(12) UK Patent Application (19) GB (11) 2 337 557 (13) A

(43) Date of A Publication 24.11.1999

(21) Application No 9811163.6

(22) Date of Filing 22.05.1998

(71) Applicant(s)
Knoll International Ltd
(Incorporated in the United Kingdom)
1 Lindsey Street, East Market, Smithfield, LONDON, EC1A 9PQ, United Kingdom

(72) Inventor(s)
Claudio Mainiero

(74) Agent and/or Address for Service
Carpmaels & Ransford
43 Bloomsbury Square, LONDON, WC1A 2RA, United Kingdom

(51) INT CL^6
E04B 2/74 // F16B 12/32

(52) UK CL (Edition Q)
E2A AGB AGKFK A376

(56) Documents Cited
GB 2263931 A **GB 1359480 A** **EP 0663163 A1**

(58) Field of Search
UK CL (Edition P) **E2A AGB AGKFK AGLB**
INT CL^6 **E04B 2/74 , F16B 5/06 5/10 12/32 21/02**
Online: WPI

(54) Abstract Title
Tie and a partitioning system

(57) The present invention relates to a tie 10 for screen partitioning and a partitioning system. In particular, the present invention relates to a tie 10 for connecting two screens or panels together.

The tie 10 comprises a lever 12, at least one lug 14, 15 and a camming surface 32, 34, 36, 38. The tie 10 preferably has two lugs 14, 15, the lugs 14, 15 engaging within a slot of the screens or panels. At one orientation of the tie 10, the camming surfaces 32, 34, 36, 38 do not engage within the slot. Accordingly, the tie 10 may slide within the slot. However, upon rotation of the tie 10 into a second orientation, the camming members 32, 34, 36, 38 engage the slot, thus locking the tie 10 within the slot.

The partitioning system comprises at least two screens, and at least one tie 10. The screens may have a channel 44 in a lateral edge 48 thereof in which the lug can be engaged.

