

Connector System and Components Therefor

Field of the Invention

The present invention relates to a connector system and components for the connector system. Principally, it is directed towards the connectors used to connect two or more bodies.

Background of the invention

Present connector systems comes in all shapes, sizes and materials. For instance, such systems can be used in anything from toys for young children through to scaffolding for buildings and beyond. An example of such a system for children is one based around hollow straws. The straws can fit through annular bodies, which have varying number of protrusions extending from them. These allow further straws to be attached orthogonally to the one passing through the body. Other systems, such as scaffolding put sleeves at the end of the scaffolding bars, which allow a further bar to be joined as an extension of the first bar. Other bars can be attached at right angles by clamping them at required positions long at the length of the bar.

One problem with known connector systems is that they are not generally flexible in the arrangements permitted. For instance, in the case of straw connectors, one is limited to the specific number of fixed protrusions provided on the pieces. Likewise there is a limited variety of what of possible with scaffolding. Additionally, even if there is flexibility, each different connection requires a different dedicated component. The more specialised each component becomes, the more different components people need, the less any one of them is necessarily required, and the more certain of them may cost.

Aim of the Invention

The aim of the present invention is to provide a new connector system. Preferably, the new system will at least to partially alleviate some of the problems with known systems

or components therefor. Ideally the present invention should provide a new and inventive connector system and parts therefor which allow flexibility in the connection arrangements provided. Preferably, greater flexibility can also be achieved with fewer different parts.

Summary of the Invention

According to one aspect of the present invention there is provided connector means for use in a connector system, comprising:

- a connector body; and
- first and second anchor means: wherein
- said connector body has a hollow portion therethrough;
- said first anchor means can be inserted into said hollow portion from a first end thereof;
- said second anchor means can be inserted into said hollow portion from a second end thereof; and
- said first and second anchor means each comprise an anchor body having fixing means on one end thereof to fix themselves to each other and, thereby, to be secured within said connector body.

Preferably, the fixing means of at least the first anchor means comprises a male portion and the fixing means of at least the second anchor means comprises a female portion into which said male portion can fit. Between them, these ideally define a snap latch.

In one possibility, the male portion comprises at least one detent means, the or each detent means having a cam surface at its front, a recessed detent surface to the rear of said cam surface and a flexible connecting arm, connected to the anchor body of the anchor means. The female portion may comprise at least one detent receiving means, the or each detent receiving means having a cam contact surface and a recessed holding surface to the rear of said cam contact surface. Between them then the male and female portions are constructed such that to fix the first anchor means to the second anchor means, the two anchor means are directed, relatively, towards each other, a cam surface of said first anchor means contacts the cam contact surface said second anchor

means, the connecting arm flexes, the cam surface passes beyond the cam contact surface and the connecting arm unflexes at least partially, leaving the detent surface within the recess beyond the holding surface.

The male portion may include two of said detent means and said female portion two of said detent receiving means.

It is also preferred that the fixing means of both said first and second anchor means comprise a male portion and a female portion and the fixing means of said first and second anchor means may be substantially the same.

The first and second anchor means may be constructed such that to fix the first anchor means to the second anchor means, the fixing means of said first anchor means are orientated at a position 180° relative to the fixing means of the second anchor means.

Said connector body may preferably further comprise securing means within said hollow portion, to prevent the first and second anchor means being removed from said hollow portion whilst fixed together within said connector body. Such securing means may be constructed to prevent substantial movement between the connector body and said first and second anchor means, whilst said anchor means are fixed together within said connector body. It may comprise at least one protruding portion protruding into said hollow portion from the wall of said hollow portion, for instance an endless ridge running around the wall of the hollow portion. Said securing means should also be centrally located within said hollow portion.

The connector means may further comprise access means in said connector body to allow external access to the fixing means of at least one of said anchor means when said anchor means are fixed together within said connector body.

Most usefully at least one of the anchor means may further comprise attachment means for attaching said anchor means to at least one interconnection component of said system. These attachment means may be provided on an end of the anchor means body

opposing that having the fixing means thereon. As an example, the attachment means comprise one or more projections for fitting inside interconnection components of said system.

