by a joint means (11) which further pivotally connects a receiving frame (21) of the tabletop at its upper portion. Each of the receiving frames is provided with a pair of fixtures, the distance between the two fixtures being adjustable by a threaded rod disposed inside the receiving frame. Each of the support arms is pivotally connected to the receiving frame at its top and while a lower end is provided with a pair of notches (31) permitting it to be attached to the

forward extended legs by engaging the notches with locating pins (14) on the legs. Upon detaching the support arm from the locating pin on the legs, the legs may be folded toward each other and the tabletop may be lifted to an upright position alongside the folded legs. Each of the fixtures includes an upper part (23) and a lower part (22), the lower part being positioned on the receiving frame while the upper part is pivotally connected to the lower part and allows a top board (27) mounted thereon to be adjusted to an upright position.

**FIG 1****EP 0 474 935 A1**

The present invention relates to a workbench or worktable, and in particular relates to a worktable which is foldable for easy and convenient storage when not in use and portability. Most worktables are formed with fixed dimensions, and workpieces or articles to be worked on are tightly fastened to the tabletop by clamping means thereon to facilitate the working operations to be performed on it. Worktables with fixed dimensions occupy a very large storage space and are not convenient in either carriage or storage, and consequently, do not meet the requirements of portability nor can they be easily moved to a storage room when they are not in use.

There is a kind of folding worktable designed to have a set of telescopic tubes or foldable linkage provided between two pairs of table legs. The worktable may be folded to reduce its volume for storage by upwardly lifting one pair of legs while matching the folding action of the telescopic tubes or of the linkage. However, this folding worktable involves many complicated parts which make it difficult to manufacture and assemble, expensive in production, and inconvenient in use. Consequently, it is unacceptable by most users.

It is therefore, a main object of the present invention to provide a worktable which can overcome and eliminate the drawbacks of the conventional worktables and thereby greatly improves the practicability of worktables.

It is the aim of the present invention to provide a worktable which includes two pairs of legs permitted to be folded toward each other, and a tabletop with one end pivotally connected to a support arm while the other end of which may be independently swung.

In accordance with a first aspect of the invention there is provided a worktable comprising:

two pairs of legs, a table top supported by the legs,

the legs of each said pair being pivotally interconnected by a joint means at their upper ends, and

said tabletop including a pair of receiving frames, pivotally connected to said joint means and having a pair of clamping members disposed thereon, the distance between said members being adjustable by a threaded rod to enable articles to be firmly clamped therebetween, and a pair of support arms having upper ends pivotally connected to forward end portions of the respective receiving frames, the lower ends of the support arms comprising locking means for releasable engagement with locating pins provided on the forward most legs of the pairs of legs for said support arms to support said tabletop to maintain it in a level condition, said locking means including slidable fixing means movable between open and

closed positions for releasing and locking the support arm, respectively, with respect to said locating pin, and disengagement of the support arms from said locating pins permitting said legs to pivot toward each other and said tabletop to be pivoted upwardly and thereby the worktable to be folded is substantially flat.

It is another object of the present invention to provide a worktable, the tabletop of which includes one pair of fixtures which are movable in relation to each other and can be disposed either in a level position or in a vertical position for clamping or fixing articles to be supported by the worktable.

In accordance with a second aspect the invention provides a worktable comprising a pair of elongate clamping members, support means carrying the clamping members and including means for moving said members towards and away from each other in a direction transverse to the length of said members, each clamping member being mounted on the support means by hinged mounting fixtures including upper and lower parts connected for relative pivotal movement between two positions substantially 90° apart, whereby the clamping members are independently and selectively adjustable about generally parallel longitudinal axes and between positions substantially level with the plane containing said axes and substantially perpendicular to said plane.

The worktable described herein further comprises a plurality of auxiliary clamps disengagably mounted on top boards of the worktable in order to clamp articles. Other features and advantages of the invention may become apparent from the following detailed description given with reference to the accompanying drawings wherein:-

Fig. 1 is a perspective of a worktable in accordance with the invention and showing the legs in an extended position, with one of the top boards having been omitted to more clearly illustrate the way the fixtures can be disposed upright for clamping an article;

Fig. 2 is a side view showing the worktable of the invention in a folded position;

Figure 3 is a fragmental side view showing the alternative flat and upright positions of the fixtures and top boards;

Figure 4 is a three-dimensional perspective showing a support arm in detail; and

Figure 5 shows the manner in which the retaining pin in the fixtures is operated.