Fig. 4

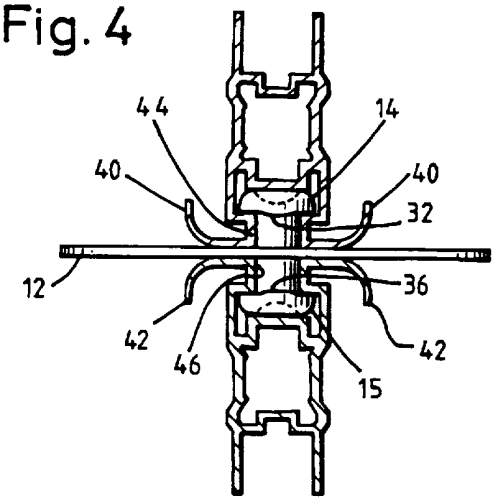

Fig. 5

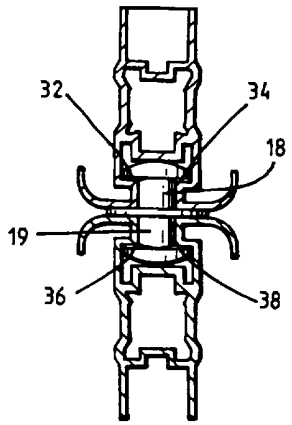

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Fig. 1

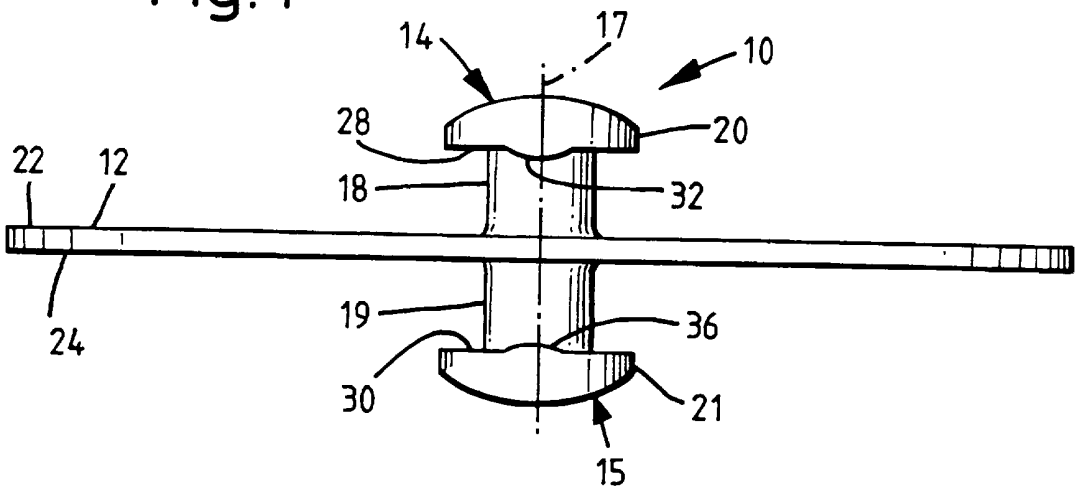


Fig. 2

