

- [54] **POSITIVELY LOCKABLE ANGULARLY ADJUSTABLE HANDLE**
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- [73] Assignee: **Weston Instruments, Inc.**, Newark, N.J.
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- [58] Field of Search 220/96, 95; 16/110 R, 126, 16/114 R, 110.5, 111 R, 112; 248/226, 471, 470, 126, 12; 224/45 P

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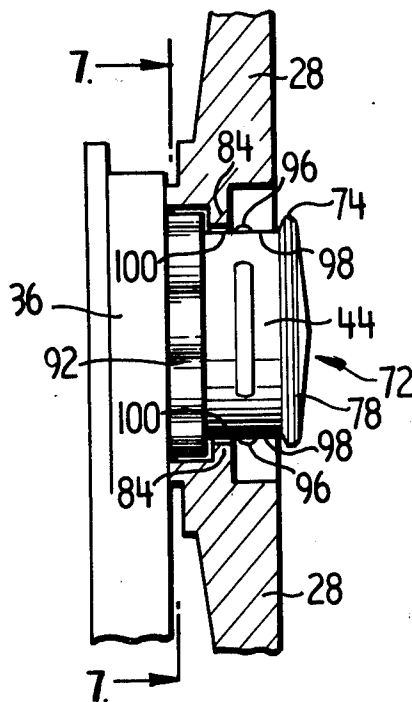
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[57] **ABSTRACT**
 A positively lockable angularly adjustable handle for

portable apparatus is substantially U-shaped and includes two parallel arms interconnected at one end thereof by means of a transversely extending bar and having inwardly projecting tubular journal members at the other ends thereof for mounting the handle within apertures provided within the apparatus. Upon the external surface of the journals there is located, in serial fashion, a peripheral flange, arcuate stop members, and a series of splines, a circumferential bearing surface being interposed between the flange and the stop members and a circumferential recess being similarly interposed between the stop members and the splines. The inner peripheral walls of the apparatus defining the apertures include an inwardly projecting flange and mating splines whereby the journal members may be forced axially inwardly within the apertures to a first position wherein the aperture flange is housed within the journal bearing surface so as to prevent further relative axial movement and the splines are disengaged so as to nevertheless permit free angular movement between the handle and the apparatus, and the journal members may be forced axially inwardly within the apertures still further to a second position whereby the splines interengage so as to prevent angular movement between the handle and the apparatus, the apparatus flange being housed within the recess to again prevent further relative axial movement. Axial retraction of the journals to the first position permits the handle to be adjusted to a different angular position whereupon the same may be once again positively locked against angular rotation relative to the apparatus.

