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(56) Documents Cited
GB 2271273 A GB 1474809 A EP 0621436 A2
EP 0064028 A2 US 4928914 A

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(54) Support bracket for a loudspeaker

(57) A wall-mounting loudspeaker support has two spaced arms 19,20 upon which sits a speaker support element 11 having a flat upper surface 23 and a part-spherical lower surface 24. A rotary locking element 29 located below the arms may be tightened or loosened by way of a nut and bolt 39,40. The assembly of support and locking element can slide along the arms and the support element can be oriented to a desired angle on its curved surface within limits allowed by a slot 27 in its base and through which the bolt passes.

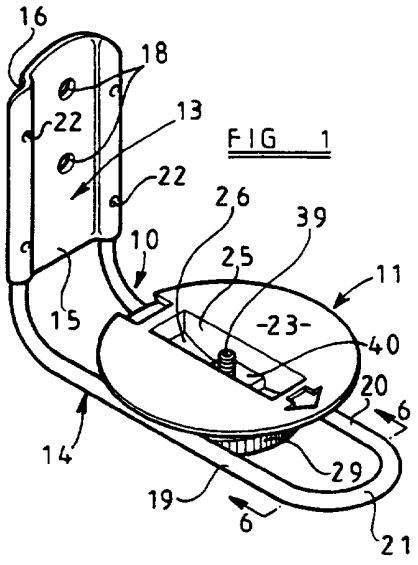

FIG 1

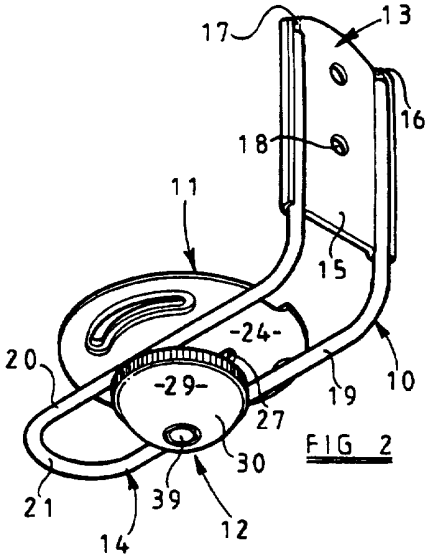

FIG 2

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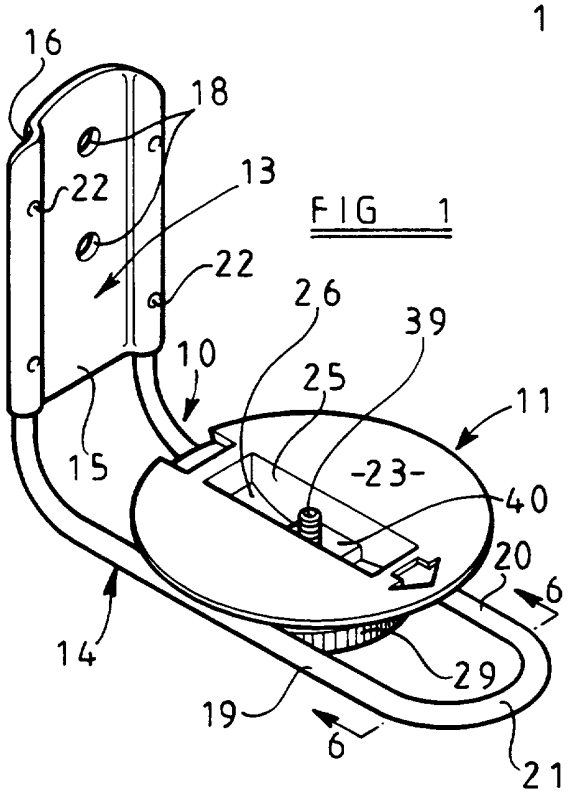