The connector body may preferably be substantially parallelepipedal with any attachment means extending therefrom and said hollow portion extending between two opposing faces of the parallelepiped. Any attachment means could be provided on at least two different faces of the parallelepiped.

According to another aspect of the present invention there is provided a connector system comprising:

- a plurality of connector means, each as defined above claims, independently of each other; and

- one or more interconnection components for linking two or more of said connector means together.

According to one further aspect, there is provided a connector comprising a connector body and first and second anchor means fixed together in a hollow portion passing through the connector body, the anchor means each have an anchor body having fixing means on one end thereof fixing the two anchor means to each other and, thereby, secure them within the connector body.

Brief introduction to the drawings

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

Figures 1a to 1f show various examples of connector bodies;

Figure 2 shows a cross section through the connector body of Figure 1a;

Figures 3a to 3f show various examples of anchor means and attachments therefor;

Figures 4a to 4c show in more detail the anchor means of Figure 3b;

Figures 5a and 5b shows examples of two anchor means fixed together;

Figure 6 shows an example of a connector body with anchor means connected therein;

Figures 7a to 7c show various combinations of connectors of the invention, not yet assembled;

Figures 8a to 8c show the same combinations as Figures 7a to 7c, respectively, assembled; and

Figures 9a and 9b show examples of a connector system connected together.

Specific Description

Various embodiments of the components of the present invention will now be described in detail. They are all of the same basic design and are intended to be used together in one system.

The basic component of the system of the present invention is a connector body 102, 104, 106, 108, 110, 112. Various examples of connector body are shown in Figures 1a to 1f. In each case of this embodiment of system, the connector body 102, 104, 106, 108, 110, 112 is substantially cuboidal with a hollow portion 120 in the form of a square hole passing therethrough from one face to an opposing face, through the central axis. Additionally, in each of the embodiments of Figures 1a to 1e, there are attachment means in the form of protrusions 122 extending from the cuboidal part 124 of the

connector body 102, 104, 106, 108, 110, 112. As can be seen in Figures 1a to 1f, there preferably between zero and four such protrusions 122 per connector body 102, 104, 106, 108, 110, 112, each one protruding orthogonally from a separate one of the four faces through which the hollow portion 120 does not pass.

The protrusions 122 are square in cross-section and intended to fit within the ends of interconnections components, such as rods 126 (see Figures 9a and 9b), to allow a frame, or whatever else is being built, to be made up. The protrusions 122 shown are substantially square in cross-section. They are made up of ridges 128 in a saw-tooth shape, appearing as a series of pyramid bases piled one upon the other, with each base extending only a short distance before another one is provided one on top of it. The top-most base extends much further than those below it. This arrangement provides a friction fit within the end of an interconnection component fitted on to it.

Figure 2 shows the connector body 102 of Figure 1a in cross-section. Although this is the cross-section of Figure 1a, it would equally apply to Figures 1b and 1c. Within the hollow portion 120, in the centre, is a securing means 130 protruding from the hollow portion wall into the hollow portion 120. This is in the form of an endless ridge 130, which runs around the surface of the hollow portion 120.

The other important components of the present invention are the anchor means 140, 142, 144, 146, 148, for example shown in Figure 3a to 3e. Each exemplary anchor means 140, 142, 144, 146, 148 comprises a body 150 having fixing means 152 on end side thereof, with either an attachment means 154 or blank face 156 on the other end thereof. The body 150 is substantially square in cross-section to allow it to be inserted within the hollow portion 120 of a connector body 102, 104, 106, 108, 110, 112, with the fixing means 152 entering the connector body 102, 104, 106, 108, 110, 112 first. The connector body 102, 104, 106, 108, 110, 112 and anchor means 140, 142, 144, 146, 148 are constructed such that one anchor means 140, 142, 144, 146, 148 can be inserted into the connector body 102, 104, 106, 108, 110, 112 from each end of the hollow portion 120. The securing means 130 in the hollow portion 120 prevents an anchor means 140, 142, 144, 146, 148 passing all the way through from one side to the other.