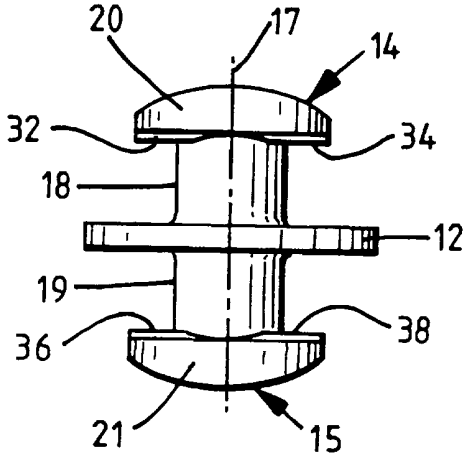


Fig. 3

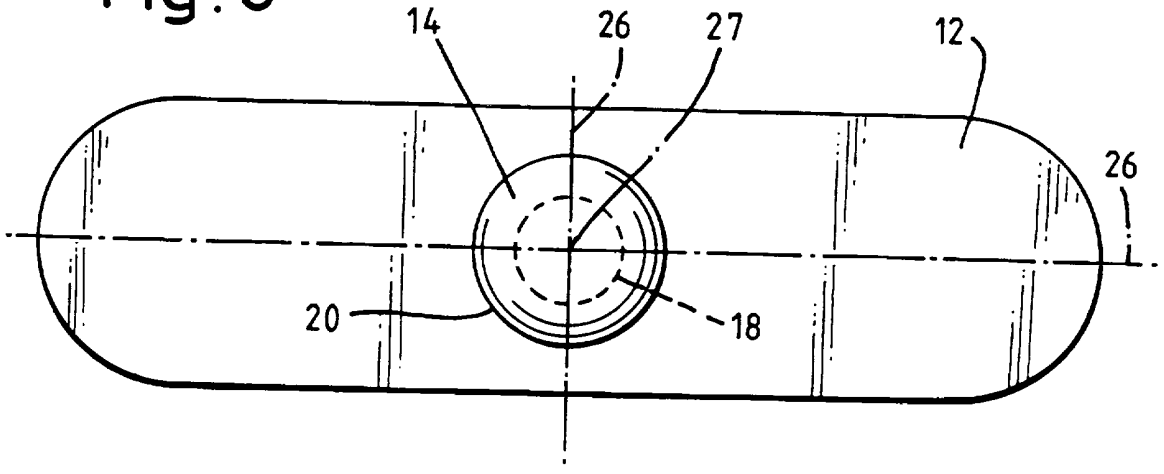


Fig. 4

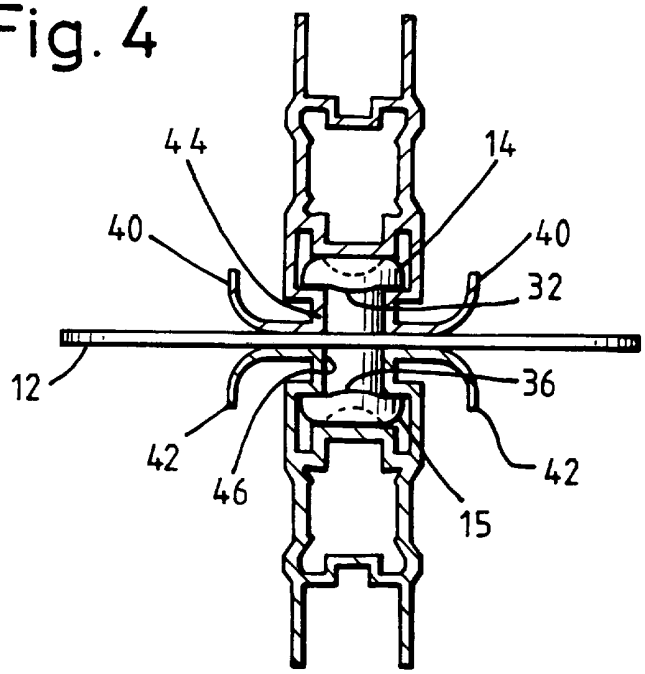


Fig. 5

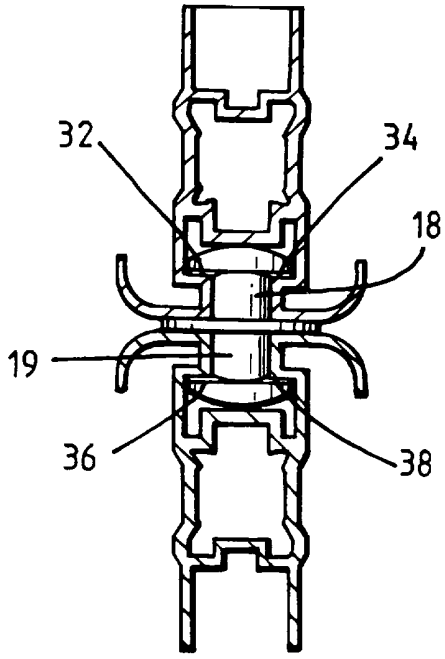
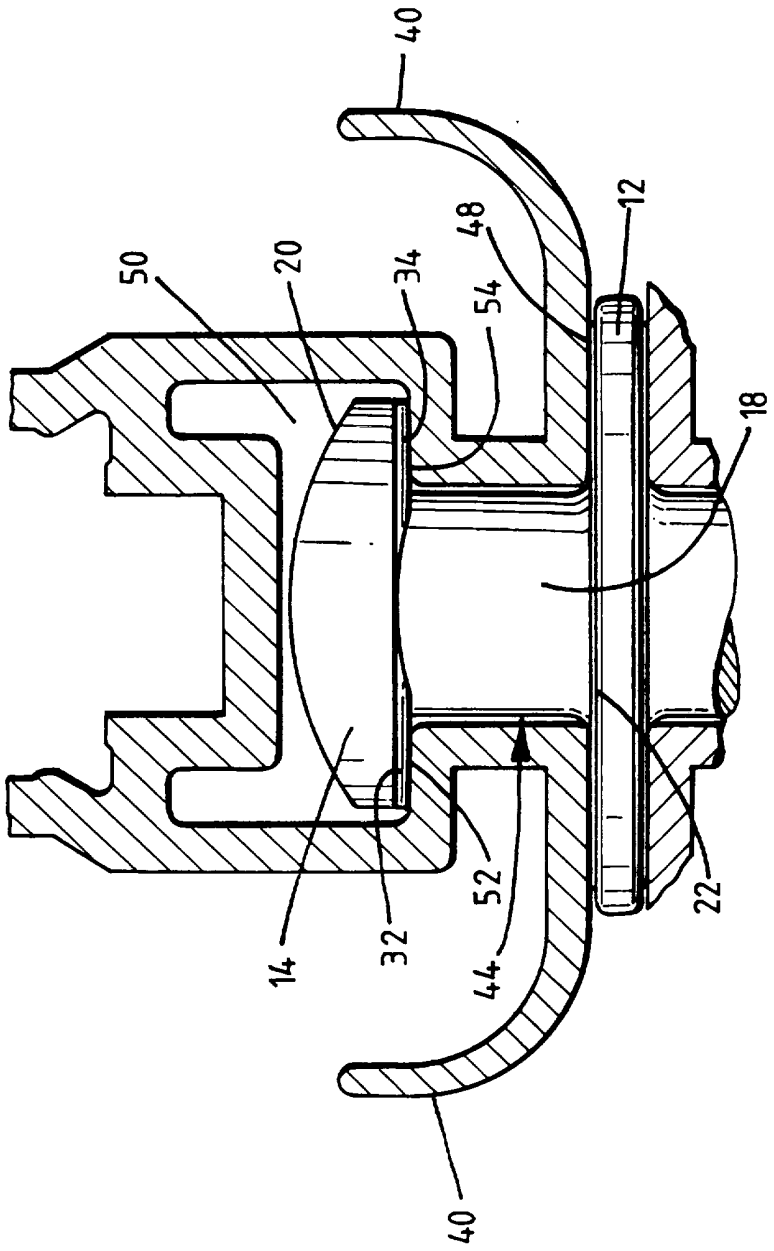