FIG 1

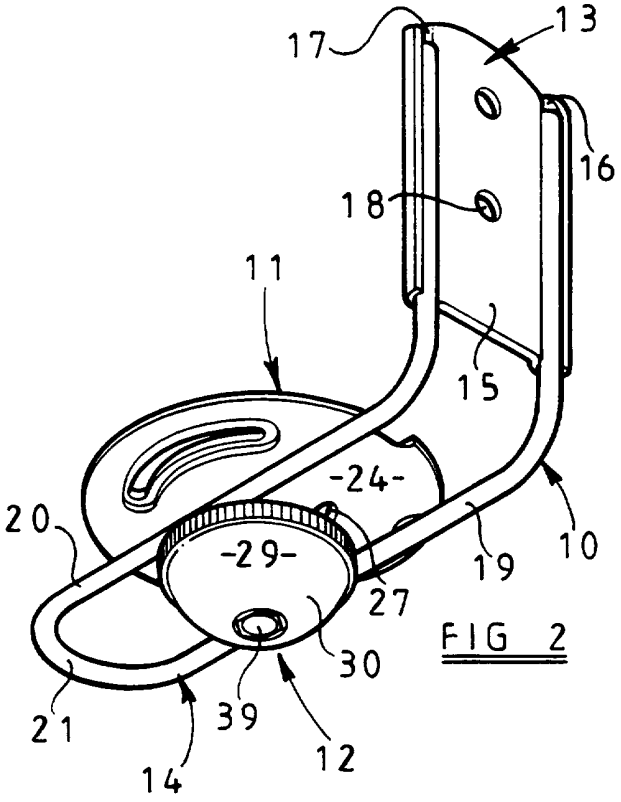


FIG 2

FIG 3

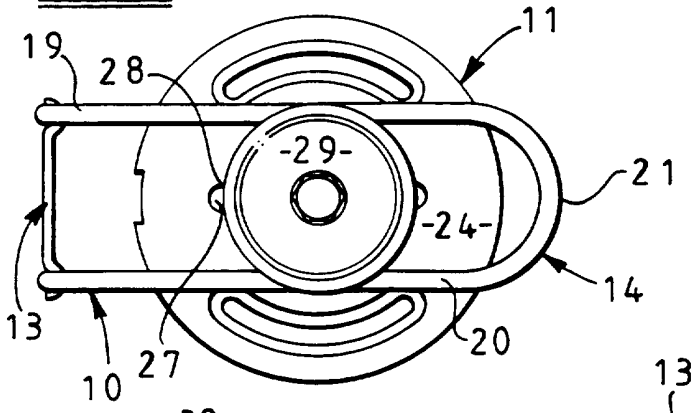
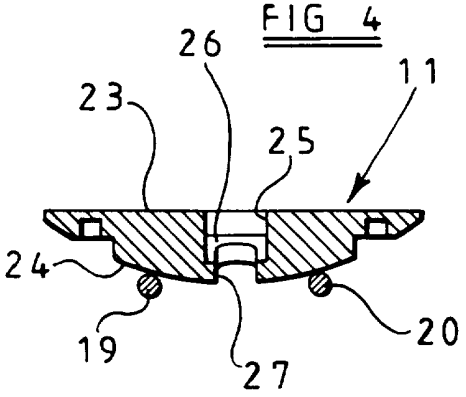


