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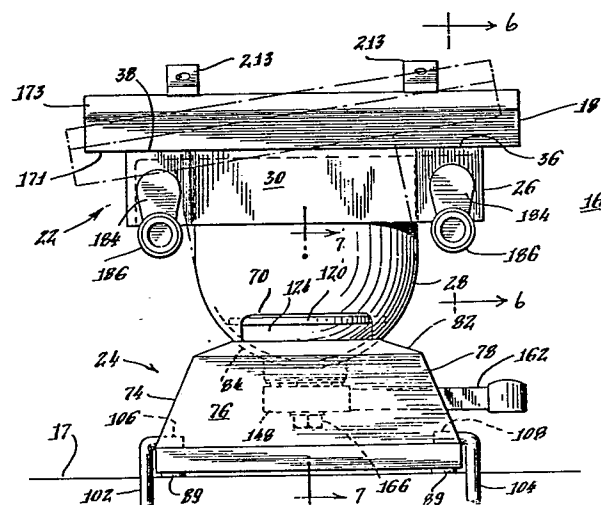
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㉙ Improved means for supporting a workpiece during moderate working operations.

㉚ Vise for supporting a workpiece during moderate to light working operations comprises first and second jaw members (18) and a support means (22) formed of a polymer plastic. The support means (22) comprises a support body (22) for the jaw members (18) and a base body (24). The support body (22) includes a bowl shaped segment (28) which is received in a cavity (84) of the base body (24). A restraining means (120) enables repositioning of the support body (22) at a plurality of different orientations and for restraining the body (22) at a selected orientations.



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IMPROVED MEANS FOR SUPPORTING A WORKPIECE DURING
MODERATE WORKING OPERATIONS

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This invention relates generally to apparatus for supporting a workpiece. The invention relates more particularly to an improved vise for supporting a workpiece which is subjected to relatively moderate to light working operations.

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Bench top vises are known for gripping and supporting a workpiece during a working operation on the workpiece.

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These vises generally include a vise body having a pair of gripping jaw members which are forced into engagement with, and sandwich, a workpiece therebetween.

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Relative motion between the jaw members for gripping or releasing a workpiece is provided by the rotary motion of a lever actuated screw which engages internally threaded segments of the jaw members. A means is provided for mounting the vise body to a table surface or bench top for rigidly securing the vise during a working operation. Typical mounting means comprise bolts, lag screws and clamps.

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At times a working operation is facilitated by rotating the vise body and the gripped workpiece in order to

1 present the workpiece at a more convenient attitude.
To this end, a means has been provided for rotating
the vise about various axes. In addition, a vise is
also often required to grip an elongated workpiece
5 such as a pipe. Both the construction of the vise and
its mounting to a workbench can interfere with such use.
These limitations have been circumvented by off center
gripping of the workpiece and mounting of the vise. The
jaw actuating screw is generally positioned at a cen-
10 trally located position beneath the jaws thus necessita-
ting positioning of an elongated workpiece at an off
center location between the jaws so as to by-pass the
transversely extending screw. The vise body must also
be mounted to provide bench overhang for enabling a non-
15 interferring extension of an elongated workpiece.

The working operations to which a vise supported work-
piece are subjected include, for example, forming and
shaping by pounding, hammering, filing, grinding, shea-
20 ring, heating, welding, soldering, etc. In order to
sustain the various working operations, some of which
impose relatively large and severe impact forces on the
vise, the bench top vise is ruggedly constructed, it is
formed of solid metal, it has considerable weight and is
25 relatively costly. Although the aforementioned vise
provides satisfactory gripping of workpieces at a work-
bench, their size, weight and configuration do not lend
to ready portability of the vise and such a vise is con-
sidered to be stationary and not convenient to movement
30 from work place to work place.

In providing a vise suitable for relatively moderate to
light working operations and hobby activities and which
can be used free standing or can be readily mounted and
35 demounted, the aforementioned vise arrangement has been

1 scaled down in size. While portability is imparted to
the latter type of vise, nonetheless this form of vise
is fabricated of metal, is still relatively heavy and
costly, has a substantially limited jaw opening and
5 does not provide a desired angularity control between
the vise jaws, a feature which is often desirable in
various working applications.

1 Accordingly, it is an objekt of this invention to pro-
10 vide an improved vise.

Another object of the invention is to provide an im-
proved vise for supporting a workpiece during relatively
moderate to light working operations.

15 Another object of the invention is to provide an im-
proved vise for stationary or portable use, which is
of relatively light weight and which can be economically
fabricated.

20 Another object of the invention is to provide a portable
vise for supporting a workpiece during relatively mode-
rate to light working operations and which has an en-
hanced gripping jaw spacing for supporting relatively
25 large workpieces.

Still another object of the invention is to provide a
portable vise for supporting an elongated workpiece
during relatively moderate to light working operations
30 and having an improved arrangement for providing clearance
of a vertically supported elongated workpiece.

Another objekt of the invention is to provide an im-
proved portable vise having means for varying an angle
35 between gripping jaw members of the vise.

1 Another object of the invention is to provide a portable
vise which can be used free standing and which is readi-
ly mounted to and demounted from a worktable.

5 A further object of the invention is to provide an im-
proved vise for hobby use.

In accordance with features of the vise of this inven-
tion a support means for first and second workpiece-
10 gripping jaw members is provided including a support
body having a frame member and an integrally formed
bowl shaped member. The frame member which extends in
a principal plane includes an aperture and provides a
support surface for the jaw members for movement there-
15 of in a direction parallel to the principal plane and
adjacent the aperture. The bowl shaped member extends
transversely to the principal plane and communicates
with the aperture. The support means further includes
a base body having a cavity formed therein. The cavity
20 is adapted for receiving and seating a bottom segment
of the bowl member, and, a curved surface of the cavity
engages a curved surface of the bowl member for sliding
engagement therebetween. A restraining means is provided
which captivates the support body in the cavity and
25 alternatively enables sliding movement of the bowl
member or maintains the bowl member at a preselected
orientation. A means is provided for mounting the jaw
members to the frame member for varying the relative
spacing therebetween for gripping a workpiece. The
30 support means is formed of a relatively light and re-
latively economic material and preferably a polymer
plastic. The vise arrangement is advantageous in that
it is fabricated of a relatively lightweight, relatively
low cost material yet is adapted to sustain relatively
35 moderate to light working forces which are impressed on

1 a gripped workpiece and which are distributed form the
workpiece through the frame member, the bowl member, and
the base body to a support surface for the vise.

