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(54) Cable shield terminator

(57) A terminator (8) for terminating the shield of each of a plurality of shielded cables, comprising an electrically conductive body (10) with a plurality of through holes (12), each for receiving one of the shielded cables, and terminating means (14) insertable between the shield and the insulator(s) of the conductor(s) of the cables to effect wedging in the holes thereby to make electrical contact between the shield and the body.

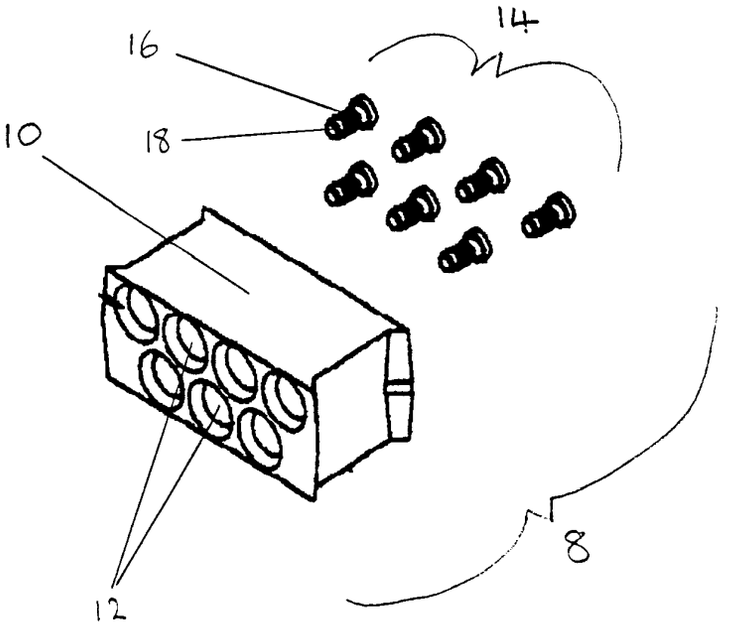

Fig. 1

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Description

[0001] The invention relates to a terminator and a method for terminating the shield of shielded cables. The invention also includes a terminator and a method for simultaneously terminating the shield of a plurality of shielded cables.

[0002] With increasing use of shielded cables to connect computers and electronic equipment together, it is becoming more and more important to ensure that the shield is fully terminated to prevent signal leakage and/or interference. The invention is applicable where a number of signal carrying conductors are to be terminated to, for example, a D-type connector, a DIN connector or an RJ45 connector. In each case the shield around the signal carrying conductors are each terminated to a different part of the connector to that of the signal carrying conductors. The shield is usually either terminated to an electrically conductive casing of the connector or to one or more contacts. In either case, the other mating half of the connector will connect to the case or contact(s) to continue the shielding.

[0003] In all of the above examples, however, the connectors are generally limited to terminating a single shielded cable enclosing one or more signal carrying conductors. Termination of the shield usually is performed by overlapping an exposed portion of the shield with a conductive part of the connector body and clamping a ferrule around them or by attaching a connecting wire between the shield and connector body by soldering.

[0004] Where a plurality of shielded cables need to be terminated to a single connector, the termination of the shield of each of the cables using the above methods tends to be difficult and unreliable. Where the cables are grouped together and the connector body is clamped around the shields, there is no guarantee that the shield of each cable will be in contact with the connector. Furthermore, movement of the cables at the entry point to the connector may move the clamped shield out of contact with the connector body. Where a connecting wire is soldered between each cable's shield and the connector, termination becomes a cumbersome and time consuming job and the connector is difficult to disassemble.

[0005] The present invention seeks to provide a terminator and method for simply and collectively terminating the shield of a plurality of shielded cables. The present invention also seeks to provide a terminator adaptable for the termination of a plurality of shielded cables in types of connectors that allow the termination of a single shielded cable such as RJ45 connectors.

[0006] According to one aspect of the invention, there is provided a terminator for terminating the shield of each of a plurality of shielded cables, comprising an electrically conductive body with a plurality of through holes, each for receiving one of the shielded cables, and terminating means insertable between the shield and an inner portion of the cables to effect wedging in the holes thereby to make electrical contact between the shield and the body.

[0007] The terminating means may comprise a plurality of individual elements, each element being insertable between the shield and the inner portion of one of the cables to effect wedging in one of the through holes. Alternatively, the terminating means may comprise a body with a plurality of projecting elements, wherein each element is insertable between the shield and the inner portion of a different one of the cables to effect wedging in an individual through hole of the terminator body.

[0008] The elements of the terminating means may taper inwardly towards their insertion ends. The elements may have an arcuate or annular cross section. The insertion end of the elements may comprise a plurality of tines.

[0009] The through holes of the terminator body may taper outwardly towards an entry end for receiving the terminating means. The terminator body may be plastics with an electrically conductive coating. The terminating means may be plastics.

[0010] According to another aspect of the present invention, there is provided a method of terminating the shield of a shielded cable comprising the steps of preparing an end of the shielded cable so that a predetermined length of the shield is exposed, feeding the prepared end into a through hole of a terminator as previously described, inserting terminating means of the terminator between the shield and an inner portion of the cable and wedging the inserted terminating means in the through hole, thereby forcing the shield into contact with the terminator.

