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Description

This invention relates to connected screen panels such as are used in office and other locations to sub-divide a room or area into individual work areas or the like.

Conventionally, screen panels are connected edge to edge in upright disposition by means of separate couplings located at the top and bottom of the adjacent screening panels, the couplings including screw or bolt fastening devices.

Whilst it is a simple enough operation to tighten up and loosen off the screws or bolts of the couplings located at a convenient height, it is often difficult to tighten and loosen the bolts or screws of the couplings located near the floor. The proximity of the couplings to the floor makes it very awkward to engage and turn the screw or bolt, and often necessitates the person making or loosening the coupling lying or at least kneeling on the floor.

It is known to provide connected screen panels, as described in U.S. Patent No. 3,735,794 wherein the panels are connected edge to edge by providing the edges of the panels with means which couple to a common coupling post, adjustment of which can effect coupling or uncoupling of the screen panels.

The invention seeks to provide screen panels connected edge to edge in such a fashion that the panels can be more readily secured together and released from each other.

According to the present invention there is provided upright screen panels connected together at adjacent upright edges and at upper and lower vertically spaced locations, by upright elongate tie bar means and couplings, said tie bar means being engageable, at a position above said lower location, so as to be displaceable between a locking position connecting the screen panels and an unlocking position in which screen panels are disconnected and can be moved apart, and wherein said tie bar means comprise an upright elongated tie bar at each of the adjacent panel edges and said couplings comprise locking links releasably locked to the respective tie bars at said upper and lower coupling locations of the respective screen panels.

Preferably, the links are of T-shape or cruciform shape, and the ends of the arms of the links are locked to the respective tie bars of respective screen panels, connecting three or four of said screen panels together at a location from where the panels radiate.

Preferably, each tie bar is movable between the locking and unlocking positions by being raised and lowered by a feed screw at the top of the tie bar and the or each tie bar has means preventing the bar from rotating about its axis during turning of the screw so that the tie bar can move up to clamp the ends of said links at said locking coupling.

Preferably also, the tie bars have reduced cross section regions at the locking locations and the ends of the links have slots which receive said

reduced cross section regions and when the tie bars are raised by the feed screws the links are clamped to fixed guide members in which the tie bars are located.

The tie bars preferably comprise interconnected and axially relatively adjustable parts so that the relative positions of the reduced section regions one to another along the length of the tie bar can be adjusted.

An embodiment of the invention will now be described, by way of example only, with reference to the accompanying drawings, wherein:—

Figure 1 is a side view of a panel connectible to another panel of the same type, according to the invention;

Figure 2 is a plan view of a plurality of screening panels connected together by means according to the invention to form a screening assembly;

Figure 3 is an exploded perspective view of the edge the screen panel of Figure 1;

Figure 4 is a side view of a tie bar similar to that of Figure 3, but with modifications;

Figure 5 is a view similar to Figure 4, but shows an alternative form of the bar.

Figure 6 shows a variation to the top of the tie bars of Figures 3, 4 and 5;

Figure 7 is a plan view of a link for use in conjunction with the tie bars of Figures 3 to 6;

Figure 8 is an end elevation of the links in Figure 7; and

Figures 9 and 10 are views similar to Figures 7 and 8 and showing an alternative form of link.

Referring to the drawings, and firstly to Figure 2, a plurality of screen panels 2, 4, 6 and 8—panel 2 being shown in full lines in Figures 1 and 2 and the latter three being shown in phantom line—are shown connected together to form a screening assembly. As will be seen in Figure 2, the screen panels are interconnected by a means including links 10—shown in phantom line—each of which consists of four limbs 10A, 10B, 10C and 10D, and is held in position relative to the screen panels so as to secure said screen panels together by tie bars of respective panels, one of which tie bars is indicated by reference numeral 20.

Each panel at each upright edge has a tie bar housed therein, and therefore only a single tie bar will be described in detail, with reference to Figures 3 and 4.

Tie bar 20 is movable vertically in longitudinally spaced housings or saddles—one is indicated by reference numeral 40—which are secured to the edge 2A of the panel 2 by screws, two of which are indicated by reference numerals 40 AX and 40 BX in Fig. 2 which pass through holes 40A and 40B in flange 2 AX forming part of the saddle 40.