5 In accordance with another feature of the invention,
the support body provides for a limited extension of an
elongated workpiece through the frame aperture and into
the anterior of the bowl. The gripped workpiece can
thereby be centrally orientated on the vise.

10

In accordance with other features of the invention, the
frame member provides a means for supporting the jaw
members adjacent a surface thereof, and enables the jaw
members to be relatively widely spaced along a length
15 of the frame member for supporting a relatively large
workpiece. A means for varying the relative spacing
between the jaw members is adapted to provide for
positioning of faces of the jaw members in an anti-
parallel attitude thereby enabling gripping of a wedge
20 shaped or a tapered workpiece.

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These and other objects and features of the invention
will become apparent with reference to the following
specification and to the drawings wherein:

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Figure 1 is a front elevation view of a vise constructed
in accordance with the features of this invention;

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Figure 2 is a plan view of the vise of Figure 1;

Figure 3 is a fragmentary bottom view of a support body
of Figure 1;

35

Figure 4 is a side elevation view of the support body
of Figure 3;

Figure 5 is a side elevation view of the vise of Figure

1 1 illustrating a frame member of the vise at alternate orientations;

Figure 6 is a fragmentary view taken along lines 6-6
5 of Figure 1;

Figure 7 is a fragmentary view taken along lines 7-7
of Figure 1;

10 Figure 8 is a fragmentary view taken along lines 8-8
of Figure 7;

Figure 9 is a fragmentary view taken along lines 9-9
of Figure 8;

15 Figure 10 is an enlarged perspective view of a locking
lever utilized with the vise of Figure 1;

Figure 11 is a view of the vise of Figure 1 in a pre-
20 selected orientation and partly broken away to illustrate
a restraining means;

Figure 12 is a bottom view of an alternative embodiment
of a locking means of the invention;

25 Figure 13 is a view along 13-13 of Figure 12 illustra-
ting non-interference engagement between surfaces;

Figure 14 is a side elevation view of the locking means
30 of Figure 12 illustrating an interference between sur-
faces;

Figure 15 is an enlarged perspective view of a means
for mounting the vise of Figure 1 to a support surface;
35 and,

1 Figure 16 is an enlarged fragmentary view in section of
a swivel mounting arrangement; and,

5

Referring now to the drawings and particularly to
Figures 1-4, a vise 16 of the invention is shown suppor-
ted on a surface 17 of a workbench or a support table.
10 The vise 16 includes first and second workpiece gripping
jaw members 18 and 20 and a means for supporting these
members. The vise support means comprises a support body
22 and a base body 24. Support body 22 comprises an
15 integrally formed frame member 26 and an integrally
formed bowl shaped member 28. The jaw members 18 and
20, the support body 22 and the base body 24 are fabri-
cated of a relatively lightweight economical material.
One such material is a polymer plastic. A preferable
polymer plastic material is a structural foam.

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The frame member 26 includes a surface segment 29, a
peripheral skirt segment 30 and has a length 31 and a
width 32. The surface segment 29 includes parallel
aligned segments 36 and 38 each having elongated slots
25 40 and 42 formed therein. An aperture 52 (Fig.2) is
provided in the surface and extends in the direction
of a plane defined by the mutually perpendicular axes
56 and 57 (Fig.2). The first jaw member 18 is statio-
nary and is mounted to the surface 36 and 38 as indi-
30 cated in more detail hereinafter. The second jaw member
20 extends between the surfaces 36 and 38, and, as
indicated hereinafter, is advanced toward and retracted
from the stationary member 18 for respectively gripping
35 and releasing a workpiece 60 as shown in Fig. 5 or an
workpiece 61 as shown in Fig. 6.

- 1 The bowl member 28 communicates with the aperture 52
of the frame member. The bowl member 28 which has a
longitudinal axis 62 extends from the aperture 52 of
5 the frame member in the direction of its longitudinal
axis. The bowl member 28 includes a curved spherical
segment 64 (Fig. 4) shown to be a thin walled hollow
hemisphere and having a curved surface segment 66 lo-
cated at a bottom section 67 of the member. The bowl
10 member 28 has a depth extending in the direction of
its longitudinal axis 62 which enables extension of an
elongated workpiece into an interior of the member.
The bowl member can comprise a hollow hemispherical
body or it includes an extension segment such as the
15 integral cylindrical segment 69 (Fig. 4) which is posi-
tioned between the spherical segment 64 and the aper-
ture 52. A cut-out 70 is formed in the spherical segment
through which a component of a restraining means ex-
tends, as is indicated in greater detail hereinafter.
- 20 The base body 24 includes a plurality of upstanding
wall segments 74, 76, 78 (Fig. 1) and 80 (Fig. 7) which
provide an elevated platform surface 82 in which a de-
pending cavity 84 is formed. The cavity 84 includes a
curved surface 86 which conforms with the curvature
25 of the surface 66 of the bowl segment 64. Cavity 84 is
thus adapted to receive and seat the bowl member 28 for
sliding engagement between the bowl and base body sur-
faces. A plurality of feet 89 are mounted to the bottom
surface for spacing the base body from the table sur-
30 face 17. These feet made of a polymer for example pro-
vide against movement and slippage of the vise and
avoid scratching of a finished surface 17.
- 35 A restraining means is provided for captivating the
bowl member 28 in the cavity 84 and for alternatively

