

-1-

A SUPPORT

This invention relates to a support for, for example, setting the height, swivel angle and angle of inclination of viewable display equipment supported thereby such as a monitor, a television or a computer display terminal.

It is required that the screen of viewable display equipment should be settable in position having regard to the viewing direction and the direction of incident light from outside so that displayed information can be seen clearly. Korean Utility Model Publication Nos. 85-2006, 2007, 2008, and Japanese laid open Utility Model Publication No. Sho-42821, describe arrangements for swivelling viewable display equipment and setting the angle of inclination. However, only setting the angle of inclination and the swivel angle is possible and adjustment of height is not provided for, separate height setting means being required to be incorporated in the equipment. If there is no such means, comfortable posture of the user cannot be expected. Further, the mechanism for setting the angle of inclination and the swivel angle is of complicated structure, difficult to make, and the range over which these angles can be adjusted is limited.

A device capable of controlling freely the height of a monitor and the viewing angle of its screen is proposed in Korean Utility Model Publication No. 85-1889. Here a device is proposed in which a recess having several hooking steps is formed in a circular arc on the top surface of a main supporting base, and several supporting grooves are formed on a concave surface. A subsidiary supporting base has a convex surface having several rectangular holes on an upper portion, several

supporting bars downwardly protruding from a bottom surface, and projections having cut out portions formed in a circular arc. Height is determined by setting the subsidiary supporting base on the main supporting base, but there is the problem that the height control distance is limited to the height of the subsidiary supporting base, and there is also the problem that if the subsidiary supporting base is not required it has to be removed from the main supporting base and stored separately.

According to the present invention there is provided a support for display means, comprising a base; first knuckle means including a first boss arrangement, on an arm, releasably fixed to a boss arrangement of the base; and second knuckle means including a second boss arrangement on the arm which is remote from the first boss arrangement on the arm and which is releasably fixed to a boss arrangement of a support plate for display means; release of said first boss arrangement enabling the arm to pivot with respect to the base to enable the height of the supported display means to be selected and release of said second boss arrangement enabling the support plate to pivot with respect to the arm to enable the angle of inclination of the supported display means to be set, each of said first knuckle means and said second knuckle means including tapered pins or knobs coupled in screw-threaded manner at both ends of a screw-threaded bar and entered in tapered bushings that are spring-urged apart, screwing of the tapered pins of each knuckle means towards one another serving to expand the tapered bushings of the knuckle means into contact with tapered portions of the interior of the boss arrangement of the base or of the support plate, thereby to fix the arm with respect to the base and with respect to the support plate. In use of this support the height and angle of inclination of display equipment supported by the support, and hence the angle of inclination and height of the screen of the equipment, can be easily set.

Preferably in the support as just defined the support plate carries means for attachment to a display means, which means comprises co-operating semispherical surfaces held for relative movement against frictional resistance such that the attached display means can be

4.

swivelled with respect to the support plate. In addition to setting height and angle of inclination the swivel angle of the screen of the support equipment can thus be set.

5 For a better understanding of the invention, and to show how the same may be carried out into effect, reference will now be made, by way of example, to the accompanying drawings, in which:

Figure 1 is an exploded perspective view of a
10 support for viewable display equipment,

Figure 2 is a cross sectional side view of the support, shown supporting a monitor,

Figure 3 is a view, half in cross-section, of that part of the support that is attached to the monitor,
15 and

Figure 4 illustrates how height adjustment of the monitor is achieved with the support.

Throughout the drawings, like reference numerals and symbols are used for designating like or equivalent parts or portions, for simplicity of illustration and
20 explanation.

Referring first to Figures 1 and 2, the support has a base 1 to a rear edge of which is fitted a first knuckle N1. This first knuckle N1 includes a boss 4a
25 on an arm 3 and two bosses 2a, 2a provided, spaced-apart, on the rear edge of the base 1, the boss 4a being provided at the bottom edge of the arm 3 and being fitted between the bosses 2a, 2a and releasably held in place by tapered bushings 6a, 6a respectively

inserted through the bores 5a, 5a of the bushes 2a, 2a into the bore 7a of the boss 4a.

