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(71) Applicant: **HILTON (PRODUCTS) LIMITED**
Halliwell Industrial Estate Wapping Street
Halliwell Bolton(GB)

(72) Inventor: **Hilton, Allan Richard**
Crossfields Ravenhurst Drive
Heaton Bolton(GB)

(74) Representative: **Massey, Alexander et al,**
MARKS & CLERK Scottish Life House Bridge Street
Manchester, M3 3DP(GB)

(54) **Vice and workbenches.**

(57) A workbench comprises a worktop supported by a collapsible leg arrangement, the worktop being adapted to support a vice comprising separate fixed and movable vice jaws.

The worktop is formed with elongate slots at predetermined locations each adapted to receive a depending hook-like formation of a fixed vice jaw.

The worktop also is formed at predetermined locations at its edge and extending inboard of the latter elongate recesses into each of which movable vice jaws can be located and secured by complementary formations at the inboard ends of the recesses and movable vice jaws.

The separate fixed and movable vice jaws are secured in an operational working relationship by the worktop and such relationship can be varied.

1.

VICE AND WORKBENCHES

This invention relates to a vice and a worktop particularly adapted for use with the vice.

The present invention is also concerned with a workbench incorporating the adapted worktop.

5 As is well known a vice generally comprises a fixed jaw and a movable or adjustable jaw between which can be gripped a workpiece, the fixed jaw being bolted or otherwise secured to a workbench with the movable jaw tied to the fixed jaw by
10 guides such as rods and/or slides but movable towards or away from the fixed jaw by an adjusting screw.

 With such conventional vice structure the vice is bodily immobilised in, or restricted
15 to, a predetermined position on the workbench and is also restricted in its gripping capacity by its dimensions, i.e. its gripping width (transverse length of the jaws) and gripping length (spacing between the jaws).

20 It is an object of the present invention to provide a vice which obviates or mitigates the aforesaid restrictions and which has a substantially greater gripping capacity than a conventional vice.

25 According to the present invention, there is provided a vice comprising separate fixed and

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movable jaws between which a workpiece can be gripped, the jaws being adapted to be disposed in cooperating working relationship by being removably and adjustably located in predetermined
5 positions on a worktop.

Also according to the present invention there is provided a worktop adapted to receive and locate separate fixed and movable vice jaws in spaced apertures in the worktop surface.

10 Preferably the worktop surface presents a multiplicity of apertures to permit separate and movable vice jaws to be located in different longitudinal and/or transversal working relationships.

15 The worktop is preferably supported, when in use, by a collapsible or foldable leg arrangement to provide a workbench.

The workbench may incorporate under the worktop and supported thereby and by the leg
20 arrangement a shelf and saw block assembly.

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An embodiment of the present invention will now be described, by way of example, with reference to the accompanying drawings, in which :-

5 Fig. 1 is a perspective view of a workbench
 and vice combination according to the
 present invention;

Fig. 2 is a similar view of workbench and vice
combination more suitable for do-it-
yourself (DIY) purposes;

10 Fig. 3 is a detailed view of the aforesaid
 workbenches;

Fig. 4 is a diagrammatic side view of a work-
bench according to the invention in
erect, partially collapsed or folded
15 and collapsed or folded positions;

Fig. 5 is a perspective exploded view of the
worktop and vice components of the
workbench/vice combination of Fig. 1;

20 Fig. 6 is a sectional view on the line VI-VI
 of Fig. 5;

Fig. 7 is a sectional view on the line VII-VII
of Fig. 5;

Fig. 8 is a sectional view to an enlarged scale
of a detail of Fig. 6;

25 Fig. 9 is a perspective view of the movable
 jaw of the vice according to the
 invention;

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Figs 10 and 11 are front and side elevations of a single fixed jaw of the vice according to the invention; and

5 Figs. 12 and 13 are front and rear perspective views of a double fixed jaw of the vice according to the invention.

The workbench will be described mainly with reference to Fig. 1 and like parts in Fig. 2 will be indicated by the same reference numerals with the
10 suffix "A".