Illustrated in Fig. 1 is a worktable 100 having two pairs of legs 10, a tabletop 20, and one pair of support arms 30. A joint means or bracket 11 is attached to the legs of each pair of legs 10 to pivotally join the same at their top ends while it also pivotally mounts a support or receiving frame 21 of the tabletop 20. As viewed in Fig. 1, the

righthand leg is fixed to the bracket 11 and the lefthand leg is pivoted to the bracket. Two tool racks 12 act as cross struts and extend transversely between the corresponding legs of the two pairs of legs 10, the racks being provided with openings with different sizes and configuration for receiving tools (not shown) so that they can be accessed easily whenever they are needed.

The tabletop 20 includes two receiving frames 21 respectively pivoted on the brackets at the tops of the legs fixed thereto. On each of the receiving frames 21, a pair of fixtures in the form of two-part hinge mounts are provided for attaching top boards 27 thereon. One of the hinge mount fixtures is fixedly connected to the receiving frame whereas the other fixture is longitudinally movable and is connected to a nut engaged with a threaded rod. The threaded rod (Fig. 3) is installed inside the receiving frame 21, and crank rocker handles are fastened to the rods and provided outside the working end of each receiving frame 21, so that they can be used to adjust the distance between the two fixtures and hence the top boards 27, for tightly clamping and releasing an article between the top boards. Since the above-mentioned adjustment structure is similar to that of a conventional worktable, it is not described in any detail herein.

Referring to Fig. 1, the worktable 100 of the present invention further comprises a plurality of auxiliary chucks or clamps disengageably mounted on the top boards 27 of the worktable 100. With the auxiliary clamps 40 mounted thereon, the worktable 100 may clamp articles of various sizes and shapes. The top boards 27 are provided with a plurality of engaging holes to receive the auxiliary clamps 40 therein, in a manner known per se.

The worktable 100 of the present invention is characterised by including the two support arms 30 and by being provided with two adjustable, hinged fixtures. Each of the support arms 30 is pivotally connected by its upper end to the underside of the front end of a respective receiving frame 21, while its lower end is provided with a pair of detent notches 31 and a slidable fixing means in the form of a latch plate 32. The dents 31 are arranged to receive a locating pin 14 provided on the forwardly extending leg 10 while the fixing latch 32 serves to lock the locating pin 14 in the notches 31, the latch being movable between two different, i.e. locking and release positions which the notches 31 are closed and opened respectively, whereby by this way, the support arms 30 are firmly but detachably connectable to the two forwardly extending legs 10 for retaining the tabletop 20 in a horizontal position. The latch plates are preferably spring-loaded and biased into their closed position.

When the fixing latches 32 is moved to the release position, the notches 31 are opened and

the support arms may detach from the locating pins 14, and, consequently, the legs 10, to allow the legs 10 as well as the table top 20 to be folded in a vertical direction due to their pivotal connection with the brackets 11.

Each of the top board mounting fixtures comprises an upper part 23 and a lower part 22, the upper part 23 is pivotally connected to the lower part 22 while the latter is disposed on the receiving frame 21. The upper part 23 is provided with a retaining pin 24 which transversely passes through an arcuate guiding slot 25 formed in the lower part and having enlarged holes at its ends. The retaining pin 24 has a spring 26 supported thereon for biasing the pin longitudinally, and the pin has larger diameter end portions which engageable in the enlarged holes at the ends of the guiding slots 25, for securing the upper part in either of two pivotal positions so that the top board 27 fixed on top of the upper part 23 may be positioned in either a level i.e. horizontal position or an upright position to facilitate the clamping of articles of different sizes and/or shapes by the lower part 22. The alternative positions for the top boards are shown in Fig. 3. When the worktable 100 is to be folded, the bottom ends of the support arms 30 are released from the locating pins 14, and the legs as described above.

Then the tabletop 20 is pivoted upwardly and the legs of each of legs 10 are folded toward each other, which can be performed while two pairs of legs 10 are in contact with the ground. The worktable is shown in its folded condition in Fig. 2, from which it can be seen the space occupied by the folded worktable 100 is minimal whereby handling and storage are facilitated.