Fig.6



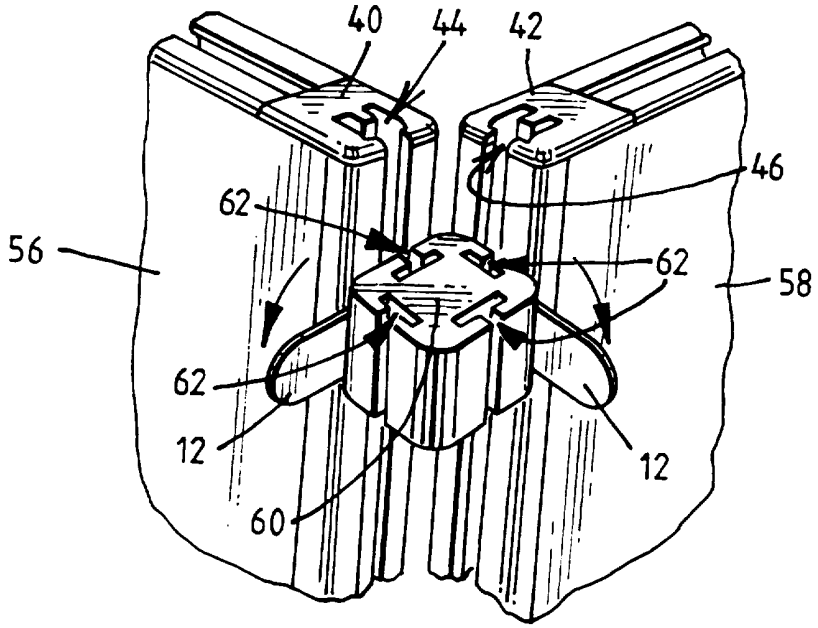


Fig. 7

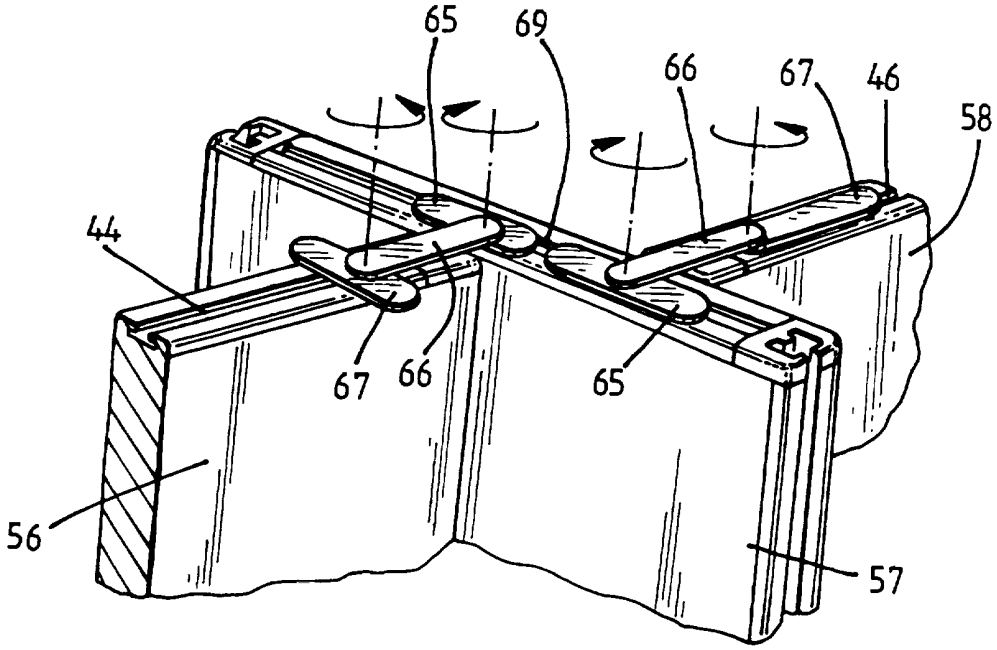


Fig. 8

A TIE AND A PARTITIONING SYSTEM

The present invention relates to a tie for screen partitioning and a partitioning system. In particular, the present invention relates to a tie for connecting two screens or panels together.

Modern day offices often take the form of large open-plan rooms. However, these open-plan rooms regularly need partitioning into separate areas, for example to separate individual work stations. Furniture partitions in the form of multiple screens or panels connected to one another, and optionally mounted to the floor, the ceiling, or to desks, are frequently used for such partitioning. However, it has been found that since it is often necessary to erect and dismantle partitioning on a regular basis, screens have been designed to be fixable only temporarily to one another.

Known screen or panelling systems have screw connections which are labour intensive to erect and dismantle. Some known systems use rigid, fixed height connectors which restrict the relative vertical fixing of adjacent screens or panels to a constant height.

It is also often found that the means used to connect two or more screens or panels together require a secondary tool such as a spanner or screwdriver.

Accordingly, it is the object of the present invention to provide a tie for connecting two or more screens of a partitioning system together which is versatile, easy to use and which does not require the use of additional tools for erection and dismantling.

According to a first aspect of the present invention, there is provided a tie for connecting two components, the tie comprising a lever and at least one lug wherein the tie includes a camming surface.

Preferably, the components are screens, panels or furniture partitioning.

The camming surface may be formed on a surface of the at least one lug. Preferably, the camming surface is on the underside of a flange of the lug.

In a preferred embodiment of the present invention, the tie comprises two lugs, each lug having a camming surface. The two lugs may have substantially parallel axes, and are preferably coaxial and directionally opposed. The lever may extend in a first direction from the lug, but advantageously extends either side of the lug.