[0011] The method may be adapted for terminating the shield of a plurality of shielded cables, the adapted method including the steps of preparing an end of each of the shielded cables so that a predetermined length of the shield is exposed, feeding each of the prepared ends into an individual through hole of a terminator as previously described, inserting terminating means of the terminator between the shield and an inner portion of the cables and simultaneously wedging the inserted terminating means in the through holes, thereby forcing the shield into contact with the terminator.

[0012] The wedging may be performed using a parallel action jaw tool.

[0013] The step of feeding the prepared cable(s) into the through hole(s) may comprise feeding the cable(s) through the through hole(s) so that the exposed shield exits the through hole and a step of feeding the exposed shield back into the through hole may precede the step of wedging the inserted terminating means in the through hole(s).

[0014] According to a further aspect of the present invention, there is provided a connector assembly including a connector body and a terminator as previously described for receiving a plurality of shielded cables, wherein the connector body is electrically connected to

the terminator body.

[0015] According to another aspect of the present invention, there is provided a connector assembly including a connector body, a contact and a terminator as previously described for receiving a plurality of shielded cables, wherein the contact is adapted to be electrically connected to the terminator body.

[0016] In order that the invention and its various other preferred features may be understood more easily, some embodiments thereof will now be described, by way of example only, with reference to the drawings, in which:-

Figure 1 is a perspective view of the separated parts of a terminator constructed in accordance with the invention,

Figure 2 is a perspective view of the separated parts of the terminator of Figure 1 with a prepared shielded cable inserted,

Figure 3 is a cross-sectional view transversely of the axis of a through hole of the terminator of Figure 2 with the shielded cable terminated,

Figure 4 is a perspective view of the separated parts of another terminator constructed in accordance with the invention, and

Figure 5 is an exploded perspective view of a connector incorporating a terminator and constructed in accordance with the invention.

[0017] The embodiments described relate to the termination of a shielded cable having a single signal carrying conductor such as a coaxial cable, however, the described terminator and method are equally applicable to cable types such as shielded twisted pairs where a plurality of signal carrying conductors are surrounded by a single shield.

[0018] Figure 1 is a perspective view of a terminator 8 comprising an electrically conductive terminator body 10 and terminating means 14. The terminator body 10 has a plurality of through holes 12, in this case 7, each through hole 12 being capable of receiving a shielded cable. The exact positioning and number of through holes 12 will depend upon the number of shielded cables to be terminated and the connector with which the terminator is to be used. In the present embodiment, the terminator is designed for terminating cables to a D-type connector.

[0019] The terminating means 14 comprises a number of individual elements equal to the number of through holes. Each element has a portion 16 insertable into one of the through holes. Each element has a through hole 18 concentric to the portion 16.

[0020] A method of termination a shielded cable using the terminator 8 will now be described with reference to Figure 2. A shielded cable 20 is prepared by stripping away a predetermined length of outer jacket 21 to expose the shield 22 of the cable. Depending upon the positioning of the terminator 8 within the connector, particularly the distance between the terminator 8 and contacts to which signal carrying conductors 26 of the cable must be connected, it may be necessary to strip back a length of the shield 22 to expose the insulator 24 and conductor 26 of the cable 20. The prepared cable 20 is then fed into an unoccupied through hole 12 of the terminator body 10 so that the exposed shield 22 exits the other end of the through hole 12. One of the elements of the terminating means 14 is then inserted onto the stripped cable so that the stripped insulator 24 is fed through the through hole 18. The portion 16 of the element is inserted between the exposed shield 22 and the stripped insulator 24 so that the exposed shield lies over the portion 16. The cable is fed back through the through hole 18 and the exposed shield 22 is wedged into contact with the terminator body 10 by the portion 16, thereby terminating the shield of the cable as is shown in Figure 3.

[0021] The elements of the terminating means 14 could be joined together by a body 19 in the same pattern as the through holes 12 of the terminator body 10, as shown in Figure 4, so that a prepared cable 20 could be inserted in each through hole 12, the terminating means 14 can then be inserted onto the cables 20 and wedge each shield into a particular one of the through holes 12 of the terminator body 10 to simultaneously terminate the shield 22 of each of the plurality of cables 20.

[0022] A D-type connector assembly including the terminator, as previously described, is shown in exploded view in Figure 5. The cables 20 are terminated to the terminator body 10. The signal carrying conductors of the cables are terminated each to a different contact 52 of the connector. Conductive body shells 50, 51 of the connector are fitted around the cables 20, the terminator 10, the contact 52 and around screw fixings 54. The shells 50, 51 are secured together by screws 56 and nuts 58. Once assembled, the terminator 10 is in direct electrical contact with the shells 50, 51 which are electrically conductive to continue the shielding of the terminator.

[0023] The terminator could alternatively be electrically connected to the body of the connector or to a contact by a connecting wire soldered or otherwise attached therebetween.