In the embodiments of the anchor means 142, 144, 146, 148 of Figures 3b to 3d, each anchor means 142, 144, 146, 148 has attachment means 154 in the form of one or more protrusions 122 protruding from its body 150 from the opposing end to that having the fixing means 152 on it. Figure 3b shows a single such attaching means 122 protruding straight from the anchor means body 150. Figure 3c shows a single protrusion protruding at an angle, for instance 45° from the body 150. Figure 3d shows the two such protrusions 122 protruding at angles to the body 150, for instance, each at 45° to the body 150 and at 90° to each other. In the case of Figure 3e, the attachment means 154 is in the form of a socket 156 on the other end of the anchor body 150 from the fixing means 152. A pivotable attachment 158 as shown in Figure 3f has a pivot portion which fits into this socket 156. This allows the protrusion at the other end of the pivotable attachment 158 to pivot relatively to the anchor means 148.

Figure 3a shows an anchor means 140 with nothing extending from the opposing end of its body 150 from the fixing means 152. When such an anchor means 140 is inserted into the hollow portion 120 of a connector body 102, 104, 106, 108, 110, 112, it provides a flat blank face 156.

Figures 4a and 4b show side views of the anchor means 142 of Figure 3b. Figure 4c shows an end view looking at the fixing means 152. The fixing means 152 in each of the embodiments shown in Figures 3a to 3e is the same.

The fixing means 152 of each anchor means 140, 142, 144, 146, 148 includes a male portion 160 and a female portion 162. The male portion 160 is made up of two detent means 164. These are both latches, having an outwardly facing cam surface 166 with a forward and sideways extent. To the rear of the cam surface 166 is a recessed detent surface 168. This is then connected to the anchor means body 150 by a flexible connecting arm 170. Each detent means 164 is narrow at its very front and at the beginning of the cam surface 166. It then extends outwards with the cam surface 166, to the end of the cam surface 166. There is a short portion of a rearwardly extending flat surface leading to a recess, whose rearwardly facing front surface is formed by the detent surface 168. The two detent means 164 are mirror images of each other.

On the other hand, the female portion 162 of each fixing means 152 comprise a recess 172 in the end of the anchor body 150. The recess 172 is roughly 'T' shaped (looking at the side of the anchor body), with the top of the 'T' extending in the widthwise direction of the anchor body 150, across it's entire width. The base of the 'T' is narrower than the widest extent of the two detent means 164 but no narrower than the distance separating the ends of the two cam surfaces 166 of the detent means 164. The front outside edges of the base of the 'T' are cam contact surfaces 174. The thickness of the top of the 'T' is no less than the distance between the front end of the detent means 164 and its detent surface 166. The surfaces forming the underside of the top of the 'T' are detent holding surfaces 176.

In use, the fixing means 152 of two anchor means 140, 142, 144, 146, 148 are directed towards each other. They are at 180° relative to each other, so that the male portion 160 of each is directed towards the female portion 162 of the other.

When the two detent means 164 of one anchor means 140, 142, 144, 146, 148 come into contact with the female portion 162 of an anchor means 140, 142, 144, 146, 148, the cam surfaces 166 at the front of the detent means 164 contact cam contact surfaces 174 at the front of the female portion 162. Further pushing of the two anchor means 140, 142, 144, 146, 148 relatively towards each other forces the two cam surfaces 166 to move sideways, towards each other, thus allowing the two anchor means 140, 142, 144, 146, 148 to move closer together. With sufficient force, the cam surfaces 166 will have moved sufficiently together to allow the two detent means 164 to slide beyond the cam contact surfaces 174 until the outside edges of the cam surfaces 166 come pass the inside edges of the detent holding surfaces 176. These define the beginning of the recess 172. At that point, the inherent flexibility of the connecting arms 170 pushes the detent means 164 outwards into the recesses 172. Once this has happened, it will no longer be possible to pull the two anchor means 140, 142, 144, 146, 148 directly apart, as this will simply have the detent surfaces 168 pushing against the holding surfaces 176. In this manner the two anchor means 140, 142, 144, 146, 148 are fixed together.

The length of the arms 170 and the 'T' in the female portion 162 are such that the two female portions 162 of anchor means 140, 142, 144, 146, 148 fixed together do not contact each other. This effectively leaves a groove at the centre, between the two anchor means 140, 142, 144, 146, 148, corresponding to the securing means ridge 130.