The lug may be mushroom shaped, with the flange of the lug forming a cap portion of the mushroom shaped lug. The underside of the flange is preferably flat, except for the camming surface. In the preferred embodiment, the flange portion of each lug each has two camming surfaces. The apex of each camming surface advantageously lies orthogonal to a longitudinal axis of the lever.

In an alternative embodiment, the tie comprises three levers, hingedly connected to one another, with two of the levers supporting a lug and the other lever connecting the levers with the lugs.

There is also disclosed a tie in combination with an intermediate profile having channels in which the lug can be engaged.

According to a second aspect of the present invention there is provided a partitioning system comprising at least two screens, and at least one tie comprising a lever and at least one lug, the tie including a camming surface, at least one of the screens having a channel in which the lug can be engaged.

The tie is engageable with the screens by engaging at least one lug of the tie within an engagement point, for example a hole or a slot, e.g. the channel, on each of the screens. The channel forms one of the engagement points, and it has a tolerance relative to the lug engageable therein to allow the lug to move therein as described below; upon engagement of the lug within the channel, the tie may be rotated about the lug's longitudinal axis. With the lug in

one orientation, the tie is free to slide within the channel. However, rotation of the lever to place the lug into a second orientation causes the camming surface of the tie to bear against a profile of the channel thus securing the tie in a fixed position within the channel of the screen.

At least one of the two engagement points is preferably formed at a lateral edge of at least one of the two screens. The lateral edge preferably comprises an aluminium edge profile having an engagement point in the form of a slot for engaging with a lug. The screens may further comprise engagement points in their central portion to allow, for example, arrangement of the screens in T-shape configurations.

The partitioning system may comprise an intermediate profile and at least two ties. The profile preferably has channels for accommodating lugs having transverse axes lying at relative angles to one another. The relative angle is preferably a right angle.