1 enabling sliding movement between the surfaces 66 and
86 or maintaining the bowl member 28 at a preselected
orientation. The restraining means includes a lock body
120 (Fig. 7) shaped as a spherical segment which is
5 positioned in the bowl member 28. A spherically curved
surface 124 conforms in surface configuration with a
spherically curved surface 125 of the interior of the
bowl 28. Body 120 includes a hub segment 122 and a key
shaped boss 123 extending axially from the hub segment
10 122 through the cutout 70 and into the base body 24.
A hexagonal shaped aperture 130 is formed in the hub
segment 22 and a cylindrical shaped bore 131 of reduced
diameter is formed in the hub and in the boss 123. A
rod 132, having a hexagonal head engages the hexagonal
15 aperture 130 and rotation thereof is inhibited. The
rod 132 extends through the aperture 130 and the bore
131. The restraining means further includes a cylindri-
cally shaped base body hub 133 integrally formed on the
base body and through which a key shaped aperture 134
20 extends. The key shaped boss 123 of body 120 engages
aperture 134 and inhibits rotary movement of the body
120. An annular array of raised ramp shaped segments
140, 142, 144 and 146 are integrally formed on a sur-
face 136 of hub 133.

25 A locking lever 148 is provided having a surface 150,
an aperture 152 formed therein, and an annular array
of ramp shaped segments 154, 156, 158 and 160 which are
integrally formed with the lever 148 and extend from
30 the surface 150. The ramp segments are arrayed for
providing that each ramp segment increases in height
in a predetermined direction as, for example, in a
counter-clockwise direction as shown in Figure 10. The
lever 148 is maintained in engagement with the surface
35 136 of the base body hub 133 by the screw 132 which

1 extends through the aperture 152 in the lever arm 148,
a washer 164 and a locking nut 166. The lock lever 148
includes a lever arm segment 162 which extends through
5 the aperture 90 formed in the base body wall. As shown
in Figure 5, this aperture includes a ratchet shaped
segment 167 extending to a notch 168. Upon rotation of
the lever arm 162 in a first direction 165 (Fig. 2),
the ramp segments 140, 142, 144 and 146 are forced into
engagement with the corresponding ramp segments 154, 156
10 158 and 160, thereby forcing the screw 132 to advance
in an axial direction toward the base body 24. The
effect of movement is determined by the relative position-
ing of ramp segments 140-146 and 154-160. As shown, the
lever arm is advanced about 30° to 60° to establish
15 interference. The captivating spherical body 120 then
exerts a force on the spherical segment 64 which is po-
sitioned between this body and the cavity surface 86.
Movement of the bowl member 28 and support body is in-
hibited and it is maintained at a preselected orienta-
20 tion. By rotating the lever arm segment 162 in a second
opposite direction 163 (Fig. 2), the ramp segments are
disengaged, the sandwiching force established by the
spherical body 120 on the bowl member 28 is released
and the bowl member, although captivated in the cavity,
25 can be reorientated by the application of hand pressure.
Upon reorientation, the bowl member 28 can then be
locked in the selected position by advancing the lever
arm in the opposite direction. A tool 169 (Fig. 11),
such as a wrench, may be extended through the aperture
30 90 for adjusting nut 166 to compensate for wear.
Figures 12, 13 and 14 illustrate an alternative cammed
surface configuration wherein surfaces 136 and 150 are
cammed or annularly tapered to provide interference
therebetween. Figure 11 illustrates non-interfering
35 engagement while Figure 12 illustrates the lever 148

1 rotated for establishing interference.

The bowl member 28 is advantageously adjustable in the cavity and has substantial freedom of movement in order to present the workpiece at a desired attitude. The extent of reorientation and movement of the bowl member 28 in the cavity about three axes is determined by the size and configuration of the cutout 70. The cutout 70 is configured and sized to provide on the one hand a substantial degree of unlimited movement, and, on the other hand, to provide a bowl surface segment 66 having an area sufficiently large to assure mechanical integrity of the bowl in supporting the bowl member and for enabling restraint of the same upon the application of a sandwiching force by the spherical body 120. The restraining arrangement is advantageous in that the spherical configuration of the body 120 applies a restraining force across a gap of the cutout and contributes to the rigidity of the bowl member in the area of the cutout. The cutout 70 is at least coextensive with the axis 218 (Fig. 7) thereby enabling the bowl member 28 to rotate 360° about this axis. The cutout is formed for providing that the bowl member may be rotated an angular distance (α) about an axis 222 (Fig. 7). Since the bowl member 28 can be rotated 360° about an axis 218, the angular rotation (α) is effectively doubled. Orientation about the axis 222 is shown in Figure 5. The cutout is also shaped to enable rotation for an angular distance (θ) (Fig. 4) 220. Various orientations about the axis 220 are illustrated in Figures 1 and 11. Thus, a substantial degree of freedom is provided for reorientating the support body 22 to a desired attitude. The size and configuration of the cutout can be varied to suit particular needs. It has been found that the angles (α) and (θ) can

1 equal 40° and 20° respectively while providing sufficient structural integrity for a hemispherical segment 64 formed of a structural polymer foam having a radius of 51 mm and a wall thickness of 5 mm.

5 A quick connect and disconnect mounting means comprises a clamp 92 (Fig. 5, 11 and 15) which is provided for mounting and demounting the base body 24 to the surface 17 of a worktable or bench top. The clamp 92 comprises a formed wire body having horizontal segments 94 and 96 which extend over an upper surface of the work support table, horizontal segments 98 and 100 which extend below a lower surface of the worktable, vertical segments 102 and 104, and segments 106 and 108 for engaging surfaces 109 and 110 in the base body 24. A plate 112 is provided and extends between the lower horizontal segments 98 and 100. An aperture 113 is formed in the plate and a screw 114 engages and extends through the aperture. The screw 114 includes a knob 116 and a tip 118 mounted at opposite ends of the screw for respectively rotating the screw and for engaging the lower section of the worktable. Alternatively, the vise 16 can be screw mounted to a table by screws 115 extending through apertures 117 in the segments 106 and 108 or it can be utilized freestanding without use of any mounting members.