10 Claims, 7 Drawing Figures



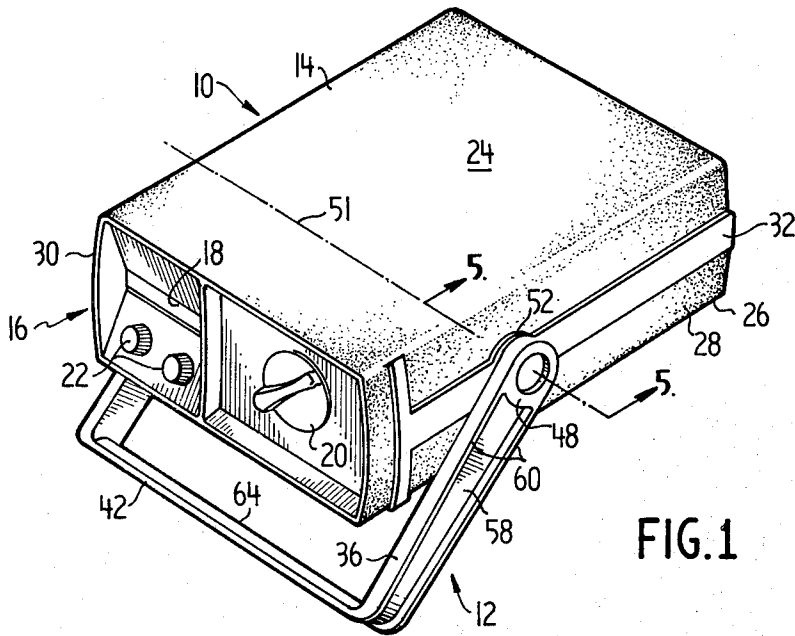


FIG. 1

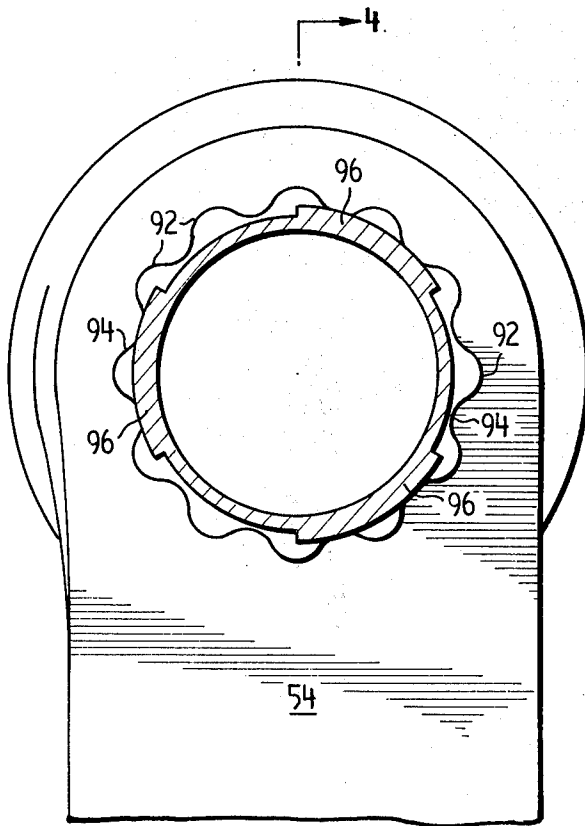


FIG. 3

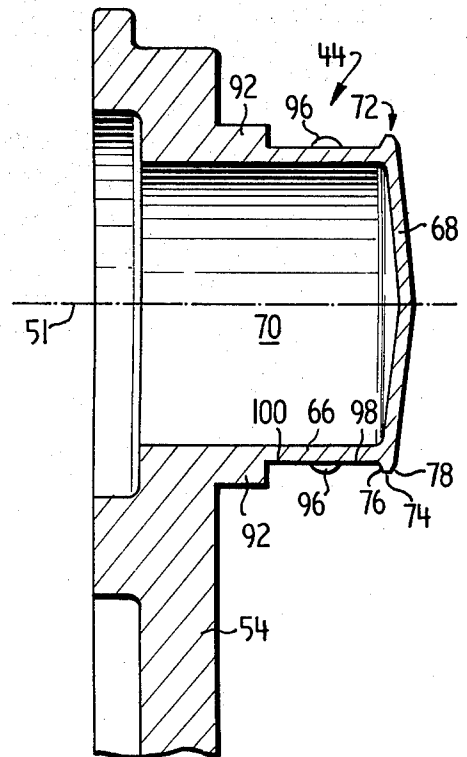
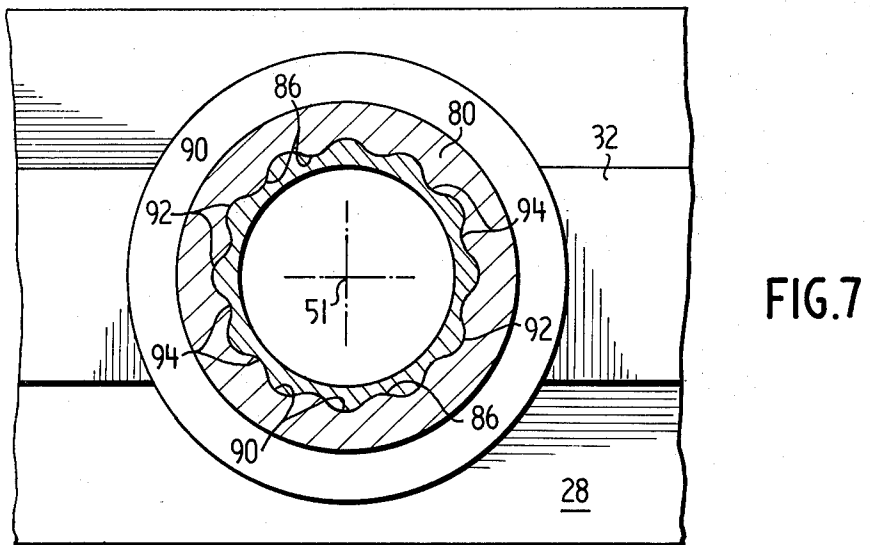
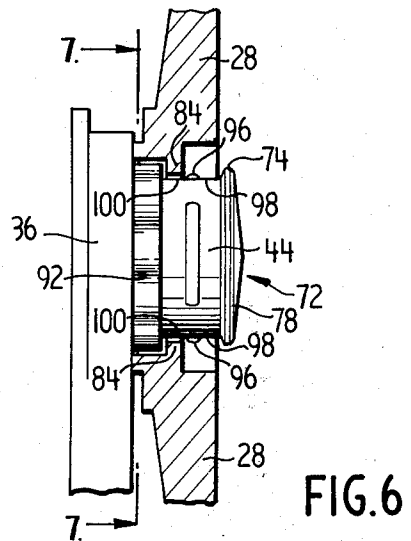
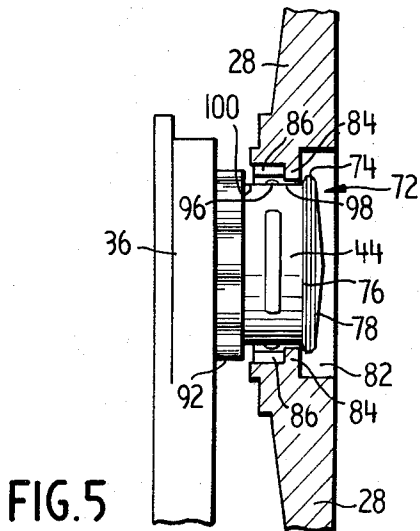
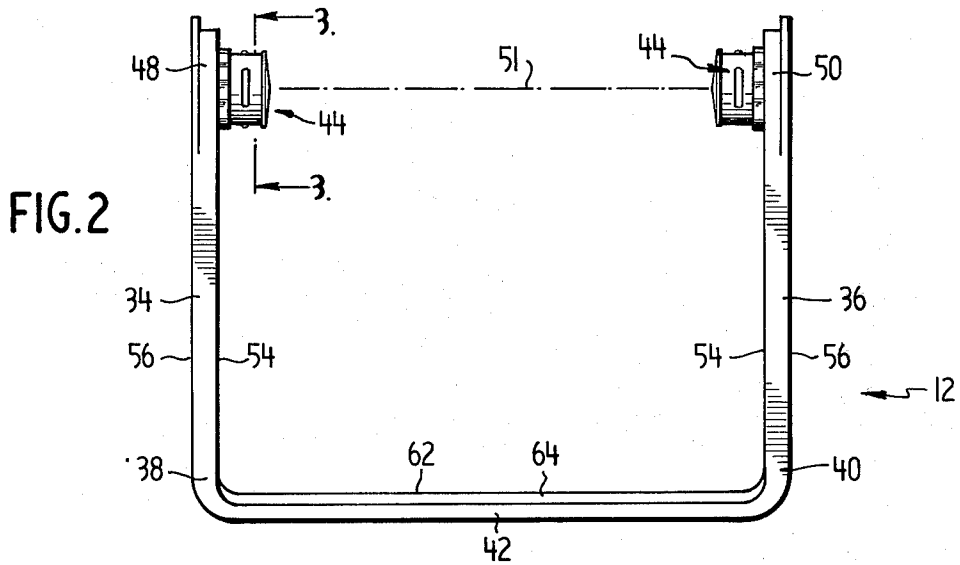