Various embodiments of the present invention will now be described by means of example only, with reference to the accompanying drawings in which:

Figure 1 is a side elevation of a tie according to the first or second aspects of the present invention;

Figure 2 is a front elevation of the tie of Figure 1;

Figure 3 is a plan view of the tie of Figure 1;

Figure 4 shows a partitioning system according to the second aspect of the present invention including the tie of Figure 1 in a first, unlocked orientation;

Figure 5 shows the partitioning system of Figure 4 with the tie of Figure 1 in a second, locked orientation;

Figure 6 shows a detail of the partitioning system of Figure 5;

Figure 7 is perspective view of a second embodiment of a partitioning system according to the second aspect of the present invention including an intermediate profile and two ties; and

Figure 8 is a perspective view of a third embodiment of a partitioning system according to the second aspect of the present invention including a tie having three levers hingedly connected to one another.

Referring to Figures 1 to 3, there is disclosed a tie 10 for connecting two components. In this described arrangement, the components are partitioning screens or panels. The tie 10 comprises a lever 12 and two lugs 14, 15. The two lugs 14, 15 have a common longitudinal axis 17 and each lug 14, 15 is approximately mushroom shaped, having a stalk portion 18, 19 and a cup portion 20, 21. The cup portions 20, 21 define an annular flange extending around the stalk portions 18, 19. The lever 12 is an elongate planar member having a top surface 22 and a bottom surface 24, and rounded corners as shown in Figure 3.

The first lug 14 extends from the central part of the top surface 22 of the lever 12, as defined by the point of intersection 27 of the two mirror axes 26 of the lever 12. The second lug 15 extends from the lever 12 in the central part of the bottom surface 24 of the lever 12.

The axis 17 of the lugs 14, 15 and the two mirror axes 26 intersect at a central point 27 with each axis being perpendicular to each other axis.

Underside 28 of the first lug 14 faces the top surface 22 of the lever 12 and underside 30 of the second lug 15 faces the bottom surface 24 of the lever 12.

On the undersides 28, 30 of the cup portions 20, 21 of the two lugs 14, 15, i.e. the annular flanges, there are formed pairs of camming surfaces 32, 34; 36, 38. The undersides 28, 30 of the two lugs 14, 15 are generally flat except for the camming surfaces 32, 34; 36, 38. Each pair of camming surfaces 32, 34;

36, 38 forms a raised portion on the flanges. The raised camming surfaces 32, 34; 36, 38 define apexes lying radially on the annular flanges, and orthogonal to the longitudinal axis of the lever 12.

The tie 10 of the present invention is adapted such that each lug 14, 15 can fit within an engagement point of a screen.

Figures 4 and 5 show the tie 10 of Figures 1 to 3 connecting two edge profiles 40, 42 each adapted to fit along an edge of a screen, not shown. The edge profiles 40, 42 are preferably made from aluminium. The edge profiles 40, 42 each comprise a slot 44, 46. These slots 44, 46 run at least part of the length of the edge profiles 40, 42. Multiple intermittent slots may alternatively be provided.

The mushroom shaped lugs 14, 15 may be inserted into the slots 44, 46 via the top or the bottom of each slot 44, 46. Else, there may be provided keyhole ports along the slots 44, 46 to permit insertion of the lugs 14, 15 within the slots 44, 46 at points other than the top or the bottom of the slots 44, 46.

A detail of a lug 14 within the slot 44 is shown more clearly in Figure 6. The slot 44 extends perpendicularly into the edge profile 40 from a front face 48 of the edge profile 40. The depth of the slot is fractionally less than the length of the stalk portion 18 of the lug 14 to be inserted therein allowing a tolerance for the movement of the tie within the slot. This fraction is slightly less than the height of the camming surfaces 32, 34.

The slot 44 is provided with an innermost opening or cavity 50 sized to accommodate the cup portion 20 of the lug 14, the cavity 50 having two shoulders 52, 54 for engaging with the flange of the cup portion 20 and in particular, the camming surfaces 32, 34 provided thereon.

The width of the slot 44 is proportioned to accommodate the stalk portion 18 of the lug 14. However, the slot 44 is sufficiently narrow to prevent the cup portion 20 passing therethrough. Accordingly, a mushroom shaped lug 14 may only be inserted into a position transversing the slot 44 via the ends of the edge

profile 44, or through the optional keyholes provided therefor. Alternatively, a T-shaped lug may be provided for insertion at any point thereon. In this manner, the multiple intermittent slots may be utilised without keyholes.