Claims

1. A worktable comprising two pairs of legs (10), a table top (20) supported by the legs, the legs of each said pair being pivotally interconnected by a joint means at their upper ends, and said tabletop including a pair of receiving frames (21), pivotally connected to said joint means and having a pair of clamping members (27) disposed thereon, the distance between said members being adjustable by a threaded rod to enable articles to be firmly clamped therebetween, and a pair of support arms (30) having upper ends pivotally connected to forward end portions of the respective receiving frames, the lower ends of the support arms comprising locking means for releasable engagement with locating pins (14) provided on the forward most legs of the pairs of legs for said support arms to support said tabletop to maintain it in a level condition, said locking means including slidable fixing means (32)

movable between open and closed positions for releasing and locking the support arm, respectively, with respect to said locating pin, and disengagement of the support arms from said locating pins (14) permitting said legs to pivot toward each other and said tabletop to be pivoted upwardly and thereby the worktable to be folded is substantially flat. 5

2. A worktable as claimed in claim 1, wherein the lower ends of the support arms have notches (31) for receiving the locating pins, and the fixing means comprise longitudinally slidable latch elements arranged to retain the pins in the notches in lower closed positions thereof. 10 15

3. A worktable as claimed in claim 1 or 2, wherein a pair of clamping member support fixtures is carried on each receiving frame, each said fixture includes a lower part (22) connected to said receiving frame, an upper part (23) pivotally connected to said lower part for movement between two positions substantially at 90° to each other, whereby the clamping members are adjustable between respective positions in which said members are substantially level, and in which said members are substantially upright. 20 25

4. A worktable comprising a pair of elongate clamping members (27), support means carrying the clamping members and including means for moving said members towards and away from each other in a direction transverse to the length of said members, each clamping member being mounted on the support means by hinged mounting fixtures including upper and lower parts (22, 23) connected for relative pivotal movement between two positions substantially 90° apart, whereby the clamping members are independently and selectively adjustable about generally parallel longitudinal axes and between positions substantially level with the plane containing said axes and substantially perpendicular to said plane. 30 35 40 45

5. A worktable according to claim 3 or 4, wherein the upper and lower parts of each fixture are interconnected by a retaining pin (24) fastened to one part and engaged in a guide slot formed in the other part. 50

6. A worktable according to claim 3, 4 or 5, wherein releasable means (24, 25) is provided for retaining the upper part of each fixture in each of said two positions. 55