FIG. 4



POSITIVELY LOCKABLE ANGULARLY ADJUSTABLE HANDLE

BACKGROUND OF THE INVENTION

1. FIELD OF THE INVENTION

The present invention relates generally to bails for portable apparatus and more particularly to an improved positively lockable angularly adjustable handle which can be coupled to the apparatus frame or housing in such a manner that the handle can be rotated to and locked within any one of a plurality of selectable angular positions, relative to the frame or housing, whereby the apparatus may be transported or carried when the handle is located within one of several other angular positions, whereupon the handle also serves as a stand.

2. DESCRIPTION OF THE PRIOR ART

Portable apparatus having a frame or housing and an angularly adjustable handle coupled thereto in such a manner that the handle serves as both a means for carrying or transporting the apparatus, as well as a means for supporting the apparatus in one of a plurality of selectable inclined positions upon a planar surface, such as for example, a table, so as to facilitate observance, listening, or manipulation and control of the apparatus, are of course known. Such conventional handle structures normally comprise a pair of parallel arms interconnected at one end by means of a transverse bar and rotatably coupled to the apparatus frame or housing at the other end, the apparatus and handle structures being further provided with means permitting the locking of the handle relative to the apparatus within any one of the selectable angular positions.

The free ends of such conventional handles may further include U-shaped components which are adapted to cooperate with separable bolt members having a knob-shaped head, whereby the handles are rotatably secured to the apparatus housing or frame. By rotating the knob in a particular direction, the handles may be selectively adjusted to a desired angular position relative to the apparatus. Although such apparatus is in fact quite practical, the structure nevertheless suffers from the requirement that a number of structural components, that is, the housing, the handle, and the bolts, are necessary in order to construct a single coupling, whereby substantial expenditures may be incurred both in manufacturing and assembly. In addition, as the bolts are separable from both the apparatus and handle, use of the assembled apparatus tends to loosen the bolts rendering the locking feature ineffective, and furthermore, the bolts may in fact become lost necessitating replacement of the same and obviously preventing the designated use of the assembled apparatus until such replacement is performed.

To overcome the aforementioned disadvantages, one new and improved type of handle coupling that has been recently developed is disclosed in the co-pending and commonly assigned application entitled "Portable Instrument," Ser. No. 288,608, filed Sept. 13, 1972, now U.S. Pat. No. 3,813,004, issued 5/28/74, and the present application is concerned with another new and improved type of handle coupling which has been similarly developed in order to overcome the various disadvantages noted heretofore.