A lug 14 is inserted into the slot 44 with the camming surfaces 32, 34 at the orientation shown in Figure 4, i.e. running within the slot 46, and away from the shoulders 52, 54. In this way, the tie 10 is free to slide along the slot 46 into a preferred position, or engagement point. At the preferred position, the lever 12 is rotated 90° about the axis 17 of the lug 14 into the position shown in figures 5 and 6. This rotation of the tie 10 brings the camming surfaces 32, 34 on the flange of the cup portion 20 into engagement with the shoulders 52, 54.

As shown, the first orientation has the lever 12 oriented perpendicular to the edge profile. In this way, in the unlocked position, the lever 12 may be easily accessed when positioned between the two edge profiles 40, 42 as shown in Figure 4. However, upon rotating the lever 12 into a second orientation, i.e. the locked position, at an angle of 90° to the first orientation, the lever 12 becomes concealed between the edge profiles 40, 42. In this manner, accidental disassembly of the screens will be avoided. In order to disassemble the screens, a narrow implement, such as a coin, a key or a finger tip may be pushed against the lever 12 to partially rotate the lever 12 and accordingly to allow the lever 12 to be grasped and rotated back to the first orientation for disassembly.

Engagement of the camming surfaces 32, 34 against the shoulders 52, 54 respectively, draws the lugs 14, 15 into a tight fit within the slots 44, 46. The lug 14 will be secured firmly within the slot 44 with the top surface 22 of the lever 12 bearing against the front face 48 of the edge profile 40, and the camming surfaces 32, 34 bearing against the shoulders 52, 54. A similar locking will occur for the second lug 15 within the slot 46 of the second edge profile 42.

Accordingly, the present invention allows two screens to be secured together without the need for any additional tools.

In an alternative embodiment, there may be only one lug or there may be only a single camming surface on each lug. Alternatively, there may be a plurality of camming surfaces on the or each lug. Different lug and cam arrangements may lend themselves to particular edge profiles or engagement points provided on the screens.

Further developments may incorporate the camming surfaces 32, 34, 36, 38 on the stalk portions 18, 19 of the or each lug 14, 15, or even on the top or bottom surfaces 22,24 of the lever 12 such that the cup portions 20, 21 of the lugs 14, 15 have no camming surface.

The tie 10 of the present invention may be fabricated from any material. However, it is preferably manufactured of a Nylon ® material with a fibre glass content. The tie 10 ideally may be injection moulded.

An alternative screen arrangement has the two screens requiring joining together to form a T-shape. The tie used for such a connection may only require a single lug with a camming surface. The edge profile need only be provided on the first screen, with a slot being provided in the central portion of the second screen at the line of intersection of the two screens. The lug may then be engaged through both slots.

Referring now to Figure 7, there is shown a perspective view of a partitioning system comprising first and second screens 56, 58, the two screens 56,58 having edge profiles 40, 42 and slots 44, 46 formed therein. The partitioning system further comprises an intermediate profile 60 and two ties 10. The ties 10 are shown in an unlocked orientation, with each tie 10 comprising a lever 12 extending in only one direction from its lug, not shown. The intermediate profile 60 is an approximately square crossed sectioned block. On a central part of each side of the square section there is provided a longitudinal slot 62. The slot 62 is shaped for engaging the lug of the ties 10 in much the same manner as described above. In this manner, the intermediate profile 60 allows the two screens 56, 58 to be arranged either in a straight line, or as shown, at a right angle. Clearly, the section of the intermediate profile 60 may

be made in a variety of shapes to provide for the screens 56, 58 to be arranged at different angles.

Referring now to Figure 8, there is shown a third embodiment of the second aspect of the present invention. This embodiment includes three screens, the first screen 56, a middle screen 57 and the second screen 58. The three screens 56, 57, 58 are linked using ties 10, each tie 10 comprising three levers 65, 66, 67 hingedly connected to one another with the first lever 65 and the third lever 67 hingedly connected at opposite ends of the second lever 66. Lugs, not shown, have camming surfaces, and attach the first lever 65 and the third lever 67 to slots 44, 46, 69 in the first screen 56, the second screen 58, and the middle screen 57 respectively. The first and third levers 65, 67 operate the camming surfaces of the lugs within the slots again in much the same way as described above.