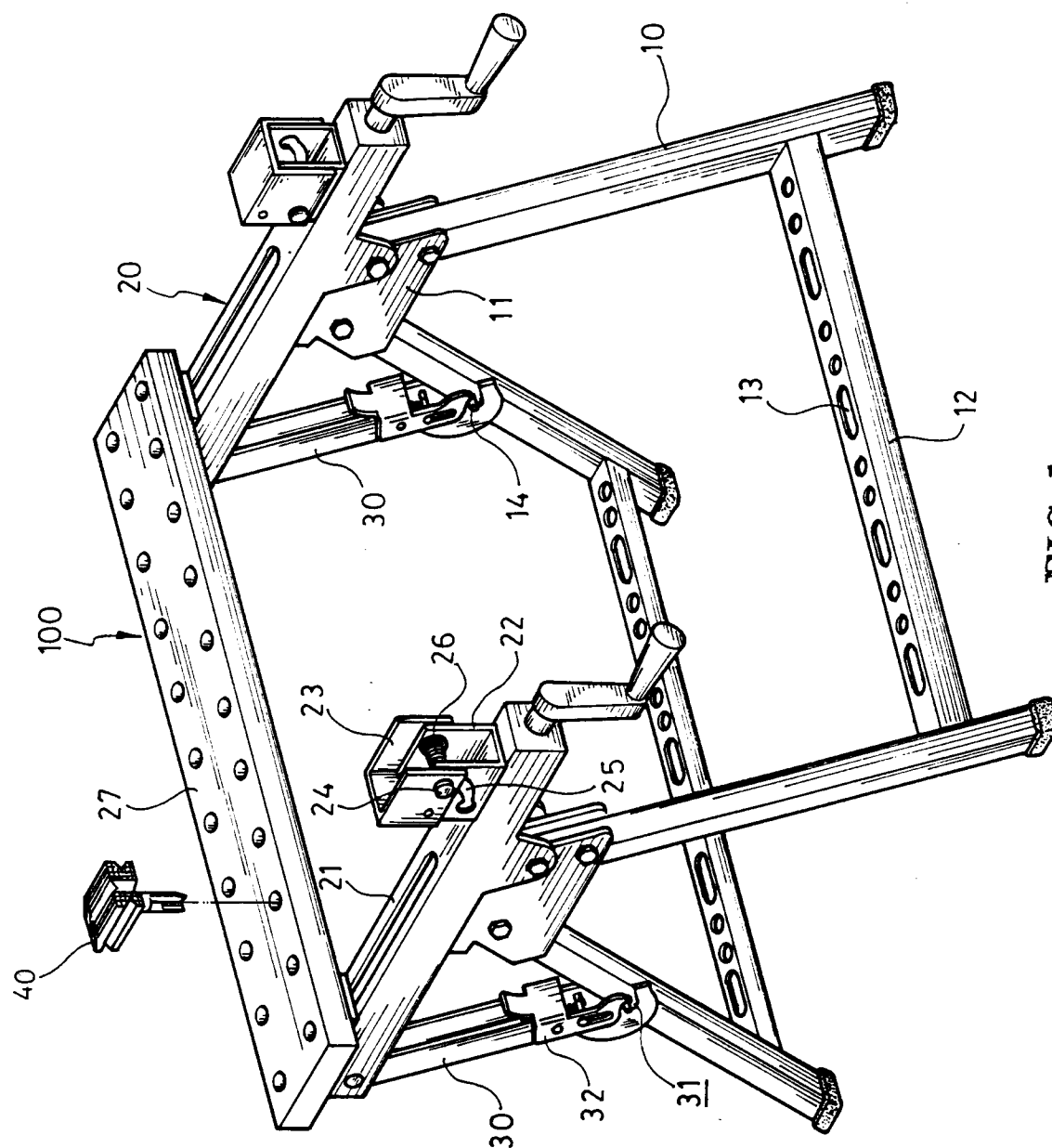


FIG 1

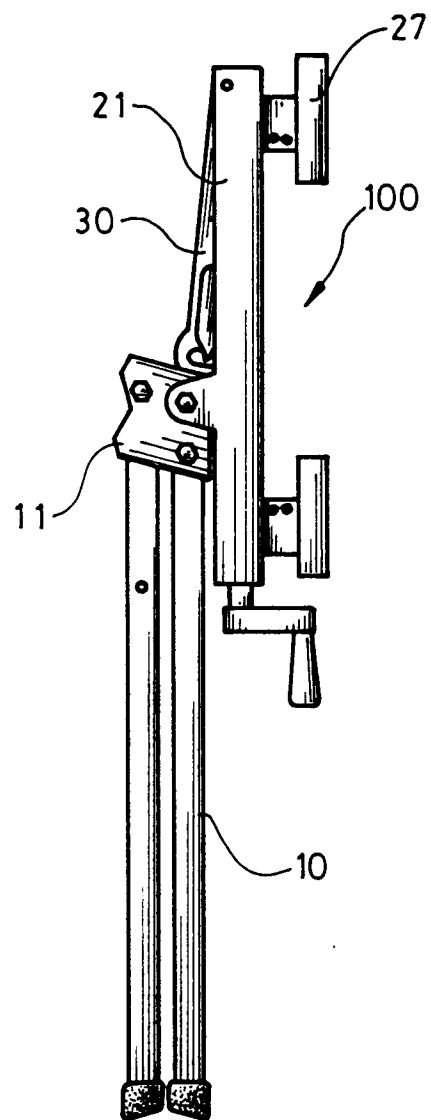