SUMMARY OF THE INVENTION

Accordingly, it is an object of the present invention to provide an improved angularly adjustable handle coupling for portable apparatus.

Another object of the present invention is to provide an improved angularly adjustable handle for portable apparatus which may be adjusted to and lockably secured within any one of a plurality of angularly located positions.

Still another object of the present invention is to provide an improved portable apparatus with an angularly adjustable handle which may be adjusted to and lockably secured within any one of a plurality of angularly located positions whereby the handle may be utilized to carry or transport the apparatus while within any one of several particular angular positions and may also be utilized to support the apparatus within various inclined positions upon a planar surface while within any one of several other particular angular positions.

Yet another object of the present invention is to provide an improved angularly adjustable handle coupling for portable apparatus wherein the coupling structure facilitating the mounting and adjustability of the handle within the apparatus is integral with the handle and apparatus thereby obviating the need for additional separable components.

A further object of the present invention is to provide an improved angularly adjustable handle which is simple and economical to manufacture as well as assemble within the apparatus.

According to this invention, a positively lockable angularly adjustable handle for a portable apparatus is substantially U-shaped and includes two normally parallel arms interconnected at one end thereof by means of a transversely extending bar. Means for coupling the handle arms to the apparatus are provided, including inwardly projecting tubular journal members for mounting into respective apertures, the axially inward ends of the journals being preferably closed by means of an end wall. Associated with each of the end walls is a resilient peripheral flange, and disposed upon the exterior surfaces of the tubular walls of the journals are resilient arcuate-shaped stop members which are axially spaced from the peripheral flange so as to define a circumferential bearing surface therebetween. A series of radially extending splines or lobes are similarly disposed upon the exterior surfaces of the tubular walls and axially spaced from the stop members so as to define a circumferential recess therebetween. Means defining the apertures include an internal peripheral flange and a series of radially extending splines or lobes adapted to mate with the journal splines or lobes. The journal members may be pressed axially through the apertures whereby the journal flanges will be forced passed the internal flanges whereupon the latter flanges will be seated within the journal bearing surfaces. In this condition, the handle may be angularly adjusted to a desired position at which location the journal members may be further pressed axially through the apertures whereby the journal stop members will be forced passed the internal flanges whereupon the latter flanges will be seated within the journal recess and the splines will be interengaged, the handle thus being positively locked in the desired angular position. Axial retraction of the journals disengages the mating splines whereupon the handle may be rotated to a different angular

position and subsequently locked therein by re-engaging the spline members.

BRIEF DESCRIPTION OF THE DRAWINGS

Various other objects, features, and attendant advantages of the present invention will be more fully appreciated as the same becomes better understood from the following detailed description when considered in connection with the accompanying drawings, in which like reference characters designate like or corresponding parts throughout the several views, and wherein:

FIG. 1 is a perspective view of a portable apparatus which may be provided with the positively lockable, angularly adjustable handle constructed according to the present invention;

FIG. 2 is an elevational view of the handle of the present invention;

FIG. 3 is a cross-sectional view of the handle journal member, as illustrated in FIG. 2 and taken along the line 3—3 of FIG. 2;

FIG. 4 is a cross-sectional view of the handle journal member, as illustrated in FIG. 2 and taken along the line 4—4 of FIG. 3;

FIG. 5 is a view, partly in section, of the handle journal member as assembled within the apparatus when the handle is within the freely rotatable condition, as illustrated within FIG. 1 and taken along the line 5—5 of FIG. 1;

FIG. 6 is a view similar to that of FIG. 5 showing however the relative positions of the handle journal member and the apparatus when the handle is within the positively locked position; and

FIG. 7 is a view, partly in section, of the handle journal member as assembled within the apparatus as illustrated in FIG. 6 and taken along the line 7—7 of FIG. 6.

DETAILED DESCRIPTION OF A PREFERRED EMBODIMENT

Referring now to the drawings, and more particularly to FIG. 1 thereof, there is shown a portable apparatus, generally indicated by the reference character 10, having secured therein an angularly adjustable handle, generally indicated by the reference character 12 by means of which the apparatus may be carried, transported, or supported. By way of example, the portable apparatus 10 may be an electrical indicating instrument, the substantially rectangular housing 14 of which may be molded of a tough, shock-resistant plastic material, such as for example, glass-filled polycarbonate, so as to protect the enclosed components. The housing 14 includes a front panel, generally indicated by the reference character 16, which may have disposed therein a meter display window 18, control means, such as for example, a rotatable knob 20 for selecting the sensitivity of the apparatus, and a pair of electrical outlets 22 for the reception of plugs or jacks to be connected to the metering circuitry, as well as a rear panel, not shown, which is disposed parallel to the front panel 16, upper and lower plates 24 and 26 respectively, and side panels 28 and 30. The side panels may have an external reinforcing rib 32 extending longitudinally thereof and centrally interposed between upper and lower plates 24 and 26, and it will also be noted that the length of the housing that is, the distance between the front and rear panels, is greater than the width of the housing or the distance between the side panels, and similarly, the height of the housing is also less than the width thereof,

the housing thereby having a somewhat flattened elongated configuration.