The workbench comprises a worktop 20 supported by a collapsible or foldable undercarriage or leg arrangement 21 which also supports a shelf/saw block assembly 22. The worktop 20 is designed to receive
15 and locate a vice according to the invention.

The worktop 20 and shelf/saw block assembly 22 are formed of a rigid plastics material, for example of moulded polypropylene, while the undercarriage 21 is of metal construction.

20 The vice according to the present invention is distinguished by the fact that it consists of two completely separate units, namely a fixed jaw 23 and a movable or adjustable jaw 24, which are brought together in a cooperative working relationship by
25 being removably and adjustably received in a selected two of a multiplicity of locations defined by the configuration of the worktop 20.

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Reference will now be made to the vice with particular reference to Figs. 9 to 13.

The fixed jaw 23 (Figs. 10 and 11) is a single jaw, that is it has a workpiece gripping face of a length equal to or substantially so to the gripping face length of a movable jaw 24. The fixed jaw 23 is formed of aluminium although it may be moulded from a plastics material. It is of unitary construction and comprises a workpiece-gripping body 25 with a grooved configuration 26 along and adjacent its top edge, rearwardly-extending strengthening ribs 27 and a central depending hook-like formation 28 which serves to locate the fixed jaw 23 in the worktop 20 as will be later described.

Figs. 12 and 13 illustrate a double fixed jaw 23A and parts similar to those of Figs. 10 and 11 have the same references with the suffix "A". The difference between fixed jaws 23 and 23A is that the latter has a gripping face length equal at least twice that of the gripping face length of the movable jaw 24.

The movable jaw 24 (see in particular Fig. 9) comprises an elongate body 29 of aluminum by means of which it is located in the worktop 20 as will be described later. The body 29 is of channel configuration, open at its top and closed at both ends. The leading end of the body 29, i.e. the end which is

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inboard of the worktop edge when the movable jaw
24 is mounted on the latter, is closed by a wall
30 which is inclined downwardly and rearwardly and
which has two lateral extensions 31. The rear end
5 of the body 29 is closed by a vertical wall 32.

A steel screw 33 is rotatably disposed within
the channel of the body 29, the screw ends being
supported by the wall 30 and 32 and extending through
the wall 32 to receive and mount an operating
10 handle 34.

The movable jaw 24 also has a workpiece-gripping
body 35 integral with a bottom support member 36
which lies within the channel of the elongate body
29 and which has a screw-threaded bore through which
15 the screw 33 extends. The gripping body 35 has a
grooved configuration 37 along and adjacent its
upper edge and also rear strengthening ribs 38.

The elongate body 29 has intermediate its
ends a depending formation 39 (see Fig. 6) which
20 may be provided by pressing out the metal of the
body 29. The purpose of this projection will be
described later.

It will be manifest that rotation of the screw
33 causes the gripping body 35 to move towards or
25 away from the leading end of the elongate body 29
depending on the direction of rotation.

The movable jaw 24 may be wholly or partly

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formed of plastics material.

Reference will now be made to the worktop 20
(see in particular Figs. 5 to 8).

The worktop 20 is moulded from plastics material,
5 for example of polypropylene, with a peripheral lip
40 depending from its upper surface 41 and has an
underside of ribbed configuration as is generally
indicated at 42 (see Fig. 6).

The worktop 20 is moulded with a multiplicity
10 of through-apertures 42 in the form of slots laid
out in a predetermined arrangement and each of which
is adapted to receive a hook-like formation 28 of
a fixed jaw 23 to locate the latter on the worktop
20. The spacing between certain of these slots 42
15 is such as to accommodate the laterally-spaced hook-
like formations 28A of a double fixed jaw 23A (see
for example slots 42A).

The ribbed configuration of the worktop 20
and the complementary shape of the hook-like forma-
20 tion 28 (or 28A) is such (see Fig. 8) that pressure
of a workpiece (not shown) against the gripping body
25 resulting from the action of a movable jaw 24 on
the workpiece tends to push the fixed jaw 23 in the
direction of the arrow P and so urge the formation
25 28 against and under the rear rib configuration 43
defining one wall of the slot 42 in question.