It should be appreciated that by incorporating various combinations of intermediate profiles, various designs of ties according to the present invention, and screens, the screens having slots or channels provided therein, there can be provided a variety of different partitioning systems according to the present invention.

The present invention has been described above purely by way of example. Modifications in detail may be made within the scope of the invention as defined in the claims.

Claims.

1. A tie for connecting two components, the tie comprising a lever and at least one lug wherein the tie includes a camming surface.

2. A tie according to claim 1, wherein the components are furniture partitioning such as screens or panels.

3. A tie according to claim 1 or 2, wherein the camming surface is formed on a surface of the at least one lug.

4. A tie according to claim 3, wherein the camming surface is on the underside of a flange of the lug.

5. A tie according to any preceding claim, wherein the tie comprises two lugs, each lug having a camming surface.

6. A tie according to claim 5, wherein the two lugs have substantially parallel axes.

7. A tie according to claim 5 or 6, wherein the two lugs are substantially coaxial and directionally opposed.

8. A tie according to any preceding claim, wherein the lever extends in a first direction from the lug.

9. A tie according to any preceding claim, wherein the lever extends either side of the lug.

10. A tie according to any preceding claim, wherein the lug is mushroom shaped, with a flange of the lug forming a cap portion of the mushroom shaped lug.

11. A tie according to any of claims 4 to 10, wherein the underside of the flange is preferably flat, except for the camming surface.

12. A tie according to any preceding claim, wherein a flange of the lug has two camming surfaces.

13. A tie according to any preceding claim, wherein an apex of the camming surface lies orthogonal to a longitudinal axis of the lever.

14. A tie according to any preceding claim, comprising three levers hingedly connected to one another, two of the levers supporting a lug.

15. A tie according to claim 14, wherein the third lever connects the two levers supporting a lug.

16. A tie according to any preceding claim in combination with an intermediate profile having a channel in which a lug can be engaged.

17. A partitioning system comprising at least two screens, and at least one tie comprising a lever and at least one lug, the tie including a camming surface, at least one of the screens having a channel in which the lug can be engaged.

18. A partitioning system according to claim 16, wherein the tie is engageable within engagement points of the screens.

19. A partitioning system according to claim 17, wherein the channel forms one of the engagement points.

20. A partitioning system according to any of claims 16 to 18, wherein the channel has a tolerance relative to the lug engageable therein to allow the lug to move therein with the lug at a first orientation, and to not move at a second orientation.

21. A partitioning system according to any of claims 16 to 19, wherein at least one of two engagement points is formed at a lateral edge of a screen.

22. A partitioning system according to claim 20, wherein the lateral edge comprises an aluminium edge profile having an engagement point in the form of a slot for engaging with a lug.

23. A partitioning system according to any of claims 16 to 21, wherein the screens further comprise engagement points in their central portion.

24. A partitioning system according to any of claims 16 to 22, comprising an intermediate profile and at least two ties.

25. A partitioning system according to claim 24, wherein the intermediate profile has channels for accommodating lugs.

26. A partitioning system according to claim 25, wherein transverse axes of the channels lie at relative angles to one another.

27. A partitioning system according to claim 26, wherein the relative angle is a right angle.

28. A tie substantially as hereinbefore described with reference to the accompanying drawings.

29. A partitioning system substantially as hereinbefore described with reference to the accompanying drawings.

30. A tie and profile substantially as hereinbefore described with reference to the accompanying drawings.

The Patent Office

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Application No:	GB 9811163.6	**Examiner:**	Philip Silvie
Claims searched:	1-17	**Date of search:**	28 January 1999

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.Q): E2A (AGB, AGKFK, AGLB)

Int Cl (Ed.6): E04B (2/74); F16B (5/06, 5/10,12/32, 2102)

Other: Online: WPI

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
X	GB 2 263 931 A (PORTAL) see figs 3,4	1,3-7,10 at least
X	GB 1 359 480 A (O'FARRELL) see figs 1-3	1 at least
X	EP 0 663 163 A1 (ESSELTE) see figs 8a,8b	1 at least

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
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.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.