An end or edging cap 2B of the screen panel 2—and similarly end or edging caps 4B, 6B and 8B of the screen panels 4, 6 and 8—conceal the tie bars, the end or edging caps having slots 2C and 2D (Figure 2) therein through which the limbs of the links pass as will be more fully explained.

An alternative form of linkage means—shown in phantom line and indicated by reference

numeral 70—is shown in Figure 1, and its purpose will be indicated hereinafter.

As shown in Figures 3 and 4, the housing or saddle 40 is shown spaced longitudinally of a second housing or saddle 50 which is also secured to the end 2A of the screening panel 2 by means of screws which pass through holes 50A and 50B. As will be seen—and perhaps better seen in Figure 1—the saddle 40 includes a channel portion 42, whose front face (in the drawing) is open as indicated by reference numeral 44. Similarly, housing or saddle 50 has a channel portion and the front face thereof has an open portion 54.

Engageable in the housings or saddles 40 and 50, extending therebetween and movable longitudinally relative to and within the housings or saddles 40 and 50 is the tie bar 20, the tie bar being so movable by means of an Allen head or other screw or bolt 56 engaging in a threaded bore 58 in the tie bar through the intermediary of a washer 60. It will be appreciated that as the screw or bolt 56 is threaded into the threaded bore 58, if the screw is turned in the appropriate direction, the presence of the washer 60 (in engagement with the top of saddle 40) will prevent downward movement of the screw or bolt 56 with the result that the tie bar 20 will be drawn upwardly relative to the housings or saddles as indicated by arrow 62 in Figures 3 and 4.

An alternative form of the tie bar is shown in Figure 5, where the tie bar has a threaded stud 64 engageable by a threaded nut 66, having a flange 67.

The tie bar 20 has two longitudinally spaced recessed or waisted portions 22 and 24 which include portions 26 and 28 respectively of reduced cross-sectional dimensions compared with the remainder of the tie bar. Each portion 26 and 28 (in the Figure 4 embodiment) connects with the portions of the tie bar immediately below by means of chamfers 30 (not shown in Fig. 3) and 32 whose included angle is preferably 90° and whose purpose will become apparent later.

Referring to Figure 6, in the arrangement shown the tie bar 100 is threaded at the top and bottom ends 102 and 104, and a block 106 is attached to the lower end 104 by means of a lock nut 108, or in the alternative by welding, whilst the block 110 threaded to the top end is turnable on the top and 102 provided it is displaced out of the housing 112 as shown in Figure 6. The block 110 is of square cross section so that when it fits in the housing 112, it cannot rotate relative to the rod portion of the bar.

Above block 110 is the screw block 114 and the recessed portion 116 is provided for receiving the links as described herein. The tapered shoulder 118 is also present.

At the bottom end, under block 106 is a further block 120 connected by the recessed portion 122 to block 106 and a tapered shoulder 124, similar to the tie bar illustrated in Figure 4 is provided at the top of the block 120. Block 120 slides in a housing 126, and a pin 128 fast with the block 120 locates

in a slot 130 in housing 126 to prevent the tie bar from being completely extracted in the two housings 112 and 126. In Figure 6, the tie bar is shown in the raised position to enable relative adjustment of the block 110 relative to the rod 100, which has the effect of altering the distance between the recessed portions 116 and 122. By this means, the spacing between the recessed portions, which receive the respective links, can be finally adjusted. After completing the adjustment, the tie bar is lowered until the block 110 reaches the dotted line position as shown, under the housing 112, and the block 114, which is also of square cross section, therefore prevented from rotating. Raising of the tie bar is affected by means of the screw 132 in the manner herein described.

Referring now to Figs. 7 and 8, these Figures show in more detail the links 10, which are of cruciform shape. The four limbs 10A, 10B, 10C and 10D are each slotted at their outer extremities, the slots being indicated by reference numerals 12A, 12B, 12C and 12D respectively. At the inboard end of each of the slots, the limbs are countersunk as shown at 14A, 14B, 14C and 14D, the included angle of each countersink corresponding to that of the chamfers 30 and 32 of the tie bar 20.