- The bore 7a of the boss 4a tapers from each outer end so as to become narrower towards its middle portion.
- 5 Thus the tapering surface portions of the bore 7a are fully contacted by the tapered bushings 6a, 6a inserted thereinto.

- Tapered pins 8a', 8a' of knobs 8a, 8a are respectively inserted into the tapered bushings 6a, 6a, and screw-threadedly engaged with a screw-threaded bar 9a which is within the bushings 6a, 6a and the boss 4a. By turning the knobs 8a, 8a the tapered pins 8a', 8a' are caused to move along the screw-threaded bar 9a inwardly or outwardly, and since such movement of the tapered
- 10 pins 8a', 8a' causes the tapered bushings 6a, 6a to expand outwardly or contract inwardly, the surface contact force between the bushings 6a, 6a and the tapering surface portions of the bore 7a can be varied.

- If the knobs 8a, 8a are rotated in a releasing sense, that is to move the tapered pins 8a', 8a' outwardly, corresponding outward movement of the tapered bushings 6a, 6a is ensured by the action of a compression coil spring 10a contained within the interior of the boss 4a.
- 20

- 25 Within the bores 5a, 5a of the bosses 2a, 2a, at the end portions that face each other, there are recesses 11a, 11a in which there are received, each anchored at one end, torsion springs 12a, 12a. The other ends of these springs 12a, 12a are anchored in the arm 3. It
- 30 will be seen that there is one of these springs 12a, 12a at each side of the arm 3.

6.

At the top end of the arm 3 a second knuckle N2 is provided, the construction of which is as just described for the first knuckle. Briefly there is a boss 4b that is like the boss 4a, a screw-threaded bar 9b in screw-threaded engagement with each of two knobs 8b, 8b having the same function as the knobs 8a, 8a, and there are tapered bushings 6b, 6b and torsion springs 12b, 12b in recesses 11b, 11b within bores 5b, 5b of bosses 2b, 2b respectively. The tapered bushings 6b, 6b are outwardly urged by a compression coil spring 10b.

In addition, a support plate 13 having a part of a spherical surface is integrally provided on the top of the boss 4b, by which support plate 13 there is supported a semispherical body 14 which is coupled to the bottom of the monitor M (or other viewable display equipment) to be supported. The body 14 is held clamped between a retaining member 15 and the plate 13 by a bolt 16 having its head engaged in the member 15. The bolt 16 is passed through an elongated slot 17 in the body 14 and is secured into the plate 13. The bolt 16 is tightened to an extent such as to leave the semispherical body 14 able to turn through 360° on the support plate 13, and to incline to an extent permitted by the length of the slot 17, against frictional resistance.

There is an annular ring 18 between the body 14 and the plate 13.

Operation is as follows:

When the knobs 8a, 8a provided at both sides of the first knuckle N1 are tightened, the tapered pins 8a', 8a' are moved along the screw-threaded bar 9a towards

one another (the screw-threaded connections being appropriately oppositely handed). This inward motion of the tapered pins 8a', 8a' urges the tapered bushings 6a, 6a to move inwardly, and to expand, so that the
5 external circumferences of the bushings 6a, 6a are urged into strong surface contact with the tapered portions of the bore 7a. By this action the arm 3 is held at any desired position because the knuckle N1 is held fixed by the friction force of the close contact
10 of the tapered bushings 6a, 6a with the tapered portions of the bore 7a.

When the knobs 8a, 8a are released, so that the tapered pins 8a', 8a' are moved outwardly, the tapered bushings 6a, 6a are pushed outwardly by the resilient force of
15 the compression coil spring 10a whereby the close contact with the tapered portions of the bore 7a becomes released. A released condition, of the tapered bushings 6b, 6b with respect to the tapered portions of the bore 7b and which corresponds to the released
20 condition just described, is shown in Figure 3.