It will be manifest that insertion and removal

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or re-positioning of a fixed jaw 23 (single or double) can be easily and quickly effected.

The worktop 20 is also formed with a number of elongate recesses 44 extending inwardly from the peripheral edge of the worktop 20 and as with the slots 42 laid out in a predetermined arrangement. Each of these recesses 44 is configured to accommodate an elongate body 29 of a movable jaw 24. Each recess 44 intermediate its ends is apertured as indicated at 45 to receive the depending projection 39 of the elongate body 29 of a movable jaw 24. Each recess 44 at its leading (i.e. inboard) end terminates in an elongate transverse slot 46 having a rear downwardly inclined wall 47 against which the front wall 30 and lateral extensions 31 of the elongate body 29 of a movable jaw 24 abut. The movable jaw 24 is slid into a recess 44 at an angle (see arrow A, Fig. 6) and pushed rearwardly (i.e. outboard) until the projection 39 engages in the aperture 45. This engagement resists longitudinal movement of the elongate body 29 relative to the worktop 20 when a movable jaw 24 is being operated.

A through-aperture 48 of rectangular configuration and of relatively substantial dimensions is formed adjacent one end of the worktop 20 and serves to receive and mount and serve as a working area for

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a tool such for example as an electrical drill or a power saw.

Recesses 44 and associated slots 46 are infilled, when not in use, by blanking-off pieces 5 49 which are dimensionally identical to the elongate bodies 29 although they are solid and not of channelled configuration.

Similarly, rectangular aperture 48 which may be disposed in either of the two ways shown in 10 Fig. 1 is filled-in, when not in use, by a blanking-off member 50 (shown inverted in Fig. 1).

Along and adjacent the edge of the worktop 20 remote from the aperture 48 is a recess 51 which mounts a rule 52, preferably a steel rule.

15 Instead of a fixed vice jaw 23 a movable jaw 24 may be employed with a simple stop having a hook-like formation similar to 28 for engaging in a slot 44.

It will be manifest from the above that the 20 separate and independent fixed and movable vice jaws 23 (23A) and 24 are operatively tied together in working relationship through the worktop 20.

It will also be manifest that as a result of the worktop 20 of the present invention the transverse 25 and/or longitudinal spacing between fixed and movable vice jaws 23 (23A) and 24 can be widely varied. For example, considering Fig. 5, there could be a

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movable jaw at position MJ1 and a single fixed jaw at position FJ1 or FJ2 or FJ3; or two movable jaws at positions MJ1 and MJ2 and a double fixed jaw at positions FJ1, FJ1A or FJ3, FJ3A; or a movable jaw
5 at each of positions MJ1, MJ4 and fixed jaws at FJ1, FJ4, and so on.

With the fixed and movable vice jaws 23(23A) and 24 removed and the blanking-off pieces 49 and blanking-off member 50 fitted onto the worktop 20
10 the latter is perfectly flat and imperforate save for the slots 42. A flat imperforate cover (not shown) may be fitted on top of the worktop 20 when in this condition to provide a conventional table surface. Moreover it is envisaged that a table
15 extension may be provided which can be secured at one end, in any convenient manner, to one end of the worktop, when the latter is converted to a conventional table, which extension is supported at its other end on a pivotal metal leg frame and
20 which has a reversible table top, one side smooth and the other indented or recessed to hold bottles and other containers.

Reverting now to the workbench and in particular Figs. 1 to 4, the worktop 20 is supported, as
25 aforesaid, by the collapsible leg arrangement 21.

The leg arrangement 21 comprises a pair of rear metal legs 53, splayed outwardly at the bottom

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as indicated at 54, joined by a metal step or foot rest 55, and pivoted to the underside of the worktop 20 at locations 56 (see Fig. 6).

5 The leg arrangement also comprises a pair of front metal legs 57 also splayed outwardly at the bottom as indicated at 58, joined by a metal strip or bar 59 and pivoted to the underside of the worktop at 60 (see Fig. 6).

10 The legs 43, 57 at each side of the worktop 20 are pivotally connected by a strut 61, which struts ensure simultaneous pivoting movements of the pairs of legs 53, 57.