As the fixing means 152 on each anchor means 140, 142, 144, 146, 148 is the same, it does not matter if the two anchor means 140, 142, 144, 146, 148 fixed together are the same or different, thus. For example, any one of the anchor means 140, 142, 144, 146, 148 of Figures 3a to 3e could fit with one identical to itself or any other one of the anchor means 140, 142, 144, 146, 148 of Figures 3a to 3e. Examples are shown in Figures 5a and 5b. In Figure 5a, two anchor means 142 of Figure 3b are fixed together. In Figure 5b the anchor means 140 of Figure 3a is fixed to the anchor means 142 of Figure 3b. Of course many other combinations are possible.

The outermost extent of the detent means 164 is not as great as that of the anchor means body 150. This is to allow the detent means 164 to pass through the securing means ridge 130 inside the connector body 102, 104, 106, 108, 110, 112. On the other hand, this would not be necessary where the securing means did not protrude into the hollow portion or did not protrude therein the whole way round the inside of the hollow portion.

Figure 6 shows, in cross-section, a combination of the components of Figures 1c, 3a, 3e and 3f fixed together. As can be seen, the anchor means 140 of Figure 3a is fixed to anchor means 148 of Figure 3e, so that they cannot separate. Additionally, the securing means 130 prevents either anchor means 140, 148 being pulled out, as that will require one of the anchor means bodies to get past the securing means ridge 130, where the ridge 130 makes the hollow portion 120 narrower than the anchor body 150 at that point. Thus in the described embodiments two anchor means 140, 142, 144, 146, 148 are fixed to each and thereby secure themselves within the connector body 102, 104, 106, 108, 110, 112 without, necessarily, being affixed to it themselves.

With the specific embodiment described, it is envisaged that, once the connector means has been made up, it could not be dismantled. This would be prevented by the

construction of the anchor means 140, 142, 144, 146, 148. Additional strength can be obtained by putting glue into the hollow portion 120 between the two anchor means 140, 142, 144, 146, 148.

Figures 7a to 7c show various combinations of connector bodies and anchor means, not yet assembled. Figure 7a shows two-protrusion connector body 108 and two blank anchor means 140. Figure 7b shows three-protrusion connector body 104, one blank anchor means 140 and one single protrusion anchor means 142. Figure 7c shows four-protrusion connector body 102 and two single protrusion anchor means 142. Figures 8a to 8c show the same combinations as Figures 7a to 7c respectively, assembled.

Figure 9a and 9b shows the connector system in use. Each Figure has several assembled connector means interconnected by rods 126. In the case of Figure 9a, there are three assembled connector means connected by rods 126 of different length. This shows one of the advantages of this system. Using the pivotable attachment 158, a triangular frame can be made which other systems might not allow. Almost any form of triangle can be made (although with the embodiments shown no angle could be less than about 10° or more than about 170°. Likewise a huge variety of other polygons is also possible.

In the case of Figure 9b, there are four assembled connector means with three connecting rods 126 of the same length.

In Figure 9a, the assembled connector means at the two ends of the hypotenuse are the same (in at least the plane of the triangle). Each comprises a connector body 110 as shown in Figure 1e, an anchor means 140 shown in Figure 3a, an anchor means 148 as shown in Figure 3e and a pivotable attachment 158 as shown in Figure 3f. In Figure 9b, each assembled connector means is made up of a connector body 106 as shown in Figure 1c, an anchor means 140 as shown in Figure 3a and an anchor means 146 as shown in Figure 3d. However, to vary these arrangements, the user does not need to purchase complete new connectors. Instead, he can just obtain a specific new anchor means 140, 142, 144, 146, 148 or connector body 102, 104, 106, 108, 110, 112. Thus more desired arrangements can be built with fewer components than in other systems.

Although between zero and four protrusions have been described in the embodiments so far, it is possible to have even more or different arrangements of protrusions 122 by having them protruding at other angles relative to the hollow portion 120 and/or each other and/or have more than one on any face. Additionally, the protrusions 122 could pivot or rotate on their faces. Other forms of attachment means, for instance involving recesses instead of protrusions can be used instead.

It is not essential that the connector body be basically cuboidal; it could be some other parallelepiped or cylindrical, spherical, ovoidal or some other shape. However, the more symmetrical the more useful. Thus the cuboid or sphere as a basic shape would be preferred, with the cuboid being the preferred of those two.