The first gripping member 18 comprises an elongated stationary member having a lower, flat surface 171 engaging support surfaces 36 and 38 (Fig. 2) and upper angled surfaces 173. This member is mounted to the frame by screws 172 and 174. The second jaw member 20 is transported by means including first and second, elongated, rotatably mounted screws 176 and 178. Apertures 180 and 182 (Fig. 3) formed in the frame member 26

1 provide for support of the screws at one end thereof.
The arrangement of the screw support and jaw member
transport is the same for each of the screws 176 and
178. The following description, which is applicable to
5 the screw 176, is equally applicable to screw 178 and
similar components are provided for supporting the
screw 178. A distal segment of the screw 176 extends
through the aperture 180 (Fig. 6) and engages a bore 181
of a crank arm 184. A rotatable knob 186 is pressed on
10 and captivated by a lever segment 183 of the crank arm.
A plate or washer 188 is positioned on the screw ad-
jacent a wall segment of the frame member and a pin 190
extends through a transverse bore 191 in the screw for
inhibiting longitudinal movement of the screw through
15 the aperture. The pin and washer as well as a surface
193 on the crank arm inhibits movement of the screw 176
in an axial direction. The screw 176 is supported at
another location along its length and is mechanically
coupled to the transported jaw 20 by a travel body or
20 pivot nut 192. The body 192 includes an internally
threaded bore 198 which is engaged by the screw 176.
A shoulder 200 is formed on the body 192 and an aper-
ture 201 is formed therein. A screw 202 extends through
this aperture and engages the gripping member 20 in a
25 bore 205. The screw 202 while engaging the gripping
member 20 includes a flat head segment 203 and is
freely rotatable in the aperture 201. Upon manual
rotation of the crank arm 184, the screw 176 rotates
causing movement of the travel body 192 in an axial
30 direction in accordance with the direction of the ro-
tation of the crank. Screw 202 extends through the
elongated slot 42 formed in the frame member 26 sur-
face 38 and causes jaw member 20 to travel therewith.
As indicated, a similar supportable arrangement is
35 provided near an opposite end of the member 20. By

- 1 rotating cranks 184 and crank 207, the jaw member 20
is advanced and retracted relative to the stationary
member 18 with jaw face 209 and 211 (Fig. 6) thereof
parallel. By rotating only a single crank or by rota-
5 ting the crank at different rates, the jaw faces 209
and 211 are positioned anti-parallel. This is advanta-
geous in that tapered and wedge shaped workpieces can
be conveniently gripped by the jaw faces.
- 10 In addition to gripping a workpiece directly with the
jaw faces, the workpiece can be gripped through the
use of swivel members 213 which are rotatably posi-
tioned in apertures 215 (Fig. 16, 17) formed in a jaw
member. A swivel includes a ridge 217 and swivels on
15 opposite jaws are employed to support a workpiece which
is positioned in the ridges 217. The jaws 18 and 20
are spaced apart a substantial distance in the descri-
bed arrangement by advancement of the transportable
member 20 along the frame member surface. This spacing
20 is further increased through the use of the swivels
213.

An improved portable or stationary vise for moderate or
relatively light working operations has thus been des-
25 cribed. The vise 16 will support a workpiece subjected
to relative moderate to light pounding, hammering, etc.
and during other working operations. It is particularly
useful for hobby work, arts and crafts. The use of a
support body including a frame and a bowl shaped member
30 enables a relatively low cost, light weight vise to be
fabricated of a material such as a polymer plastic yet
which can support a workpiece during the application
of relatively moderate or relatively light working
forces on the workpiece. The vise can be orientated
35 about three axes in a plurality of different attitudes

1 and is locked at a selected orientation. The described
arrangement further enables a limited extension of
centrally gripped elongated workpieces into the interior
of the bowl shaped member. The use of a frame member for
5 supporting the gripping jaw members enables relatively
wide spacing of these jaw members in a portable arrangement and the angularity jaw control enables gripping
of tapered pieces and other non-linear arrangements.

10 While there has been described a particular embodiment
of the invention, it will be apparent to those skilled
in the art that variations may be made thereto without
departing from the spirit of the invention and the
scope of the appended claims.

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10 C L A I M S

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1. An improved vise comprising first and second elongated workpiece gripping members; means supporting said members for relative movement therebetween in a plane for gripping a workpiece; characterized by,

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a) said support means (22) including a bowl shaped member (28);

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b) said bowl member (28) positioned adjacent said plane of movement of said gripping members (18, 20); and,

c) means (24) for supporting said bowl member (28) on a support surface (17).

30

2. An improved vise comprising first and second elongated workpiece gripping members; means supporting said members for relative movement therebetween in a plane for gripping a workpiece; characterized by

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a) said support means (22) including a bowl shaped

1 member (28);

5 b) a stationary base body (24) supporting said bowl shaped member (28) for sliding engagement therebetween; and,

c) restraining means (120) for maintaining said support means (22) in a preselected orientation.