15 The pivotal connection 62 between each strut 61 and its corresponding leg 53 is also the pivotal connection between the leg 53 and one end of a collapsible or foldable crank stay 63, the other end of the latter being pivoted to the underside of the worktop 20 at 64. A knob or handle 65 is provided on each crank stay 63 to facilitate
20 manipulation thereof and a stop 66 resists excessive pivotal movement of the crank stays 62 in the direction of workbench erection.

A shelf 67 of moulded plastics material, for example polypropylene, lies under the worktop 20
25 parallel thereto. At its front end it is suspended from the worktop 20 by rods or spring wires 68 pivoted to the worktop 20 at locations 60 and sprung

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into holes or recesses in the shelf. At its rear end, it is pivotally secured to the legs 53 by pivotal connections 62 (see detail view of Fig. 1).

5 A saw block 69 with lateral extensions 70 is integral with the shelf 67 and lies, in erected position of the workbench, rearwardly of the legs 53.

It can readily be seen (Fig. 4) that in folding or collapsing of the workbench upon breaking
10 of the crank stays 62, the legs 57 and 53 pivot forwardly and upwardly about connections 60 and 56 towards the underside of the worktop 20 carrying the shelf/saw block assembly 22 upwards to lie against the underside of the worktop 20.

15 The workbench is consequently of very compact, relatively flat and easily carried configuration when collapsed or folded.

It is envisaged that wheel extensions may be pivoted to the bottom of the legs 53 and 57 so that,
20 when these are brought into use, the erected workbench can be wheeled to different locations.

It is envisaged that with each workbench there is provided at least one single fixed vice jaw, one double fixed vice jaw and two movable vice jaws.

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CLAIMS:

1. . A vice comprising separate fixed and movable jaws between which a workpiece can be gripped, the jaws being adapted to be disposed in cooperating working relationship by being
5 removably and adjustably located in predetermined positions on a worktop.

2. A vice as claimed in claim 1, in which each jaw is adapted to be detachably engaged with, or secured to, the worktop.

10 3. A vice as claimed in claim 1 or 2, in which the fixed jaw has a depending hook-like formation adapted to engage in an elongate slot in the worktop surface.

4. A vice as claimed in claim 3, in which
15 the fixed jaw has a workpiece-gripping length sufficient to accommodate two separate side-by-side movable jaws and two spaced depending hook-like formations adapted to engage in spaced elongate slots in the worktop surface.

20 5. A vice as claimed in any one of claims 1 to 4, in which the movable jaw comprises an elongate body adapted to be engaged in an elongate recess in the worktop, a gripping jaw proper, and a mechanical screw arrangement supported in the
25 elongate body and rotatably associated with the jaw proper to move the latter longitudinally

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relative to the elongate body.

6. A vice as claimed in claim 5, in which the elongate body has a depending formation with lateral extensions adapted to engage in an aperture in the worktop.

7. A vice as claimed in claim 6, in which the depending formation is at the leading end of the elongate body and is rearwardly inclined for engagement in a complementarily shaped slot in the worktop at the leading end of the elongate recess, the lateral extensions abutting against a wall defining the slot.

8. A worktop adapted to receive and locate separate fixed and movable vice jaws in spaced apertures in the worktop surface.

9. A worktop as claimed in claim 8 comprising, in its surface, a multiplicity of apertures to permit separate fixed and movable vice jaws to be located in different longitudinal and/or transversal cooperating working relationships.

10. A worktop as claimed in claim 8 or 9 in which the or each aperture adapted to receive and locate a fixed vice jaw is in the form of an elongate slot defined by a wall against and under which a depending hook-like formation engages.

11. A worktop as claimed in any one of claims 8 to 10 in which the or each aperture

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adapted to receive and locate a movable vice jaw comprises an elongate recess extending inboard from an edge of the worktop and merging at its inboard end with a transverse elongate slot defined
5 by a wall downwardly inclined towards the worktop edge and presenting lateral faces against which a downwardly-inclined laterally-extended formation of the movable vice jaw can abut.

12. A worktop as claimed in claim 11
10 comprising, for the or each movable jaw aperture, a blanking-off piece which, when in place in the recess and transverse slot, provides a flat surface aligned with the general worktop surface.