In the present embodiments, the hollow portion 120 passes through the main axis of the connector body 102, 104, 106, 108, 110, 112. Again this is not essential, but is preferred. It is rectangular in cross-section but need not be. Independently of the external shape of the connector body, it could be round, rectangular, elliptical or any other shape. Preferably, however, it has at least one degree of rotational symmetry (where a square has four such degrees and a circle an infinite number).

It will be noted that, if the hollow portion is round then it will be difficult to align two fixing means to be positioned exactly 180° relatively to each other. To overcome this problem, a ridge or recess may be provided along the length of the hollow portion, or at least at each end of the hollow portion. Corresponding recesses or ridges would be provided along two opposing sides of the bodies of the anchor means to allow correct orientation.

In the embodiments so far, the hollow portion has been a through hole, passing from one side of the connector body to the other. The invention does not always require that the hollow portion be a hole enclosed around its periphery. It could be open on one or more sides along part or all of its length. As long as two anchor pieces can be fitted in and thereby hold each other in place. Moreover, the hollow portion does not need to go straight through from one side to the other. It could be angled, for instance at 90° , with the design of anchor portions adapted accordingly.

Although the protrusions shown are square in cross-section, they need not be. For example, they could be round, triangular, rectangular, elliptical or any of a number of other shapes. Additionally, they do not need to use the friction fitting as shown or even friction fitting at all to stay within the ends of the interconnection components. There are any number of approaches the skilled person might take, for instance providing a detent on a spring inside the protrusion, with a hole in the side of the protrusion allowing the end of the detent to pass therethrough to latch onto a surface in an interconnection component. As another possibility, the interconnection components do not need to fit around the attachment means but could fit within them.

As with the attachment means 122 for the connector bodies, there are numerous other types of attachment means and combinations available for the outer faces of the anchor means. However, the attachment means 122, 154 and the range of options would generally be the same

The securing means ridge 130 as shown is endless (continuous) but could still work with gaps in it. This even could be replaced with one or more individual protrusions 122 at regular or irregular positions. It may even be possible for the securing means to be or include one or more recesses in the wall of the hollow portion 120. The securing means 130 is shown as being central within the hollow portion 120. It is not essential that it is central within the connector body but it is preferable, to allow ease of use from either side, although this could be achieved through having two sets of securing means within the hollow portion, one for each anchor means.

The body 150 of the each anchor means 140, 142, 144, 146, 148 is the same shape as the hollow portion 120 to allow it to fit closely therein. Thus when the hollow portion 120 is square then so should the anchor bodies be. Likewise if the hollow portion were rectangular, circular, etc., the anchor bodies should also be rectangular, circular, etc., respectively. The shapes do not have to match, just as long as the anchor bodies can fit into the hollow portion, preferably with little if any sidewise movement allowed.

The preferred embodiments have two anchor means only. It is possible for a single connector body to have more, for instance allowing three, four, five, six or more (although space for four or six orthogonal ones would be preferred). In each case, even if there is space for more than two, any embodiment would preferably still work with at least two anchor means.

In the embodiments of the anchor means 140, 142, 144, 146, 148 shown, the male portion 160 of the fixing means 152 is shown having two detent means 164 directed outwards. They could be directed inwards. There could be just one such detent means. The detent means could be rigid, rather than connected by a flexible arm 170, with the flexibility in an appropriate portion of a female portion. Other fixing systems could use two detents latching together, rather than a male portion latching into a female portion. Other fixing mechanisms, for example a screw thread might also be a possibility.

The Figures show each anchor means 140, 142, 144, 146, 148 as having both male and female portions 160, 162. While this is preferred, as it means that any one anchor means can fit with any other anchor means, it is not essential for some aspects of the invention. Some anchor means could be made to have only male portions 160 and some to have only female portions 162.

The exemplified embodiments have the fixing means 152 symmetric about a line across one particular width of the anchor means body 150. It is possible to arrange the fixing means to have other lines of mirror symmetry or axes of rotational symmetry.