FIG 4



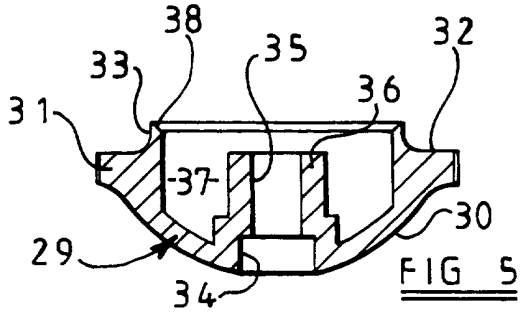


FIG 5

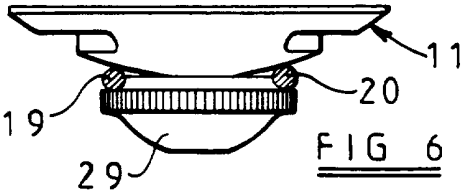


FIG 6

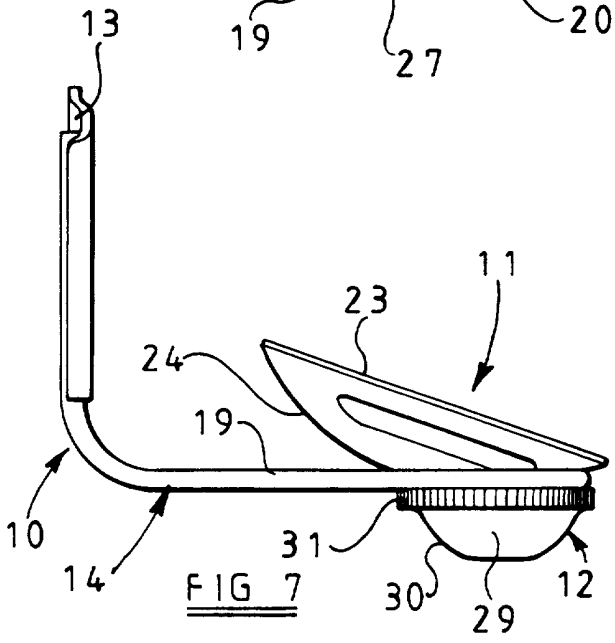


FIG 7

SUPPORTING ASSEMBLY

This invention relates to a supporting assembly intended particularly, but not exclusively, for supporting an audio speaker, such as a surround sound speaker. However it can also be used to support a television, V.D.U. or the like. Normally the assembly is mounted to a wall, usually a vertical wall, or similar surface.

An object of the invention is to provide a supporting assembly with a high degree of adjustability.

According to the invention a supporting assembly comprises mounting means for securement to a surface, in use, a supporting element, and locking means, the mounting means defining a pair of spaced elongate location members, the supporting element having a flat or substantially flat support surface and a part-spherical undersurface, and the locking means being operable to secure the supporting element in a first orientation relative to, and at a first position along the length of, the location members, with said undersurface engaging said location members, release of the locking means allowing stepless adjustment movement of the supporting element to a second position along the length of the location members, with the supporting element remaining in said first orientation or being adjusted to a second orientation relative to the location members, the locking means being operable to secure the supporting element in said adjusted position.

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

Figure 1 is an upper front perspective view of a supporting assembly of the invention,
Figure 2 is a lower rear perspective view of the assembly of Figure 1,
Figure 3 is an underneath plan view of the assembly of Figures 1 and 2,
Figure 4 is a diametral cross-sectional view to a smaller scale of a mounting part and supporting element of the assembly of Figures 1 to 3,
Figure 5 is a diametrical cross-sectional view on a larger scale, of an adjustment knob of the assembly of Figures 1 to 3,
Figure 6 is a fragmentary cross-sectional view on line 6-6 of Figure 1, and
Figure 7 is a side view of the assembly of Figures 1 to 3, with part thereof in an alternative position.

The embodiment of the invention shown in the drawings is in the form of a support bracket intended to carry an audio loudspeaker, particularly a so-called surround sound speaker. However, an enlarged and/or strengthened version could equally well be used to support a television, V.D.U or the like.

In the embodiment illustrated, the support bracket is made up of a mounting part 10, an article support element 11 and locking means 12 for securing the element 11 both in a fixed orientation and also at a fixed position relative to the mounting part as will be described hereinafter.

The mounting part is in the form of a single component made up of a mild steel wall plate 13 to which is welded a wire 14, configurated, as will be described, to constitute means for carrying the element 11 and for allowing it to be locked in a fixed position by operation of the locking means 12.