Referring now to FIG. 2, the specific structure of the handle 12 is shown as including two substantially parallel arms 34 and 36 integrally connected at the respective ends 38 and 40 by means of a transversely extending bar 42. Inwardly projecting tubular journals generally indicated by the reference character 44 are similarly integrally disposed upon the opposite ends 48 and 50 of the arms 34 and 36, respectively, by means of which the handle 12 may be rotatably secured, about transversely extending axis 51, within suitable apertures 52 defined within the side panels 28 and 30, as seen in FIG. 1. It will be noted that while the apertures 52 are centrally interposed between upper and lower plate 24 and 26 so as to, in effect, concentrate the weight of the apparatus while being carried along a centrally located plane which would normally include the center of gravity of the apparatus, the apertures are also offset toward the front panel 16 so as to provide sufficient clearance between the handle 12 and the panel 16 when the handle 12 is being rotated to the various angular positions, the handle 12, while in the angular position as seen in FIG. 1, serving as a support means for the apparatus whereby the front portion of the apparatus may be raised above a supporting surface, such as for example, a table, not shown, while the rear portion of the apparatus rests upon the table. In this manner, as the apparatus is inclined relative to the table, the front panel may be particularly visually accessible to a technician whereupon observance and control of the apparatus is facilitated.

The arms 34 and 36 are each provided with a flat inner face 54, while the outer face 56 includes a central carved portion 58 separating ribbed edge portions 60, as seen in FIG. 1, the latter serving to provide rigidity to the arms. The bar 42 similarly has a series of parallel ribs 62 superposed upon the inner face 64 thereof so as to provide the same with a simple handgrip for the fingers of an operator when carrying or transporting the apparatus. As is the case with the housing 14, the handle 12 may be made of a resilient moldable plastic material, such as for example, a polycarbonate, and by virtue of the aforescribed construction, the arms 34 and 36 are seen to be quite flexible within a plane extending through axis 51 and bar 42, but are quite inflexible within planes extending transversely of axis 51.

Referring now to FIGS. 3 and 4, the tubular journal members 44 are seen to comprise an axially extending annular wall portion 66 which is integral with and projects inwardly from the inner face 54 of the handle arms at a location adjacent to the ends 48 or 50, the wall portion being quite thin, and due to the fact that such is formulated of a resilient plastic material, such wall portion may be radially compressed due to a sufficient force being applied to the external surface thereof. The free, inner end of wall portion 66 has integrally associated therewith a substantially transversely extending closure wall 68 which serves to close the inner end of the cavity 70 defined between wall portion 66 so as to provide additional rigidity to wall portion 66, although not to the extent that the resiliency of such wall portion is adversely affected.

The end wall 68 is integrally provided with an annular flange portion, generally indicated by the reference character 72, which is seen to be substantially frustoconical in shape and includes a somewhat rounded surface 74 which extends substantially parallel to axis 51,

an axially outward, sharply inclined surface 76, and an axially inward, inclined surface 78, the degree of inclination of the latter surface being substantially less than that of surface 76. In this manner, when the journal members are pressed axially inwardly so as to be inserted within the apparatus apertures 52, the diametrical extent of which is slightly less than the diametrical extent of flange 72, the resiliency within the flange 72 and the wall portion 66 permits such components to be radially compressed, while the inclined surface 78 properly distributes the compressive forces acting thereon, as well as serving as a guide means for facilitating the entrance of the journals within the apparatus. When the journals have been inserted within the apertures however, and the flange 72 and the wall portion 66 have regained their original positions as in the non-compressed state, the sharp inclination of surface 76 prevents the ready withdrawal of the journal members 44.

Turning now to FIGS. 5-7, the apertures 52 are defined within side panels 28 and 30 by means of an axially outer undulated wall portion 80, as best seen in FIG. 7, and an axially inner cylindrical wall portion 82, there being a coaxial flange 84 projecting radially inwardly interposed therebetween, whereupon apertures 52 are in fact composed of a series of coaxial cavities defined by such wall structures. As best seen in FIG. 7, surface 80 includes an alternate series of radially extending lobes or splines 86 and recesses 88, the radially innermost portions 90 of splines 86 being tangential to a circle coaxial with axis 51 and having a radius slightly larger than flange 72 so as to permit unimpeded movement of the journal members within the apertures, as may be seen in FIGS. 5 and 6. Similarly, the radially inner portion of flange 84 of course has a radial extent less than flange 72 so as to abut and radially compress the same, as mentioned heretofore, as may also be seen in FIGS. 5 and 6.