FIG 2

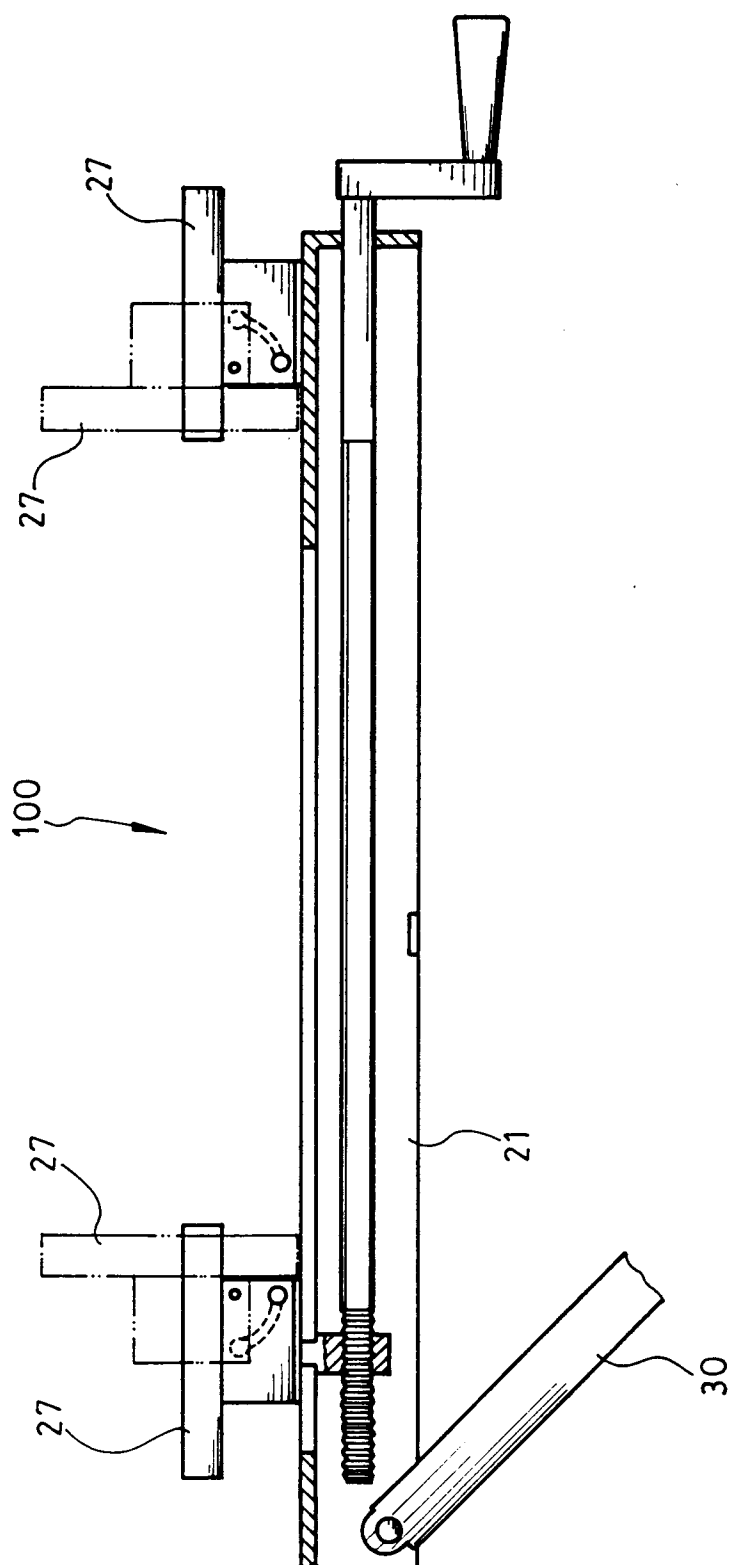
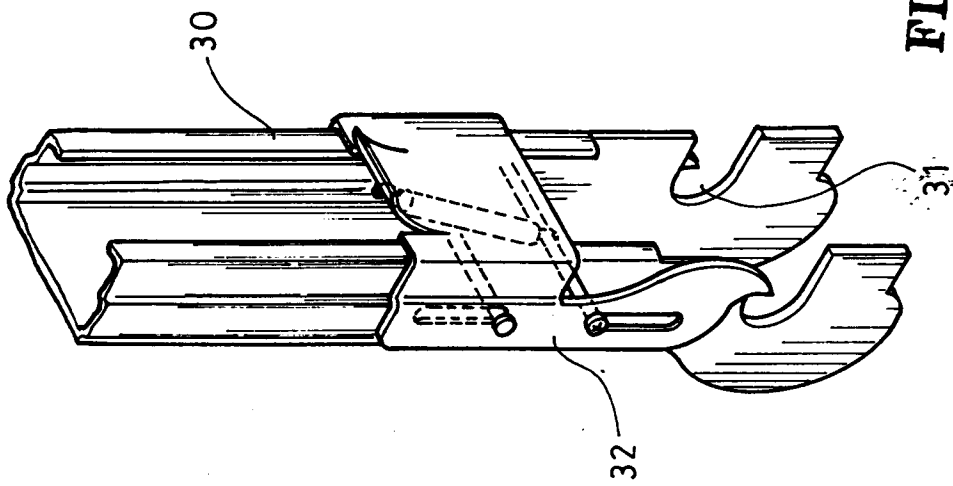