13. A worktop as claimed in any one of
15 claims 8 to 12 comprising a recess extending along and adjacent to one edge to accommodate a rule.

14. A worktop as claimed in any one of claims 8 to 13 having operatively associated
20 with it a vice as claimed in any one of claims 1 to 7.

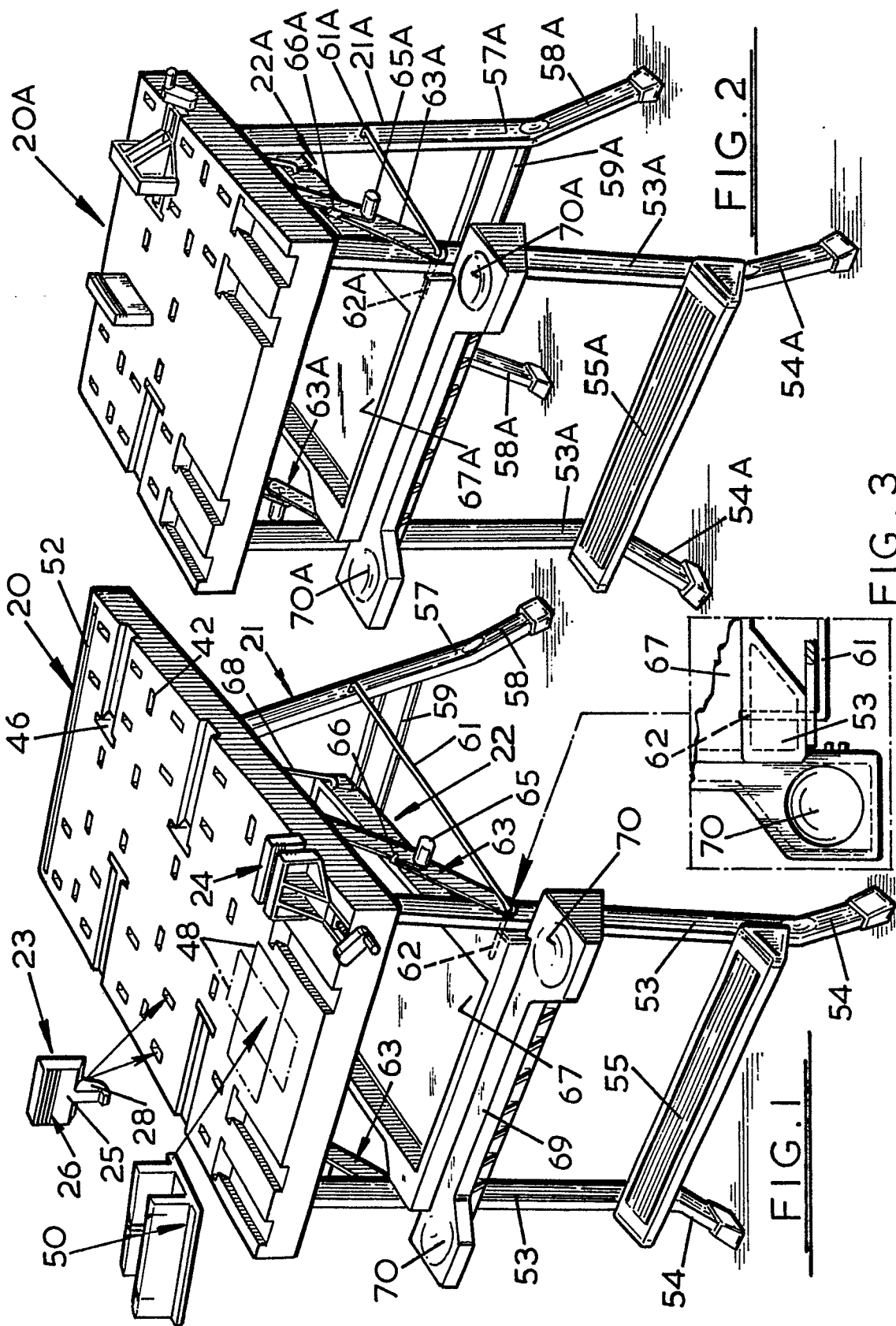
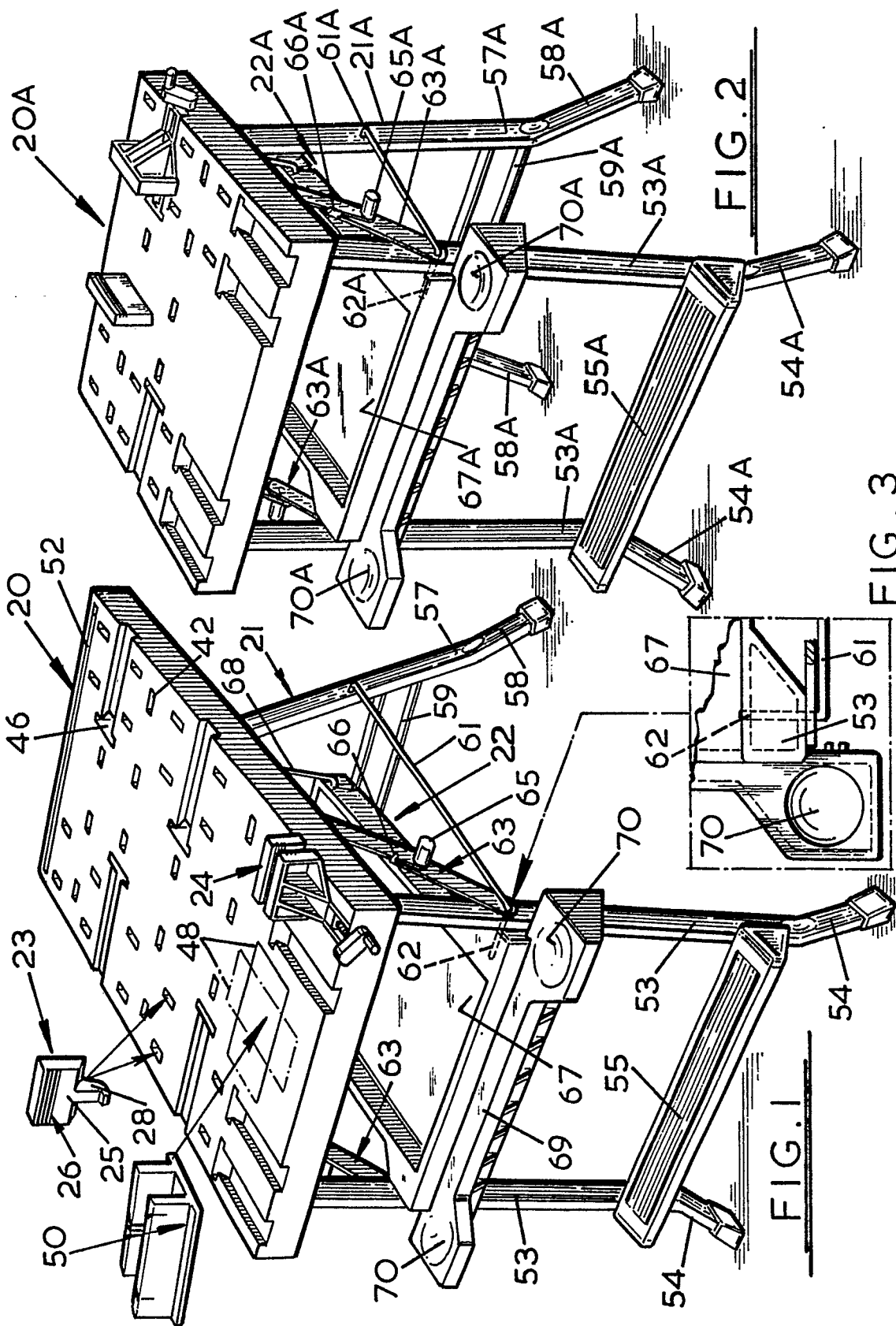
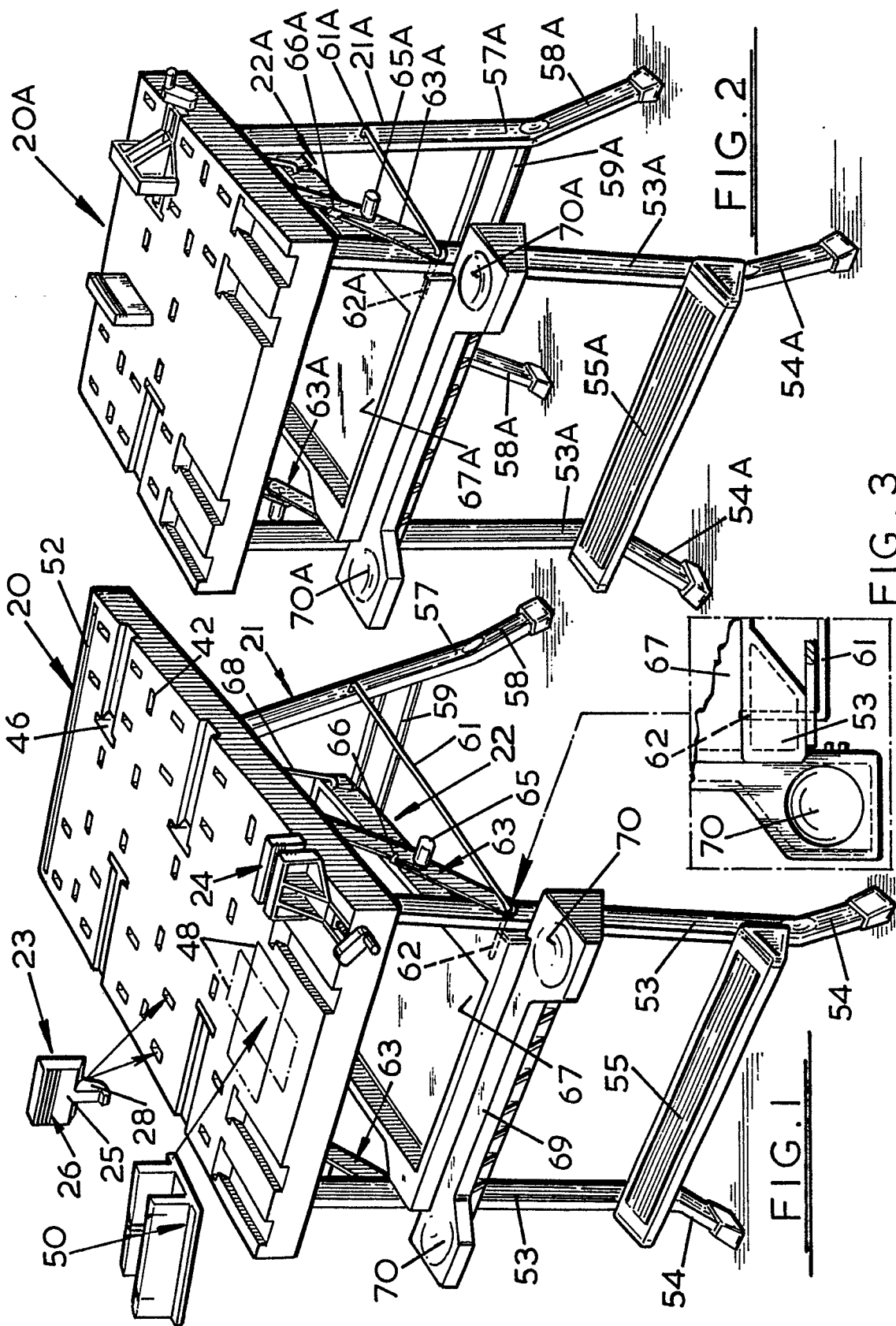
15. A worktop as claimed in claim 14 in which the whole width or length of the worktop can be utilised for gripping a workpiece by
25 locating a fixed and movable vice jaw combination adjacent each of two opposed edges of the worktop.