In the specific embodiments described so far, the securing means 130 protrude into the hollow portion 120 of the connector body 102, 104, 106, 108, 110, 112. A further embodiment provides the anchor means with detents but cause them to protrude outwards when two are fixed together. In an embodiment where the connector body is provided with recesses within the holes of the hollow portion, these outwardly extending detents fit in to the recesses to prevent the anchor means being pulled out from the connector body. In such an embodiment, it is possible to fit the anchor means in from the same side (one after the other).

Whilst in the above embodiments, a connector once made up cannot be unmade, it may be desirable to be able to make up and unmake connectors on a regular basis, for instance where the present invention is used as a toy. Thus, in yet another embodiment, the connector body is provided with small holes so that a pin or other body can be inserted to release the detents of the detent means 164. For example two hairpins or the like could be used, one for each pair of detents, to push the detent means together so allowing them to be removed from the female portions holding them.

The interconnection components are typically solid or hollow rods, depending on the material (plastic, metal, wood or other composite, etc) and intended use. In some embodiments they will have friction areas to improve the contact with the attachment means 154.

All sorts of shapes and frames can be made up using the connector system in the present invention. These can be left as frames or can be fitted with shelving or other solid panels or can find other uses.

The connectors of the present invention can be made of any material, depending on its purpose. Thus for use as a toy, each part could be a plastic material such as injection moulded polyethylene, each part being integrally moulded, whereas for scaffolding each part might be of metal, for instance steel. There may be other uses, such as in the home (e.g. shelving) where there could be a combination of metal (e.g. steel or aluminium) and plastic and maybe even wood.

Whilst a specific system has been described and a number of variations mentioned, numerous other possibilities also exist within the scope of the invention, as would be readily apparent to the skilled man.

Claims

1. Connector means for use in a connector system, comprising:
a connector body; and
first and second anchor means: wherein
said connector body has a hollow portion therethrough;
said first anchor means can be inserted into said hollow portion from a first end thereof;
said second anchor means can be inserted into said hollow portion from a second end thereof; and
said first and second anchor means each comprise an anchor body having fixing means on one end thereof to fix themselves to each other and, thereby, to be secured within said connector body.
2. Connector means according to claim 1, wherein the fixing means of at least the first anchor means comprises a male portion and the fixing means of at least the second anchor means comprises a female portion into which said male portion can fit.
3. Connector means according to claim 2, wherein a male portion and a female portion, between them, define a snap latch.
4. Connector means according to claim 2 or 3, wherein said male portion comprises at least one detent means, the or each detent means having a cam surface at its front, a recessed detent surface to the rear of said cam surface and a flexible connecting arm, connected to the anchor body of the anchor means.
5. Connector means according to claim 2, 3 or 4, wherein said female portion comprises at least one detent receiving means, the or each detent receiving means having a cam contact surface and a recessed holding surface to the rear of said cam contact surface.

6. Connector means according to claims 4 and 5, wherein the male and female portions are constructed such that to fix the first anchor means to the second anchor means, the two anchor means are directed, relatively, towards each other, a cam surface of said first anchor means contacts the cam contact surface said second anchor means, the connecting arm flexes, the cam surface passes beyond the cam contact surface and the connecting arm unflexes at least partially, leaving the detent surface within the recess beyond the holding surface.
7. Connector means according to claim 6, wherein said male portion includes two of said detent means and said female portion includes two of said detent receiving means.
8. Connector means according to any one of claims 2 to 7, wherein the fixing means of both said first and second anchor means comprise a male portion and a female portion.
9. Connector means according to claim 8, wherein the fixing means of said first and second anchor means are substantially the same.
10. Connector means according to claim 9 wherein the first and second anchor means are constructed such that to fix the first anchor means to the second anchor means, the fixing means of said first anchor means are orientated at a position 180° relative to the fixing means of the second anchor means.
11. Connector means according to any one of the preceding claims, wherein said connector body further comprises securing means within said hollow portion, to prevent to the first and second anchor means being removed from said hollow portion whilst fixed together within said connector body.
12. Connector means according to claim 11, wherein said securing means is constructed to prevent substantial movement between the connector body and said first and second anchor means, whilst said anchor means are fixed together within said connector body.