The release of close surface contact by the tapered bushings 6a, 6a enables free turning of the arm 3 to be effected, so that the arm 3 can be made to extend upwardly from the base 1 (see, for example, the chain-dot line position shown in Figure 4) or can be folded
25 down onto the base 1 (full line position in Figure 4). By so adjusting the setting of the arm 3 the height of the monitor M can be set. Upward movement of the monitor M is assisted by the effect of the torsion
30 springs 12a, 12a. Once the desired height setting is achieved the monitor M is locked at this height by tightening the knobs 8a, 8a.

In addition to setting its height, the angle of

8.

inclination of the monitor M can be adjusted by releasing the knobs 8b, 8b of the second knuckle N2, setting the monitor at a desired inclination, and tightening again so that the monitor is locked at the
5 selected angle of inclination (compare full lines and chain-dot lines in Figure 4).

Should it be required to turn or incline the monitor M in response to the amount of incident light, and the direction of this light, it is possible to move the
10 monitor M within a range of angle of inclination from -10° to $+15^{\circ}$ and a swivel angle of 360° by operation as follows:

Alterations in the angle of inclination can be achieved by pulling the monitor M frontward or pushing it
15 rearward so that the semispherical body 14 slides (between the member 15 and plate 13) within the range permitted by the elongated hole 17, whereby the monitor M can be stopped at a desired position because the member 15 is held in close contact with the internal
20 surface of the semispherical body 14 by the degree of tightening of the bolt 16 so that the movement of the monitor M is effected against frictional resistance as determined by the bolt 16. If it is desired to turn the monitor M, the semispherical body 14 is turned on
25 the annular ring 18 of the supporting plate 13, turning through 360° being possible also against the frictional resistance as determined by the bolt 16.

Thus, the screen of the monitor M or other viewable display equipment can be set as desired according to
30 the angle of incident light and the strength of the light, and the height can be set to suit the height of the eyes of the user.

**CLAIMS**

1. A support for display means, comprising a base;
first knuckle means including a first boss arrangement,
on an arm, releasably fixed to a boss arrangement of the
5 base; and second knuckle means including a second boss
arrangement on the arm which is remote from the first
boss arrangement on the arm and which is releasably fixed
to a boss arrangement of a support plate for display
means; release of said first boss arrangement enabling
10 the arm to pivot with respect to the base to enable the
height of the supported display means to be selected and
release of said second boss arrangement enabling the
support plate to pivot with respect to the arm to enable
the angle of inclination of the supported display means
15 to be set, each of said first knuckle means and said
second knuckle means including tapered pins of knobs
coupled in screw-threaded manner at both ends of a screw-
threaded bar and entered in tapered bushings that are
spring-urged apart, screwing of the tapered pins of each
20 knuckle means towards one another serving to expand the
tapered bushings of the knuckle means into contact with
tapered portions of the interior of the boss arrangement
of the base or of the support plate, thereby to fix the
arm with respect to the base and with respect to the
25 support plate.
2. A support as claimed in claim 1, wherein each of
said first knuckle means and said second knuckle means
includes a torsion spring arrangement acting to bias the
arm away from the base and the support plate away from
30 the arm.
3. A support as claimed in claim 1 or 2, wherein the
support plate carries means for attachment to a display
means, which means comprises co-operating semispherical
surfaces held for relative movement against frictional
35 resistance such that the attached display means can be

swivelled with respect to the support plate.

5 4. A support as claimed in claim 3, wherein the attachment means includes a bolt tightened to set said frictional resistance, the bolt being passed through a slot in one of said semispherical surfaces such that, in addition to swivelling, the angle of inclination of the supported display means can be altered.

10 5. A support for display means, substantially as hereinbefore described with reference to the accompanying drawings.