16. A worktop as claimed in any one of

16.

claims 8 to 15 supported by a collapsible
leg arrangement to provide a workbench.

17. A workbench as claimed in claim 16
comprising, pivotally suspended beneath the worktop
5 and pivotally connected to the leg arrangement,
a shelf and an integral saw block at one end.



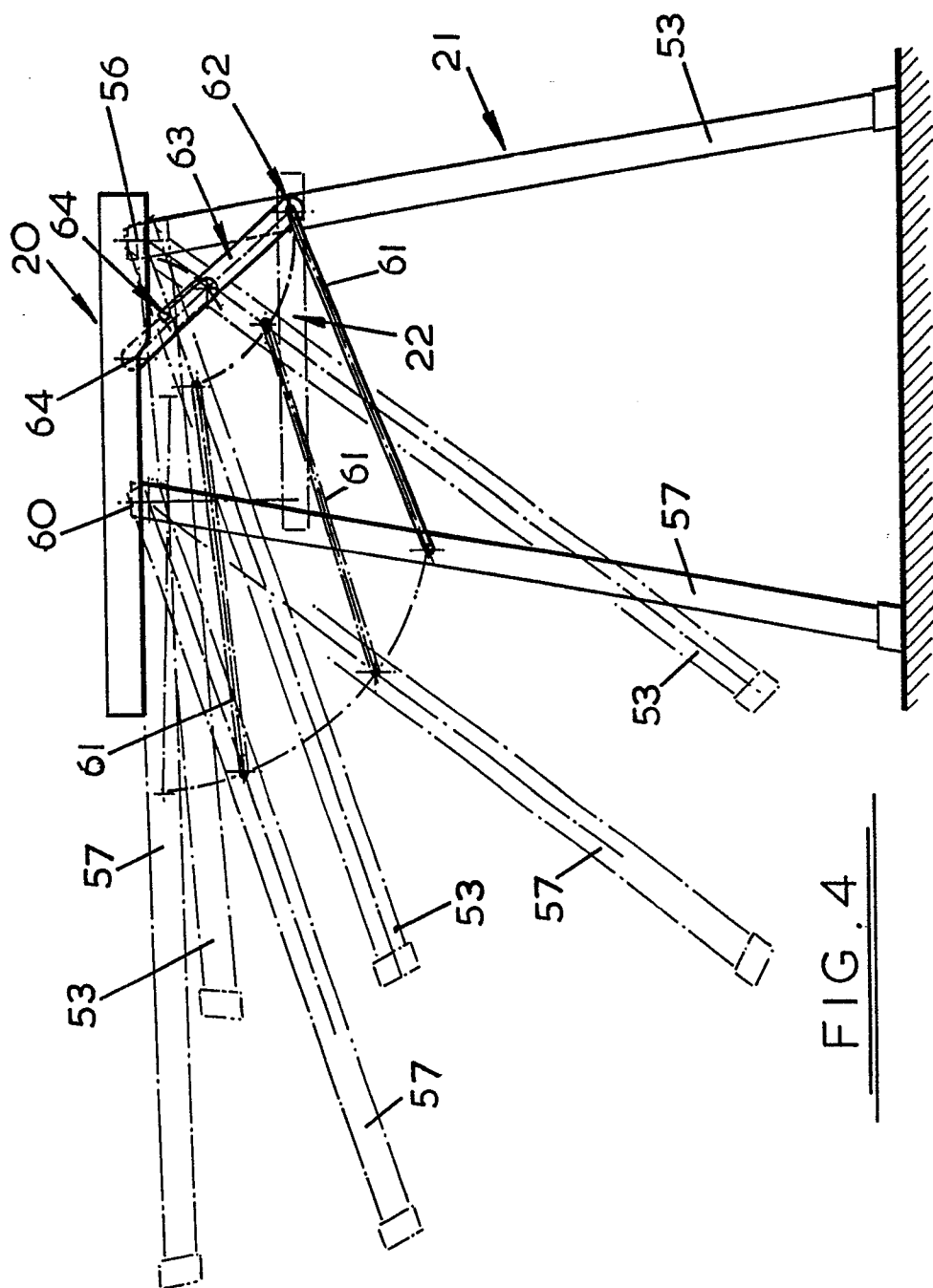


FIG. 4