10

3. An improved vise comprising first and second elongated workpiece gripping members; a support body for said gripping members; characterized by,

15

a) said support body (22) including a frame member (26), an aperture (52) and a bowl shaped member (28);

b) said bowl (28) communicating with said aperture (52);

20

c) said bowl shaped member (28) extending from said aperture (52) in a direction transverse to said aperture;

25

d) means for mounting said gripping members (18, 20) to said frame member (26) for varying the spacing between said gripping members and gripping a workpiece (60) therebetween;

30

e) said bowl shaped member (28) having a curved surface segment (66) thereof;

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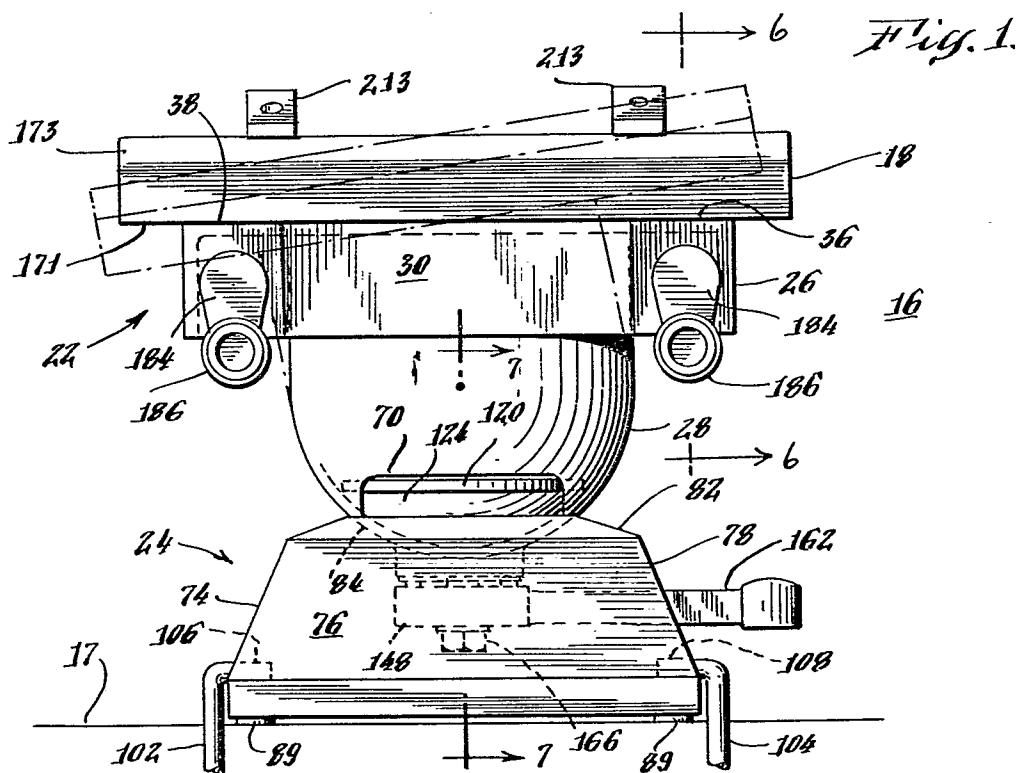
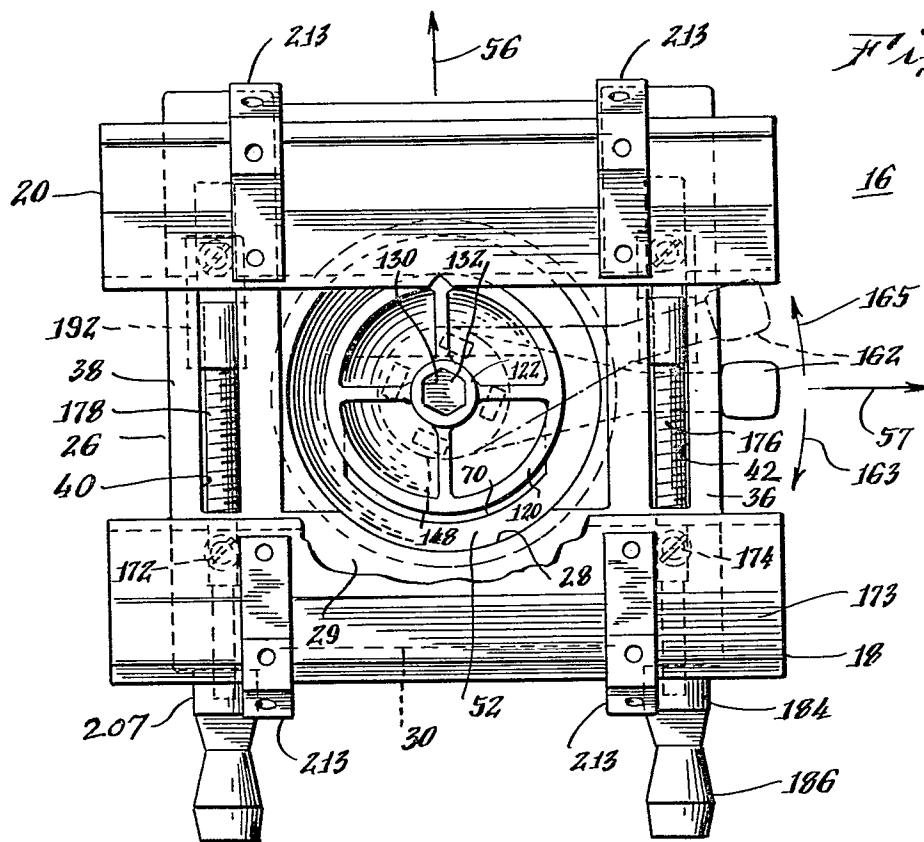
f) a stationary base body (24) having a cavity (84) formed therein;