The wall plate has a flat planar central portion 15, the respective opposite longer sides of which are pressed out of the plane of the portion 15 to form respective part-circular section channels 16,17. Fixing holes 18 are formed in the central portion 15 for the reception of fixing screws or the like to secure the plate 13 to a vertical wall or other surface as required. The wire 14 is configurated to form two straight/parallel elongate arm portions 19,20 respectively, which are integrally connected together at the outer end of the mounting part in the form of an arcuate bend 21. Moreover, at approximately one third along its length from its free ends, the wire is bent arcuately through 90°, with the shorter parts of the arm portions formed by the bending being received into and engaged with the channel 16, 17 respectively by spot welding indicated at 22. Accordingly, when the mounting part is secured to a vertical wall, the longer parts of the arm portions 19, 20 extend horizontally out from the wall surface. However, in other embodiments, these arm portions could extend at angle of other than 90° from the vertical wall, with the relative lengths of the vertical and horizontal parts of the arm portions being varied as required. Moreover the arm portions could be formed from flat strip rather than circular section wire, could be tubular, or could have any other cross-sectional shape suitable to provide location surfaces, for the purpose to be described. The wall plate could be omitted if suitable means for securing the shorter parallel arm portions to the wall surface are provided.

The support element 11 is of plastics material, such as nylon. It has a generally flat circular upper support surface 23 with a part-spherical undersurface 24 extending from the surface 23. Formed in the support surface 23 is a recess 25 which is rectangular in plan, the recess extending diametrically but terminating short of the circumference of the

circular support surface 23. The bottom of the recess 25 is of arcuate, concave form, as indicated at 26, and within this bottom part is formed an elongate, generally rectangular slot 27 which breaks through the undersurface 24, so that the combination of the recess 25 and slot 27 form a passage through the element 11. The slot 27 has longer sides 28, which are parallel to one another and also parallel to the longer sides of the rectangular recess 25.

As mentioned, the function of the locking means 12 is to clamp the support element 11 in a selected orientation relative to, and at a fixed position along, the horizontal part of the mounting part 10, the locking means allowing release when required, so that the orientation and/or position of the support element 11 can be adjusted. As shown best in Figures 2 and 5, the locking means is in the form of an adjustment knob 29, preferably of nylon, having its undersurface 30 of part-spherical form. At the wider, upper end of the undersurface, the knob is formed with an outwardly extending peripheral cylindrical flange 31 which is knurled to enable it easily to be gripped in order to rotate the knob, in use. The flange has a flat annular surface 32 at its side remote from the undersurface 30, this surface 32 surrounding a short upstanding circular lip 33, which is arranged concentrically of the knob.

At the centre of the knob at the lowermost part of the undersurface 30, there is formed a hexagonal recess 34 which leads to a circular section bore 35, the recess 34 and bore 35 having a common central axis, which corresponds to the central axis of the knob 29. The bore 35 is contained within a cylindrical spigot 36 which is upstanding from a hollow interior portion 37 of the knob, the spigot terminating short of the upper periphery of the knob defined by the outer surface of the lip 33. As

shown in Figure 5, the outer, free surface 38 of the lip may be chamfered or generally rounded.

The relative dimensions of the lip 33 and flange 31 are such that the circular lip is closely receivable between the horizontal arm portions of the mounting part 10, whilst the flange, however, is of a diameter too large to be received between the arm portions, and thus, in the locked position of the knob 29, has its annular surface 32 engaging at two generally diametrically opposed positions with the undersides respectively of the horizontal arm portions 19,20 as for example shown in Figures 2 and 6. In this position, the support element 11 is received in engagement on the arm portions 19,20, with the lowermost part of the surface 24 extending slightly below the upper surfaces of the arm portions and just above the chamfered surface 38. However, in an alternative arrangement, for example with a thicker wire, or with the lip 33 being shorter or being omitted, the support element 11 would engage upon the arm portions 19,20 and have its lowermost part well spaced from any part of the knob.

As shown in Figures 1 to 3, a screw or bolt 39 with an hexagonal head is received upwardly through the knob 29, so that the head is received in the complimentarily shaped recess 34, the threaded shank of the bolt passing upwards through the spigot 36 and through the slot 27 into the recess 25. A nut 40 held captive against rotation is received in the recess 25, being threaded onto the end of the bolt 39, so that accordingly the support element 11 and the knob 29 are connected together, with rotation of the knob 29, by virtue of the engagement of the bolt and the nut, causing the two components to move together for

one direction of rotation of the knob 29, and to move apart upon rotation in the opposite direction.