The link 70 of Figs. 9 and 10 comprises an elongate member whose opposing ends are provided with open slots 72 and 74 whose inboard ends are countersunk at 76 and 78 respectively, the included angle of these countersinks again corresponding to that of the chamfers 30 and 32 of the tie bar 20. The links 70 are for connecting two screen panels, whereas the links 10 are for connecting four screen panels. It is possible to use T-shaped links for connecting three screen panels together.

In use, and referring back to Figs. 2 and 3, the screen panels 2, 4, 6 and 8 are arranged in the desired relationship—as shown for example in Fig. 2—with each screen panel carrying two housings or saddles 40 and 50 and associated tie bar 20. The screen panels will carry their end or edging caps 2B, 4B, 6B and 8B respectively having the slots (such as has been described), the limbs 10A, 10B, 10C and 10D of the linkage means 10 projecting through these slots, the slots 12A, 12B, 12C and 12D being positioned such that they engage the recessed or waisted portions 22 and 24 of the tie bars 20. It will of course be appreciated that in the arrangement shown in Fig. 2, there will be four tie bars, and that there will be two vertically spaced links.

With the components parts in the above-described positions (shown in Fig. 2), screws or bolts 56 are applied to the upper ends of the tie bar 20, the washers 60 being interposed therebetween. Turning of the screws or bolts 56 causes the tie bars, due to the engagement of the washers 60 against the upper ends of the housings or saddles 40, to draw the tie bars 20 upwardly relative to the housings or saddles 40 and 50. Such movement of the tie bars causes the

chamfered portions 30 and 32 thereof to mate with the countersunk portions 14A, 14B, 14C, 14D. The linkages move upwardly to bring the links into engagement with the lower extremities of the housings or saddles 40 and 50 and the links become locked to the tie bars and hence to the screen panels. Thus, the links become locked to the tie bars and to the housings or saddles 40 and 50, so as to secure the screen panels 2, 4, 6, 8 together and render them inseparable.

Corner covers—one is indicated by reference numeral 2E indicated in Fig. 1—may then be applied to the panels so as to conceal the screws or bolts, the housings or saddles and associated components.

If only three screening panels are to be secured together, then the links 10 may be formed with only three limbs, and if only two screening panels are to be connected together links 70 may be used in place of the links 10. Where only two screening panels are to be connected, they may of course be disposed at any desired relative angle before tightening up the screws or bolts 56.

It will be appreciated that more than four screen panels may be secured together by means in accordance with the invention, in which cases the links will be formed with limbs corresponding in number to the number of screen panels to be connected.

With means according to the invention, it is relatively simple and quick to secure a number of screen panels together to form a screening assembly—and to release said screen panels—since access is required only at the upper ends of the screening panels yet at the same time the connections are located at two locations in the heights of the screen panels so as to give rigidity to the finished screening assembly.

Many modifications of the invention may be made, and it is not necessary that the manipulation of the tie bars to effect the clamping and unclamping be by means of screw threading. Thus, a crank lever could be used for manipulating the tie bars between the locked and unlocked positions, and additionally, in moving between said locked and unlocked positions, the tie bars may be rotated as opposed to being moved axially, a novel feature of the invention residing in that the tie bar clamps at several spaced locations one of which is towards the bottom of the coupled edges of the screen panels.

Claims

1. Upright screen panels (2, 4, 6, 8) connected together at adjacent upright edges and at upper and lower vertically spaced locations, by upright elongate tie bar means (20) and couplings (10, 70), said tie bar means (20) being engageable, at a position above said lower location, so as to be displaceable between a locking position connecting the screen panels (2, 4, 6, 8) and an unlocking position in which screen panels (2, 4, 6, 8) are disconnected and can be moved apart, and wherein said tie bar means (20) comprise an

upright elongated tie bar (20) at each of the adjacent panel edges and said couplings comprise locking links (10, 70) releasably locked to the respective tie bars (20) at said upper and lower couplings locations of the respective screen panels (2, 4, 6, 8).