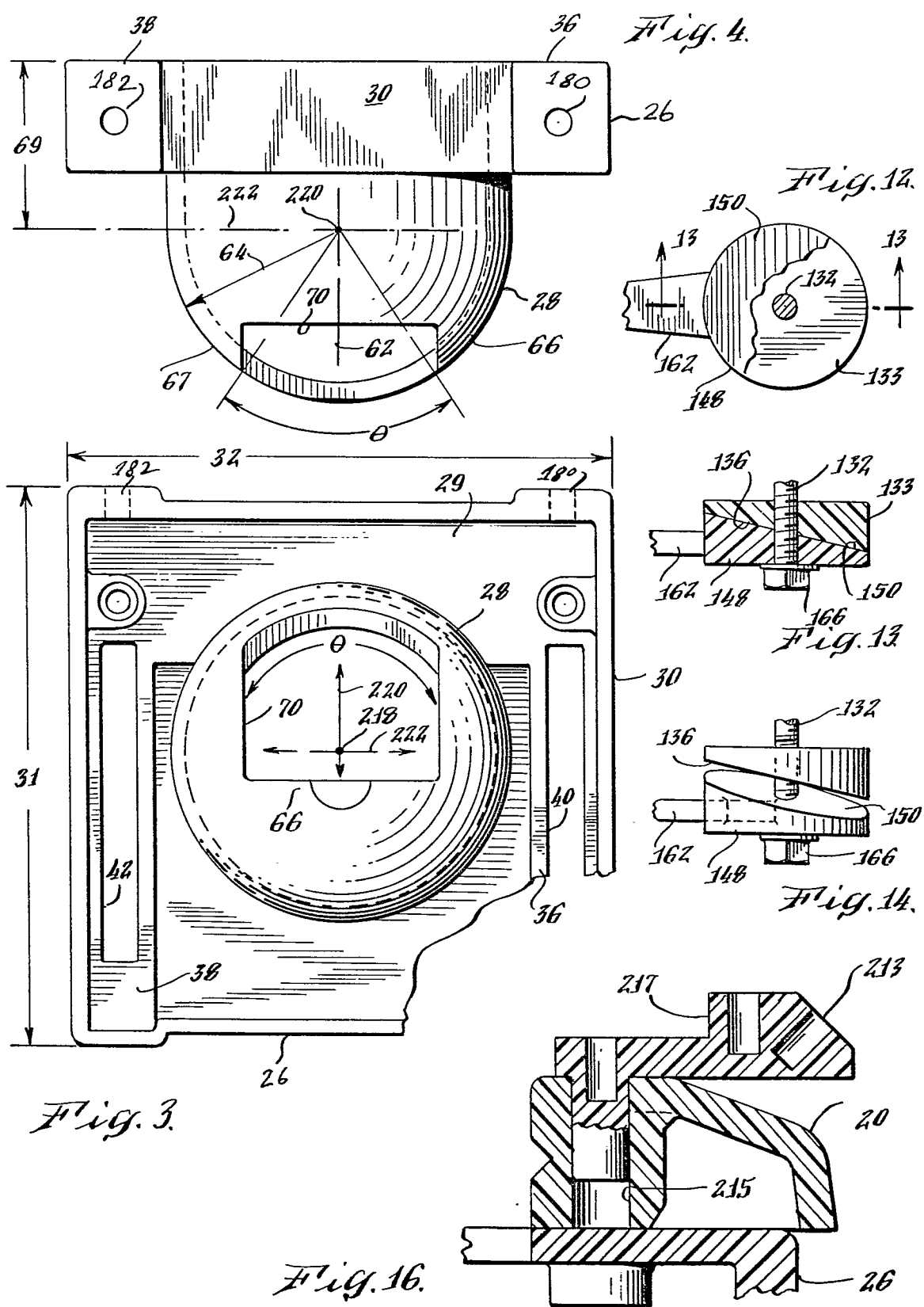
- 1 g) said cavity (84) including a curved surface
segment (86) which conforms in shape with said
curved surface segment (66) of said bowl shaped
member (28);
- 5 h) said bowl member (28) partly positioned in said
cavity (84) for providing engagement between
said curved surfaces (66, 86); and,
- 10 i) restraining means (120) for enabling sliding
engagement between said support body (26) and
said base body (24) at said curved surfaces
(66, 86) and for maintaining said bodies in sta-
tionary engagement at a preselected orientation.
- 15
4. The vise of claim 3 including means (92) for moun-
ting said base body (24) to a support surface (17).
- 20
5. The vise of claim 3 wherein said bowl member (28)
has a longitudinal axis (218) and said restraining
means (120) enables rotary motion of said support
body (22) about said axis.
- 25
6. The vise of claim 3 wherein said restraining means
(120) enables motion of said support body (22)
about first and second, and third mutually perpen-
dicular axes.
- 30
7. The vise according to one of the preceding claims,
characterized in that the said support body (22)
is formed of a polymer plastic and has a first
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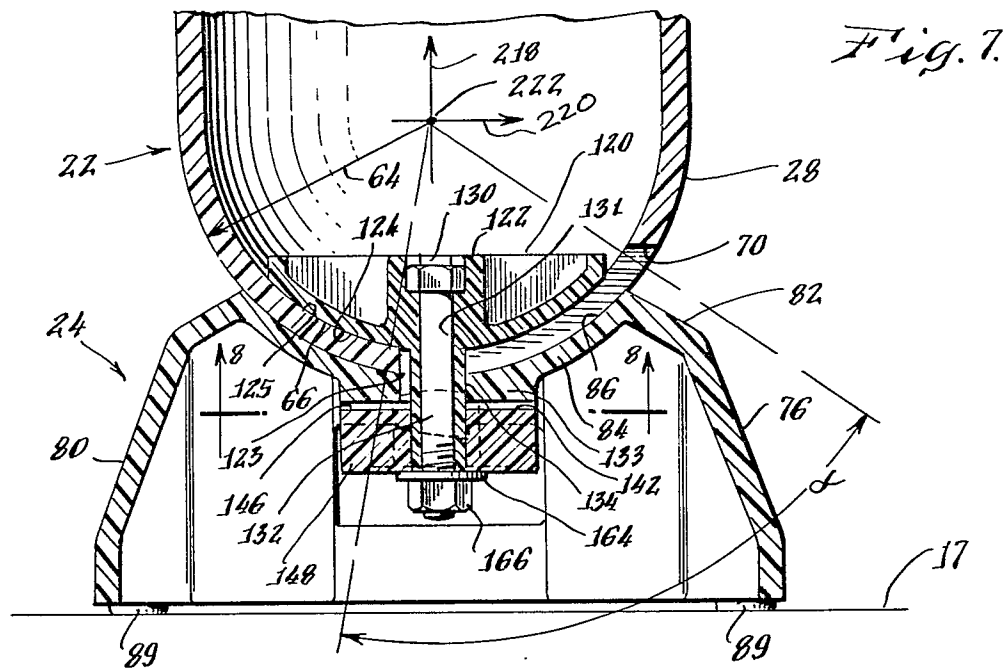
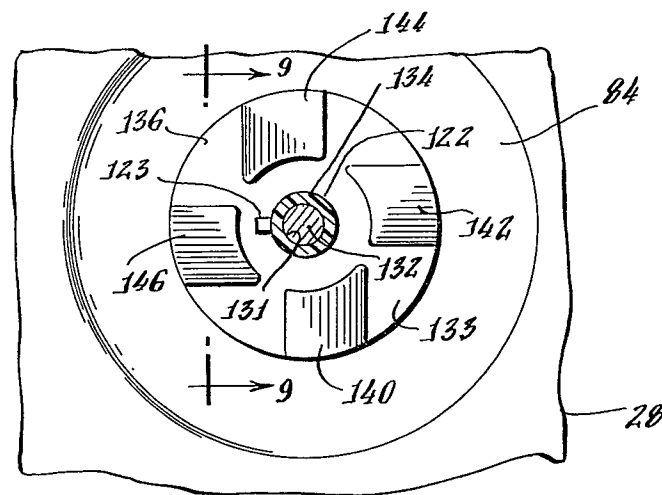
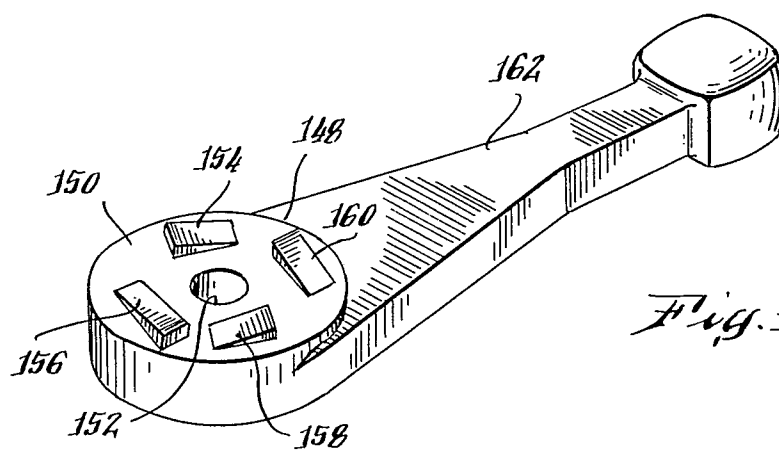
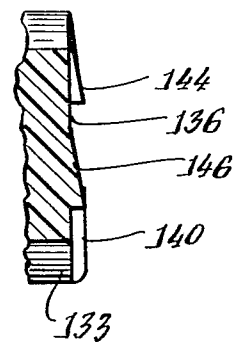
- 1 frame member (26) extending in a plane and a second
bowl shaped member (28) extending in a direction
normal to said plane.
- 5
8. An improved vise comprising first and second elonga-
ted workpiece gripping members, means for mounting
and varying the relative spacing between said mem-
bers for gripping a workpiece therebetween; charac-
10 terized by
- a) said mounting means including a support body (22)
having a frame member (26) defining an aperture