Accordingly it will be appreciated that with the arrangement described, the support element 11 can be adjusted in two ways relative to the mounting part 10. Figures 1 to 3 show the support element 11 disposed approximately mid way between the horizontal arm portions of the mounting part 10, with its undersurface 24 engaged upon the arm portions. In the position shown, the lip 33 is between the arm portions 19,20, the flange 31 being engaged with the respective undersurfaces of the arm portions 19,20 at two generally diametrically opposed respective parts of its annular surface 32. The position shown is, in this embodiment, with the knob fully tightened so that the nut 40 is firmly held at the bottom of the recess 29, with the maximum amount of bolt shank protruding upwardly therefrom. Accordingly, with this arrangement the support element is firmly clamped in position on the mounting part 10. In the position shown, the nut is at the centre of the slot 27, so that as a result the upper support surface 23 is generally parallel to the arm portions 19,20 and thus, in normal use, would be horizontal.

With a surround sound audio speaker, it may often be desirable to tilt the speaker and also to direct it in a particular direction. Accordingly the embodiment of the invention described and illustrated enables this to be effected. Firstly, it is necessary to undo the knob 29 by rotating it in a direction which 'unscrews' the nut from its shank. Because the nut is captive, the rotation of the knob in the unlocking direction results in the shank moving downwardly through the nut, thereby releasing the clamping action of the undersurface 24 and the flange 32 with the

mounting part. When the knob has been unscrewed by a certain amount, it is found that it will be possible to adjust the orientation of the support element by rotating it around the bolt 39, and at the same time sliding it relative thereto so that the nut moves along the recess 25, with the shank correspondingly moving along the slot 27. As the undersurface 24 is of part-spherical form, this new positioning of the nut towards or at an end of the recess 25 causes a tipping of the support element 11, for example to the orientation shown in Figure 7. However, as mentioned above, this tipping could also be arranged to be in a direction at 90° thereto, if the support element 11 is also correspondingly rotated through 90° so that the recess is transverse to the elongate arm portions 19,20.

Once the adjusted orientation has been settled, it is then a simple matter to 'screw up' the knob 29 so that again its surface 32 engages at two generally diametrically opposed positions with the respective undersurfaces of the arm portions 19,20, the rotation of the knob drawing the support element 11 to it so that this is clamped upon the arm portions in the adjusted position, for example of Figure 7.

However, as well as allowing for different orientations of the support element 11, the present embodiment also allows the support element 11 to be moved towards or away from the wall plate 13, Figure 7, for example, showing the support element being positioned at its furthest point from the wall plate 13. This stepless adjustability is a consequence of the mounting part being formed with two spaced location surfaces rather than with any arrangement which requires the locking bolt to pass through part of an arm or the like which carries the support element or other support member associated therewith. Accordingly, it will be

appreciated that once the knob has been released to allow the adjustment in orientation for the support element 11, the loosely connected knob and support element 11 can merely be slid together along the arm portions either towards or away from the wall plate 13 until the desired position for the support element is reached. A tightening up of the adjustment knob 29 will then effect the required clamping so that the support element 11 is then held at its desired fixed position relative to the wall plate 13, with any required adjustment in the orientation of the support element 11 also having been carried out and now having been fixed by the clamping of the element 11 and knob 29 to the arm portions 19,20.

The optional provision of the lip 33 enables the knob to be easily and accurately located relative to the arm portions 19,20 by virtue of the outer surface of the lip being closely received between the arm portions. It will be appreciated that it is not necessary for the whole of the undersurface of the support element 11 to be part-spherical. For example, the support element could instead be in the form of a substantially planar platform having a part-spherical recess therein, preferably at the centre thereof, so that the lower surface of the centre of the platform thus has a corresponding form. Alternatively the support element could have a flat upper surface, with the part-spherical undersurface part merely being formed of a solid projection at the centre of the underside thereof, the recess and slot for the passage of the fixing member being formed accordingly. If required, the function of the lip could be replaced by the provision of a separate support member through which the bolt 39 passes, the knob 29 being movable relative thereto when tightened or released and causing engagement of the

undersurface 24 and the support member with opposite sides of the arm portions of the mounting part.