FIG 3



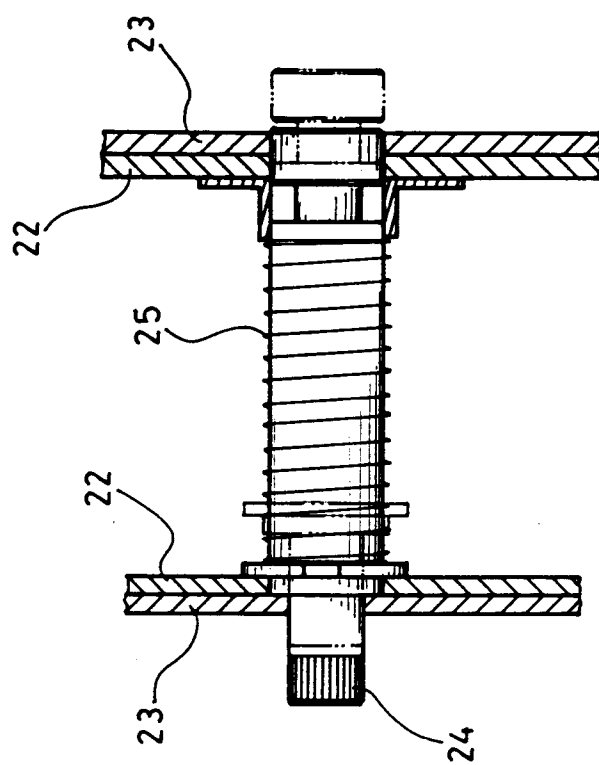


FIG 5



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EUROPEAN SEARCH REPORT

Application Number

EP 90 31 0094

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
Y	WO-A-9 008 627 (CANNON EQUIPMENT CO.) * Abstract * ---	1,2	B 25 H 1/04 B 25 H 1/10
Y	AT-C- 345 504 (AIGNER ERNST ING.) * Figure 1; claim 1 * ---	1,2	
A	GB-A-2 166 682 (JONES) * Abstract * ---	1,2	
A	US-A-4 154 435 (ALESSIO) * Figures 1b,2 * ---	1,3	
A	EP-A-0 098 101 (HILTON (PRODUCTS) LTD) * Figure 4 * ---	1	
A	AU-A- 532 153 (ALESSIO) * The whole document * ---	1	
A	US-A-1 776 346 (BUFFINGTON) * Figure 7 * ---	1	
A	US-A-4 369 822 (RICE) ---		TECHNICAL FIELDS SEARCHED (Int. Cl.5)
A	GB-A- 594 337 (CHARLESWORTH) ---		B 25 H A 47 B
A	US-A-1 421 929 (FLORESKUL) -----		
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 07-05-1991	Examiner CARMICHAEL D.G.
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			



CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing more than ten claims.

- ☐ All claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for all claims.
- ☐ Only part of the claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims and for those claims for which claims fees have been paid, namely claims:
- ☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims.

X LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirement of unity of invention and relates to several inventions or groups of inventions, namely:

See sheet -B-

- ☐ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.
- ☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:
- ☒ None of the further search fees has been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims.

namely claims: 1-3



LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirement of unity of invention and relates to several inventions or groups of inventions, namely:

1. Claims 1-3: Support mechanism for a collapsible worktable.
2. Claims 4-6: Adjustable clamping members on a worktable.