(52) and a hollow body member (28) extending
15 from said aperture (52);
- b) said gripping members (18, 20) positioned adja-
cent to said frame aperture (52) for gripping a
workpiece (60) extending through said aperture
20 (52) and into said hollow member (28);
- c) a base body (24) adapted for engaging and suppor-
ting said hollow member (28); and
- 25 d) means for maintaining said hollow body member
(28) and said base body (24) in stationary enga-
gement.
- 30 9. The vise of claim 8 wherein said hollow body member
(28) includes a first curved surface (66) and said
base body (24) includes a cavity (84) having a
curved surface (86) which conforms in shape with
said hollow body curved surface (66).
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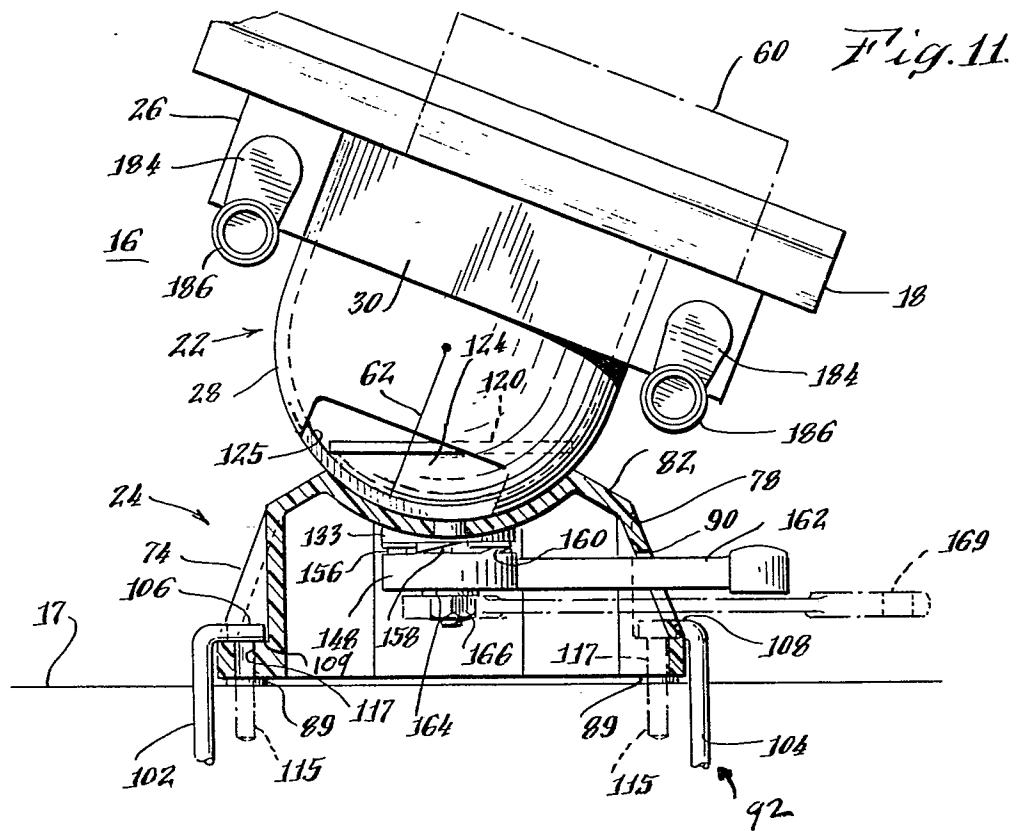
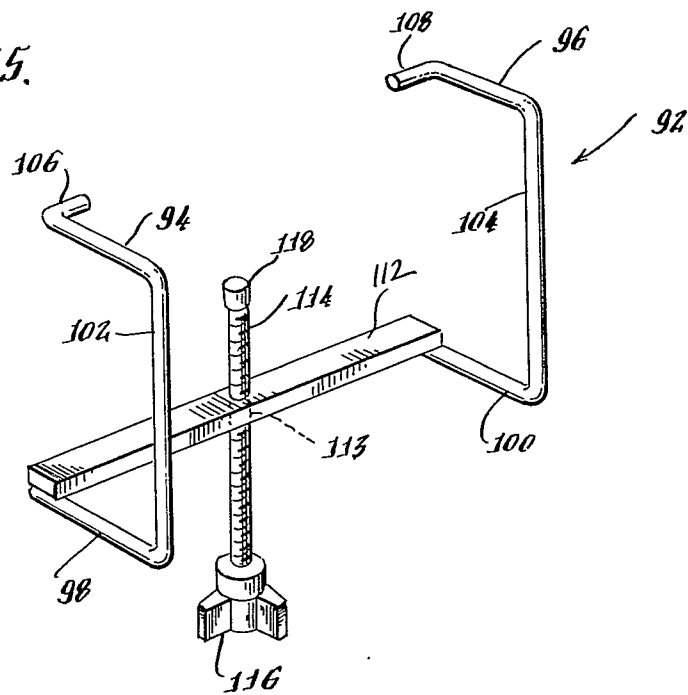
- 1 10. The vise according to one of the preceding claims,
characterized by
- 5 a) said bowl shaped or hollow body member (28) in-
cluding a surface segment (64) thereof confor-
ming with a segment of a hollow sphere;
- 10 b) a base body (24) comprising an elevated platform
(82) including a cavity (84) formed therein,
said cavity having a surface conforming with
said spherical segment (64) of said bowl shaped
or hollow body member.
- 15 11. The vise of claim 10 wherein said spherical shaped
segment (64) comprises a hemispherical segment.
- 20 12. The vise of claim 10 or 11 including a cylindrical
segment (69) integrally formed with said hemisphe-
rical segment (64) and positioned between said hemi-
spherical segment and said aperture (52).
- 25 13. The vise according to one of the preceding claims
characterized by:
- 30 a) a first generally rectangular shaped support
body member (22) having a length, and a width;
- 35 b) said member (22) having a first surface (36, 38)
thereof;
- c) said member defining an aperture (52);