2. Screen panels according to Claim 1, characterised in that the links (10, 70) are of T-shape or cruciform shape, and the ends of the arms (10A, 10B, 10C, 10D) of the links are locked to the respective tie bars (20) of respective screen panels (2, 4, 6, 8), connecting three or four of said screen panels (2, 4, 6, 8) together so that they radiate from said links (10, 70).

3. Screen panels according to Claim 1 or 2, characterised in that each tie bar (20) is movable between the locking and unlocking positions by being raised and lowered by a feed screw (56, 66) at the top of the tie bar (20) and the or each tie bar (20) has means (44, 114) preventing the bar (20) from rotating about its axis during turning of the screw (56, 66) so that the tie bar (20) can move up and clamp the ends of said links (10, 70) at said upper and lower coupling locations simultaneously.

4. Screen panels according to Claim 3, characterised in that the tie bars (20) have reduced cross section regions (22, 24, 116, 122) at the locking locations and the ends of the links (10, 70) have slots (12A, 12B, 12C, 12D, 72, 74) which receive said reduced cross section regions (22, 24, 116, 122) and when the tie bars (20) are raised by the feed screws (56, 66) the links (10, 70) are clamped to fixed guide members (40, 50) in which the tie bars (20) are located.

5. Screen panels according to Claim 4, characterised in that the tie bars (20) comprise interconnected and axially relatively adjustable parts (110, 106) so that the relative positions of the reduced section regions (116, 122) one to another along the length of each tie bar can be adjusted.

Patentansprüche

1. Aufrechtstehende Abschirmpaneele (2, 4, 6, 8), welche an benachbarten aufrechtstehenden Rändern und an oberen und unteren vertikal räumlich voneinander getrennten Orten miteinander verbunden sind, durch aufrechte langgestreckte Verbindungsschienen (20) und Kupplungen (10, 70), wobei die Verbindungsschienen (20) an einer Stelle über der unteren Position miteinander in Eingriff bringbar sind, um so zwischen einer Befestigungsposition, in welcher die Abschirmpaneele (2, 4, 6, 8) verbunden sind, und einer Nicht-Befestigungsposition, in welcher die Abschirmpaneele (2, 4, 6, 8) nicht verbunden sind und voneinander wegbewegt werden können, versetzbar sind, und wobei die Verbindungsschienen (20) eine aufrechte langgestreckte Verbindungsschiene (20) an jedem der benachbarten Paneelenrändern aufweisen und die Kupplungen Befestigungsverbindungen (10, 70) aufweisen, welche lösbar mit den entsprechenden Verbindungsschienen (20) an der oberen und unteren

Kupplungsposition der entsprechenden Abschirmpaneelen (2, 4, 6, 8) verbunden sind.

2. Abschirmpaneele nach Anspruch 1, dadurch gekennzeichnet, daß die Verbindungen (10, 70) eine T-Form oder eine Kreuzform haben und die Enden der Arme (10A, 10B, 10C, 10D) der Verbindungen mit den entsprechenden Verbindungsschienen (20) der entsprechenden Abschirmpaneelen (2, 4, 6, 8) befestigt sind, um drei oder vier der Abschirmpaneele (2, 4, 6, 8) miteinander zu verbinden, so daß sie von den Verbindungen (10, 70) strahlförmig ausgehen.

3. Abschirmpaneele nach Anspruch 1 oder 2, dadurch gekennzeichnet, daß jede Verbindungsschiene (20) zwischen der Befestigungs- und der Nicht-Befestigungsposition bewegbar ist, durch Anheben und Absenken mittels einer Stellschraube (56, 66) am oberen Ende der Befestigungsschiene (20), und die oder jede Befestigungsschiene (20) eine Vorrichtung (44, 114) hat, welche die Schiene (20) daran hindert, sich um ihre Achse zu drehen, während die Schraube (56, 66) gedreht wird, so daß sich die Befestigungsschiene (20) aufwärts bewegen kann und die Enden der Verbindungen (10, 70) an den oberen und unteren Kupplungspositionen gleichzeitig klemmt.