There are twelve splines and twelve recesses equidistantly distributed about undulated surface 80, and there is similarly integrally provided a series of twelve splines 92 and twelve recesses 94 upon the outer peripheral surface of journal wall portion 66 at a location adjacent to the inner face 54 of the handle arms, as best seen in FIGS. 3 and 4, the splines 92 and recesses 94 serving to lockingly mate with the recesses 88 and splines 86, respectively, when the journal members are moved in an axially inward direction so as to align the splines and recesses within a radially extending plane. It will be appreciated that the radial extent of the splines 92 is just slightly less than the radial extent of the recesses 88, and similarly, the innermost portions 90 of splines 86 are tangential to a circle having a radial extent just slightly larger than innermost portions of recesses 94, and in this manner, as will be more fully apparent hereinafter, the handle 12 may be positively locked within one of the several different angular positions.

Still referring to FIGS. 3 and 4, three arcuate-shaped stop members 96 are integrally disposed upon the outer peripheral surface of wall portion 66 and are interposed between flange member 72 and splines 92, a circumferential bearing surface 98 thereby being defined between flange 72 and members 96, while a circumferential recess 100 is similarly defined between members 96 and splines 92, the bearing surface and recess serving to alternatively house the flange 84 depending upon the axial location of the journals within the apparatus,

as may be seen in FIGS. 5 and 6. The members 96 are equidistantly spaced about wall portion 66 and the radial extent of such members is substantially equal to that of flange 72 whereupon members 96 may abut and be radially compressed by flange 84, in a manner similar to that of flange 72, although such component members will not impede the movement of the journals within the apparatus due to any interference with the splines 86. It will be additionally noted that while the members 96 are arcuate-shaped in cross-section within a transversely extending plane as seen in FIG. 3, members 96 are rounded in cross-section within an axially extending plane as seen in FIG. 4, the latter configuration facilitating the relative axial movement between members 96 and flange 84.

In assembling the handle 12 within the apparatus side panels 28 and 30, as best seen in FIG. 5, upon axial insertion of the journal members 44 within the cavity defined by undulated surface 80 of, for example, panel 28, flange 72 will tend to abut inwardly projecting flange 84. As the inclination of flange surface 78 however, is relatively small, and as the flange is somewhat resilient, application of an axial force, for example upon handle arm 36 and journal 44 will tend to radially compress flange 72 due to the interaction with flange 84, whereupon flange 72 may pass beyond flange 84 and journal members 44 may be snap-fitted into the apparatus side panels. In such first position, flange member 72 is housed within the cavity defined by peripheral wall portion 82, while flange 84 is supported upon circumferential bearing surface 98, the splines 86 and 92 being disengaged, whereupon the handle 12 is freely rotatable within the apparatus. It will be seen that the axial width of flange 84 is substantially equal to bearing surface 98 which is interposed between flange member 72 and stop members 96, and in this manner, although free rotational movement is permitted, relative axial displacement between the handle journals and the apparatus side panels is prevented.

When a particular angular position is selected wherein it is desired to positively lock the handle 12 against rotational movement relative to apparatus 10, axial force may once again be applied to the handle arms and journal members 44 whereupon stop members 96 will now tend to abut flange 84, such axial force serving to radially compress members 96 due to the resiliency and the guiding motion afforded by means of the rounded configuration thereof, as well as the resiliency of tubular wall portion 66, whereby such members 96 may pass axially beyond flange member 84. In this second position, as best seen in FIG. 6, the splines 92 and 86 are now engaged and the flange member 84 is housed within circumferential recess 100. As the splines and recesses associated therewith are substantially identical and in a close-fitting relationship, substantially no play is provided therebetween and consequently, rotational movement therebetween is prevented. Similarly, the width of flange member 84 is substantially equal to the width of recess 100 defined between splines 92 and stop members 96. In addition, axial play in this position is substantially prevented in one direction by abutment of the flat inner face 54 of the arms 36 against the outer surface of panel 28 around the cavity defined by undulated surface 80, as illustrated by FIG. 6, and in the other direction by interaction of the stop members 86 and the flange member 84.

If it is desired to alter the angular position of the handle 12 relative to the apparatus 10, the handle arms and journals 44 may be axially withdrawn. This is easily done, owing to the resiliency of the handle arms in their plane. The stop members 96 pass axially outwardly relative to flange member 84 from the position shown in FIG. 6 to the position shown in FIG. 5, whereupon the splines are once again disengaged and the flange member 84 is housed within the circumferential bearing surface 98 thereby permitting free rotational movement of the handle 12 relative to apparatus 10 whereupon a different angular position of handle 12 relative to apparatus 10 may be selected.