13. Connector means according to claim 11 or 12, wherein said securing means comprise at least one protruding portion protruding into said hollow portion from the wall of said hollow portion.
14. Connector means according to claim 13, wherein said at least one protruding portion protrudes between said first and second anchor means when said anchor means are fixed together within said connector body.
15. Connector means according to claim 14, wherein said at least one protruding portion comprises a ridge running around the interior perimeter of said hollow portion at least one position between the two ends of said hollow portion.
16. Connector means according to claim 15, wherein said ridge is endless.
17. Connector means according to any one of claims 11 to 16, wherein said securing means is centrally located within said hollow portion.
18. Connector means according to any one of the preceding claims, wherein said hollow portion is substantially square in cross-section.
19. Connector means according to any one of the preceding claims, wherein said hollow portion has a substantially uninterrupted periphery.
20. Connector means according to any one of the preceding claims, further comprising access means in said connector body to allow external access to the fixing means of at least one of said anchor means when said anchor means are fixed together within said connector body.
21. Connector means according to claim 20, wherein said access means comprise at least one hole into said hollow portion.

22. Connector means according to any one of the preceding claims, wherein at least one of the anchor means further comprises attachment means for attaching said anchor means to at least one interconnection component of said system.
23. Connector means according to claim 22, wherein said attachment means are provided on an end of the anchor means body opposing that having the fixing means thereon.
24. Connector means according to claim 22 or 23, wherein at least one attachment means is directed at a non-orthogonal angle relative to the anchor body on which it is provided.
25. Connector means according to any one of claims 22 to 24, wherein at least one of said attachment means includes a pivot socket.
26. Connector means according to claim 25, wherein said at least one attachment means including a pivot socket further comprises a pivot portion within said socket, allowing the angle of the attachment means to vary relative to the anchor body.
27. Connector means according to any one of the preceding claims, wherein said connector body further comprises attachment means thereon for attaching said connector body to at least one interconnection component of said system.
28. Connector means according to any one of claims 22 to 28, wherein said attachment means comprise one or more projections for fitting inside interconnection components of said system.
29. Connector means according to claim 28, wherein said attachment means are provided with friction portions to provide a friction fit with said interconnection components.

30. Connector means according to any one of claims 22 to 29, wherein said attachment means are substantially square in cross-section.
31. Connector means according to any one of the preceding claims, wherein said connector body is substantially parallelepipedal with any attachment means extending therefrom and said hollow portion extending between two opposing faces of the parallelepiped.
32. Connector means according to claim 30 when dependent on any one of claims 27 to 29, wherein said connector body has attachment means provided on at least two different faces of the parallelepiped.
33. Connector means according to claim 30 or 31, wherein said connector body is substantial cuboidal.
34. Connector means according to any one of the preceding claims, wherein said connector body is integrally formed.
35. Connector means according to any one of the preceding claims, wherein at least one of said anchor means is integrally formed.
36. Connector means according to any one of the preceding claims, wherein said connector body is formed or at least one of a plastics material and a metal.
37. Connector means according to any one of the preceding claims, wherein said anchor means is formed or at least one of a plastics material and a metal.
38. A connector system comprising:
 - a plurality of connector means, each as defined in any one of the preceding claims, independently of each other; and
 - one or more interconnection components for linking two or more of said connector means together.

39. A connector comprising a connector body and first and second anchor means fixed together in a hollow portion passing through the connector body, the anchor means each having an anchor body having fixing means on one end thereof fixing the two anchor means to each other and, thereby, securing them within the connector body.
40. A connector body as defined in the connector means of any one of claims 1 to 37.
41. Anchor means as defined in the connector means of any one of claims 1 to 37.
42. Connector means constructed and arranged substantially as hereinbefore described, with reference to and as illustrated in the accompanying drawings.
43. A connector body constructed and arranged substantially as hereinbefore described, with reference to and as illustrated in the accompanying drawings.
44. Anchor means constructed and arranged substantially as hereinbefore described, with reference to and as illustrated in the accompanying drawings.

ABSTRACT

Connector System and Components Therefor

A connector system has connector means for use in connecting bodies together. There are any number of possible uses. When made up a connector has a connector body 102, 104, 106, 108, 110, 112 and first and second anchor means 140, 142, 144, 146, 148 fixed together in a hollow 120 portion passing through the connector body. The anchor means each have an anchor body 150 having fixing means 160 on one end thereof. These are what fix the anchor means to each other and, thereby, secure them within the connector body.

Figure 6