- 1 d) a first, stationary, elongated workpiece gripping
member (18) positioned and supported on said
support body adjacent said surface of said body
member;
- 5 e) a second, transportable, elongated workpiece
gripping member (20) positioned adjacent said
first surface;
- 10 f) means for supporting and transporting said se-
cond workpiece gripping member (20) for varying
the relative positioning of said members in a
plane for gripping a workpiece (60).
- 15 14. The vise of claim 13 wherein said rectangular shaped
body (22) includes first and second slots (40, 42)
formed therein, said means for varying the relative
position of said gripping members (18,20) comprises
20 first and second elongated screws (176, 178) exten-
ding adjacent said first and second slots (40,42)
for rotation about a longitudinal axis thereof,
said means including first and second internally
threaded bodies (192) positioned in engagement with
25 said first and second screws (176,178) respectively
adjacent said first and second slots respectively
and adapted for motion in said longitudinal direc-
tion upon rotation of said screws, means (202)
mechanically coupling said first and second bodies
30 (192) to said second workpiece gripping member (20)
at spaced apart locations for causing motion thereof
relative to said first workpiece gripping member
(18) upon rotation of a screw, and means (186) for
35 manually rotating said screws.





*Fig. 8.**Fig. 9.*

*Fig. 15.*



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DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (Int. Cl.)
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	
	<u>DE - C - 328 027</u> (G. GAMPE) * page 1; fig. * ---	1-6, 8-10, 12	B 25 B 1/22
	<u>GB - A - 872 847</u> (COVENTRY GAUGE & TOOL CO.) * claims 1 to 3; fig. 1, 2, 5 * ---	1	
	<u>CH - A - 206 781</u> (R. MÜLLER-ZOLLINGER) * claim; fig. 3 * ---	1	
	<u>DE - U - 7 212 533</u> (P.F. PEDDINGHAUS) * claim 1; fig. 1 * -----	4	
			TECHNICAL FIELDS SEARCHED (Int. Cl.)
			B 23 Q 3/04 B 25 B 1/00
			CATEGORY OF CITED DOCUMENTS
			X: particularly relevant A: technological background O: non-written disclosure P: intermediate document T: theory or principle underlying the invention E: conflicting application D: document cited in the application L: citation for other reasons
X	The present search report has been drawn up for all claims		&: member of the same patent family, corresponding document
Place of search Berlin		Date of completion of the search 25-08-1980	Examiner HOFFMANN