Thus, it may be seen that the positively lockable, angularly adjustable handle of the present invention has important advantages over the known prior art structures in that the handle may be simply and quickly mounted within portable apparatus, the fastening or mounting means being integrally associated with the handle and apparatus as opposed to the use of separable fastening means. In addition, the handle may be angularly adjusted to any one of a plurality of different angular positions relative to the apparatus, whereupon the portable apparatus may be carried or transported, as well as supported upon a planar surface, the utilization of such handle structure thereby being extensive throughout the many diverse fields of technology.

Obviously, many modifications and variations of the present invention are possible in light of the above teachings. It is to be understood therefore that within the scope of the appended claims the present invention may be practiced otherwise than as specifically described herein.

We claim:

1. A portable instrument comprising:

a housing member;

a generally U-shaped resilient handle member having first and second coextensive arms substantially parallel to a plane and having respective first and second ends, said arms being resiliently movable relative to one another parallel to said plane; and

first and second means respectively adjacent said first and second ends for coupling said handle member to said housing member, each said coupling means including:

journal means having an axis and including a tubular resilient wall projecting from one of said members in a generally axial direction,

the other of said members having an internal wall centered on said axis and defining at least one aperture in which said tubular wall is received in a first axial position thereof for rotation about said axis,

inwardly yieldable stop means on the outer surface of said resilient tubular wall,

retainer means within said aperture for engaging said stop means to retain said resilient tubular wall against axial movement within said aperture in one direction between said first axial position and a second axial position thereof axially displaced with respect to said first position in said one direction

when said tubular wall is subjected to an axial force smaller than a given value, and for inwardly camming said yieldable stop means resiliently into said resilient tubular wall upon axial displacement thereof within said aperture in said one direction toward said second axial position when said tubular wall is subjected to an axial force greater than said given value,

first interlocking means disposed upon said one member,

second interlocking means upon said other member for engaging said first interlocking means when said tubular wall is in its said second axial position to lock said handle member in a selected angular locking position with respect to said housing member,

said second interlocking means being disengaged from said first interlocking means when said tubular wall is in its said first axial position for permitting rotation of said handle member with respect to said housing member to select a desired angular locking position for said handle and housing members,

whereby said handle member can be locked in the selected angular position by moving said first and second resilient arms substantially parallel to said plane for causing said resilient tubular wall to shift from its said first to its said second axial position to lockingly engage said first and second interlocking means in the selected angular position.

2. The instrument of claim 1 wherein said retainer means is further cooperatively arranged for engaging said stop means to retain said resilient tubular wall against movement from its said second axial position toward its said first axial position when subjected to an axial force smaller than a given value, while inwardly camming said yieldable stop means resiliently into said resilient tubular wall upon displacement thereof from its said second to its said first axial position when subjected to an axial force smaller or greater than the given value.

3. The instrument of claim 1, wherein said retainer means includes a retainer flange portion inwardly projecting from said internal wall into said aperture, and said stop means includes a plurality of yieldable integral detent projections distributed circumferentially around the outer surface of said resilient tubular wall, the inner radial extent of said retainer flange portion being greater than that of the outer surface said resilient tubular wall and smaller than the radial distance from said axis to the outermost portions of said integral detent projections.

4. The instrument of claim 3, wherein each said coupling means further includes a resilient end flange adjacent one end of said resilient tubular wall the radial extent of the outermost portion of said resilient end flange being greater than the inner radial extent of said retainer flange portion, said resilient end flange having a tapered axial cross section for resiliently deforming said end flange upon forcibly inserting said resilient tubular wall into said aperture past said retainer flange portion, and said retainer flange portion being confined between said end flange and said detent projections in the first axial position of said resilient tubular wall.

5. The instrument of claim 1, wherein said first interlocking means includes a first alternate series of axially directed splines and recesses disposed about the outer peripheral surface of said journal means,

said second interlocking means includes a second alternate series of axially directed recesses and splines disposed upon said internal wall around said aperture for respectively mating with the splines and recesses of said first series at a plurality of angular locking positions distributed about said journal axis; and

each said coupling means further includes abutment means for retaining said resilient tubular wall in the second position thereof against further axial movement in said one direction.

6. The instrument of claim 1 wherein said one member is said handle member and said resilient tubular wall is integral with the respective one of said arms and projects therefrom in the axial direction at the end thereof.