CLAIMS

1. A supporting assembly comprising mounting means for securement to a surface, in use, a supporting element, and locking means, the mounting means defining a pair of spaced elongate location members, the supporting element having a flat or substantially flat support surface and a part-spherical undersurface, and the locking means being operable to secure the support element in a first orientation relative to, and at a first position along the length of, the location members, with said undersurface engaging said location members, release of the locking means allowing stepless adjustment movement of the supporting element to a second position along the length of the location members, with the supporting element remaining in said first orientation or being adjusted to a second orientation relative to the location members, the locking means being operable to secure the supporting element in said adjusted position.

2. An assembly as claimed in Claim 1, wherein the locking means comprise an adjustment knob, one part of which engages said location members in a secured state of the supporting element.

3. An assembly as claimed in Claim 2, wherein said one part of the adjustment knob is a flange.

4 An assembly as claimed in Claim 3, wherein another part of the adjustment knob, disposed inwards of the periphery of the flange, is closely received between said location members in said secured state.

5. An assembly as claimed in Claim 4, wherein said location members are parallel and said another part of the adjustment knob is cylindrical or part-cylindrical.

6. An assembly as claimed in Claim 5, wherein the flange is circular, defining an annular surface, said another part of the adjustment knob being an annular lip which is concentric with, and extends from, said annular surface of the flange.

7. An assembly as claimed in Claim 6, wherein in said secured state, for each location member, said undersurface of the supporting element engages one surface of the location member and said annular surface of the flange engages an opposite surface of the location member.

8. An assembly as claimed in any one of Claims 3 to 7, wherein the exterior surface of the flange is knurled.

9. An assembly as claimed in any one of Claims 5 to 8, wherein said location members are two parallel arms of an element which is generally U-shaped in plan.

10. An assembly as claimed in Claim 9, wherein the U-shaped element is formed of a single wire defining said two parallel arms connected by an arcuate bend.

11. An assembly as claimed in Claim 10, wherein each arm is angled through 90° so that the element is of L-shape in side view.

12. An assembly as claimed in Claim 11, wherein at the end of the element remote from said arcuate bend a fixing plate with fixing holes therethrough for means securing the mounting means to said surface, in use, is secured to said arms.

13. An assembly as claimed in any one of Claims 2 to 12, wherein the adjustment knob has a threaded fixing member non-rotatably engaged therewith, said fixing member extending through a slot in said undersurface of the supporting element and having engaged on its thread a nut which is non-rotatably received in a recess which is in communication with said slot, so that relative rotation between the adjustment knob and the supporting element, when they are respectively arranged at opposite sides of the location members, either draws them relatively together or moves them relatively apart, so as thus to secure the supporting element to, or release it from, said location members.

14. An assembly as claimed in Claim 13, wherein the inner surface of the recess at which the slot is formed is arcuate.

15. An assembly as claimed in Claim 14, wherein the recess is rectangular, with the slot being of elongate generally rectangular form in plan and extending centrally parallel to the longer sides of the recess.

16. An assembly as claimed in any one of the preceding claims, wherein the supporting element is of plastics material.

17. An assembly as claimed in any one of the preceding claims, wherein the support surface of the supporting element is circular.

18. A supporting assembly substantially as hereinbefore described, with reference to, and as shown in the accompanying drawings.

The Patent Office

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Application No: GB 9713188.2
Claims searched: 1-18

Examiner: R E Hardy
Date of search: 16 September 1997

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.O): A4B; F4R (RMG, RL)

Int Cl (Ed.6): F16M (11/12, 11/16, 11/18); F21V (21/34); H04R(1/02)

Other: Online : CLAIMS, WPI

Documents considered to be relevant:

Category	Identity of document and relevant passage		Relevant to claims
A	GB2271273 A	HAROPA : See the Figures	1
A	GB1474809 A	WANFORD : See the Figures	1
A	EP0621436 A2	VM ACOUSTICS : See the Figures	1
A	EP0064028 A2	REUTEMANN : See the Figures	1
A	US4928914 A	SNODELL : See the Figures	1

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Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
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