4. Abschirmpaneele nach Anspruch 3, dadurch gekennzeichnet, daß die Befestigungsschienen (20) verringerte Querschnittsbereiche (22, 24, 116, 122) an den Befestigungspositionen haben, und die Enden der Verbindungen (10, 70) Schlitz (12A, 12B, 12C, 12D, 72, 74) haben, welche die verringerten Querschnittsbereiche (22, 24, 116, 122) aufnehmen, und wenn die Befestigungsschienen (20) durch die Stellschrauben (56, 66) angehoben werden, die Verbindungen (10, 70) mit festen Führungselementen (40, 50), in denen die Befestigungsschienen (20) angeordnet sind, geklemmt werden.

5. Abschirmpaneele nach Anspruch 4, dadurch gekennzeichnet, daß die Befestigungsschienen (20) miteinander verbundene und axial relativ justierbare Teile (110, 106) aufweisen, so daß die relative Positionen der reduzierten Querschnittsbereiche (116, 122) zueinander längs der Länge jeder Befestigungsschiene justiert werden können.

Revendications

1. Panneaux-écrans verticaux (2, 4, 6, 8) reliés ensemble aux bords verticaux adjacents et en des emplacements supérieurs et inférieurs verticalement espacés, par des moyens formant tirants verticaux allongés (20) et des couplages (10, 70), lesdits moyens formant tirants (20) pouvant être

engagés, en une position au-dessus dudit emplacement inférieur, de façon à pouvoir être déplacés entre une position de verrouillage reliant les panneaux-écrans (2, 4, 6, 8) et une position de déverrouillage dans laquelle les panneaux-écrans (2, 4, 6, 8) sont déconnectés et peuvent être retirés, lesdits moyens formant tirants (20) comprenant un tirant allongé vertical (20) à chacun des bords de panneau adjacents et lesdits couplages comprenant des pièces de liaison (10, 70) de verrouillage verrouillées de façon amovible aux tirants respectifs (20) auxdits emplacements de couplage supérieurs et inférieurs des panneaux-écrans respectifs (2, 4, 6, 8).

2. Panneaux-écrans selon la revendication 1, caractérisé en ce que les pièces de liaison (10, 70) présentent une forme de T ou de croix, et les extrémités des bras (10A, 10B, 10C, 10D) des pièces de liaison sont verrouillées aux tirants respectifs (20) des panneaux-écrans respectifs (2, 4, 6, 8), reliant trois ou quatre desdits panneaux-écrans (2, 4, 6, 8) ensemble de sorte qu'ils rayonnent à partir desdites pièces de liaison (10, 70).

3. Panneaux-écrans selon la revendication 1 ou 2, caractérisé en ce que chaque tirant (20) est mobile entre les positions de verrouillage et de déverrouillage en étant relevé et abaissé par une vis d'entraînement (56, 66) à l'extrémité supérieure du tirant (20), et le ou chaque tirant (20) présente des moyens (44, 114) empêchant le tirant (20) de tourner autour de son axe pendant que tourne la vis (56, 66), de sorte que le tirant (20) peut se déplacer et serrer les extrémités desdites pièces de liaison (10, 70) auxdits emplacements de couplage supérieurs et inférieurs, simultanément.

4. Panneaux-écrans selon la revendication 3, caractérisé en ce que les tirants (20) présentent des zones de section transversale réduite (22, 24, 116, 122) aux emplacements de verrouillage et les extrémités des pièces de liaison (10, 70) présentent des fentes (12A, 12B, 12C, 12D, 72, 74) qui reçoivent lesdites zones de section transversale réduite (22, 24, 116, 122), et quand les tirants (20) sont relevés par les vis d'entraînement (56, 66), les pièces de liaison (10, 70) sont serrées aux organes de guidage fixes (40, 50) dans lesquels sont situés les tirants (20).

5. Panneaux-écrans selon la revendication 4, caractérisé en ce que les tirants (20) comprennent des parties (110, 106) interconnectées et réglables axialement l'une par rapport à l'autre de sorte que les positions relatives des zones de section réduite (116, 122) l'une par rapport à l'autre le long de la longueur de chaque tirant peuvent être réglées.