7. A monolithic positively lockable angularly adjustable handle for an apparatus having first and second coupling openings formed therein comprising:

a handle bar of a resilient material having two ends; first and second coextensive arms of the same material integral with said bar and respectively extending from these ends thereof in a normally substantially parallel relationship, and having respective first and second free ends resiliently movable toward and away from one another; and

first and second journal means having an axis, on said first and second arms adjacent said first and second free ends respectively and adapted to cooperate with the first and second coupling openings of the apparatus respectively for rotatably coupling said arms to the apparatus in a first relative axial position thereof and for selectively locking against rotation said arms in a plurality of angular positions with respect to the apparatus in a second relative axial position thereof, each said first and second journal means including:

a resilient tubular wall integral with the respective one of said arms and projecting therefrom in the direction of the other of said arms, said resilient tubular wall being centered on said journal axis and having a free end opposite said respective arm, an integral flange portion outwardly projecting at the outer surface of said tubular wall adjacent the free end thereof,

a series of inwardly yieldable detent projections distributed circumferentially around said resilient tubular wall, said series of detent projections being axially spaced from said flange portion on said tubular wall by a distance sufficient to accommodate therebetween an annular retaining flange inwardly projecting from a respective such coupling opening in the apparatus, in the first axial position of the respective one of said journal means with respect to the apparatus,

said detent projections being resiliently yieldable into said wall portion in response to inward camming action of such an annular retaining flange engaging said detent projections upon forcible axial displacement of said resilient tubular wall in either direction through such an annular retaining flange in the respective opening,

said tubular wall including an outer surface portion between said detent projections series and said respective arm, the axial spacing between said detent projection series and said respective arm being sufficient to accommodate therebetween such respective retaining annular flange of the apparatus in the second axial position of said respective journal means with respect to the apparatus, said second axial position being axially displaced from said first axial position; and

interlocking means integrally formed between said detent projections series and said respective arm and adapted for lockably engaging corresponding

interlocking means on the apparatus in a plurality of angular locking positions when said respective journal means is in its said second axial position.

8. The handle of claim 7 wherein said flange portion has a tapered profile toward the free end of said tubular wall and the smallest diametrical extent of said flange is substantially equal or smaller than the outer diametrical extent of said tubular wall.

9. The handle of claim 7 wherein said interlocking means includes a series of alternate axially directed splines and recesses projecting from said respective arm end and centered about said journal axis.

10. A positively lockable angularly adjustable coupling between a handle and an apparatus comprising: means defining at least one aperture within said apparatus;

at least one journal means having an axis and disposed upon said handle for rotatably securing said handle within said at least one aperture about the axis of said journal means and including a resilient flange member disposed about the peripheral surface of said journal means and integral therewith at an inner axial position, and a plurality of arcuate-shaped resilient stop members of rounded axial cross section disposed about the peripheral surface of said journal means and integral therewith at an outer axial position;

first interlocking means disposed upon said journal means and including an alternate series of splines and recesses disposed about the outer peripheral surface of said journal means;

second interlocking means including an alternate series of recesses and splines disposed upon the inner peripheral surface of said means defining said at least one aperture for respectively mating with said splines and recesses of said first interlocking means at a plurality of angular positions disposed about said journal axis, so as to prevent angular rotation of said handle relative to said apparatus, said first and second interlocking means being disengaged when said journal means is located at a first axial position within said aperture, and being engaged when said journal means is located at a second axial position within said aperture, said second position being axially spaced from said first position, whereby when said first and second interlocking means are disengaged said handle may be freely rotatably adjusted relative to said apparatus to a particular one of said angular positions whereupon said first and second interlocking means may be engaged so as to positively lock said handle against rotation relative to said apparatus;

a radially extending, inwardly projecting flange integrally formed upon the inner peripheral surface of said means defining said at least one aperture, the inner radial extent of said inwardly projecting flange being less than that of said resilient flange member and than that of said resilient stop members;

said resilient flange member and said resilient stop members of rounded axial cross section defining therebetween a circumferential bearing surface and said inwardly projecting flange being received between said resilient flange member and said resilient stop members around said circumferential bearing surface at said first axial position;

said resilient flange member including an axially inner inclined surface and an axially outer inclined

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surface, the degree of inclination of said outer surface being substantially greater than the inclination of said inner surface,

between a circumferential recess adapted to receive said inwardly projecting flange therein at said second axial position,

whereby when said journal means is axially inserted within said at least one aperture, said resilient flange member will abut and be radially compressed by said inwardly projecting flange whereupon said journal means may be snap-fitted into said at least one aperture and said inwardly projecting flange will be supported upon said bearing surface at said first axial position while the ready withdrawal of said journal means from said aperture is substantially hindered; and

whereby when said journal means is further axially inserted within said at least one aperture from its said first to its said second axial position, said resilient stop members will abut and be radially compressed by said inwardly projecting flange whereupon said stop members will move past said inwardly projecting flange which will be housed within said recess at said second axial position and said first and second interlocking means will be engaged whereby said handle will be prevented from rotating relative to said apparatus.

* * * * *

said resilient stop members being axially spaced from said first interlocking means so as to define there-

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