[0024] The elements of the terminating means could taper inwardly to facilitate the insertion and wedging of the shield in the through holes. There could be some cooperating profile between the through holes and the elements such as a projection and groove to provide a locking action of the terminating means in the through holes in addition to the wedging. The portion 16 of the elements could comprise a plurality of tines instead of the cylindrical formation to allow the terminating means to be slightly flexible during insertion and wedging in the

through holes. The elements 16 may have an elongate split to enhance their flexibility. The elements need not have an annular cross section. The elements could be arcuate in cross section thereby only wedging some of the shield into contact with the through holes.

[0025] The through holes could be tapered outwardly at their ends intended for receiving the terminating means. In this way, the exposed shield need not be fed out of the terminator body and then fed back in again as the exposed shield would be accessible inside the through hole due to the taper. The elements of the terminating means could have a corresponding profile, tapering outwardly to provide a snug fit in the through hole.

[0026] Preferably, the wedging is performed using a parallel jaw action tool to push the elements into the through holes. A specialised tool having an array of parallel action jaws may be provided for certain terminator configurations so that a plurality of elements ready to be wedged in through holes may be simultaneously wedged into the through holes.

[0027] The terminator body may be made of plastics and provided with an electrically conductive coating or layer. The terminating means may also be made of plastics.

Claims

1. A terminator (8) for terminating the shield (22) of each of a plurality of shielded cables (20), comprising an electrically conductive body (10) with a plurality of through holes (12), each for receiving one of the shielded cables (20), and terminating means (14) insertable between the shield (22) and the insulator(s) (24) of the conductor(s) (26) of the cable (20) to effect wedging of the shield (22) in the holes (12) thereby to make electrical contact between the shield (22) and the body (10).

2. A terminator (8) as claimed in claim 1, wherein the terminating means (14) comprises a plurality of individual elements, each element being insertable between the shield (22) and the insulator(s) (24) of the conductor(s) (26) of one of the cables (20) to effect wedging of the shield (22) in one of the through holes (14).

3. A terminator (8) as claimed in claim 1, wherein the terminating means (14) comprises a body (19) with a plurality of projecting elements, wherein each element is insertable between the shield (22) and the insulator(s) (24) of the conductor(s) (26) of a different one of the cables (20) to effect wedging of the shield (22) in an individual through hole (12) of the terminator body (10).

4. A terminator (8) as claimed in claim 2 or 3, wherein the elements of the terminating means (14) taper inwardly towards their insertion ends.

5. A terminator (8) as claimed in any one of claims 2 to 4, wherein the elements have an arcuate cross section.

6. A terminator (8) as claimed in any one of claims 2 to 4, wherein the elements have an annular cross section.

7. A terminator (8) as claimed in any one of claims 2 to 6, wherein the insertion end of the elements comprises a plurality of tines.

8. A terminator (8) as claimed in any one of the preceding claims, wherein the through holes (12) of the terminator body taper outwardly towards an entry end for receiving the terminating means (14).

9. A terminator (8) as claimed in any one of the preceding claims, wherein the terminator body (10) is plastics with an electrically conductive coating.

10. A terminator (8) as claimed in any one of the preceding claims, wherein the terminating means (14) is plastics.

11. A method of terminating the shield (22) of a shielded cable (20) comprising the steps of preparing an end of the shielded cable (20) so that a predetermined length of the shield (22) is exposed, feeding the prepared end into a through hole (12) of a terminator (8) as claimed in any one of the preceding claims, inserting terminating means (14) of the terminator between the shield (22) and the insulator(s) (24) of the conductor(s) (26) of the cable (20) and wedging the shield (22) in the through hole (12), thereby forcing the shield (22) into contact with the terminator (8).

12. A method of terminating the shield (22) of a plurality of shielded cables (20) in accordance with the method of claim 11, including the steps of preparing an end of each of the shielded cables (20) so that a predetermined length of the shield (22) is exposed, feeding each of the prepared ends into an individual through hole (12) of a terminator (8) as claimed in any one of claims 1 to 10, inserting terminating means (14) of the terminator (8) between the shield (22) and the insulator(s) (24) of the conductor(s) (26) of the cables (20) and simultaneously wedging the shield (22) in the through holes (12), thereby forcing the shield (22) into contact with the terminator (8).

13. A method as claimed in claim 11 or 12, wherein the wedging is performed using a parallel action jaw tool.

14. A method as claimed in claim 11, 12 or 13, wherein the step of feeding the prepared cable(s) (20) into the through hole(s) (12) comprises feeding the cable(s) (20) through the through hole(s) (12) so that the exposed shield (22) exits the through hole (12) and a step of feeding the exposed shield (22) back into the through hole (12) precedes the step of wedging the shield (22) in the through hole(s) (12).

15. A connector assembly including a connector body (50, 51) and a terminator as claimed in any one of claims 1 to 10 for receiving a plurality of shielded cables (20), wherein the connector body (10) is electrically connected to the terminator body (50, 51).

16. A connector assembly including a connector body (50, 51), a contact (52) and a terminator as claimed in any one of claims 1 to 10 for receiving a plurality of shielded cables (20), wherein the contact (52) is adapted to be electrically connected to the terminator body (50, 51).

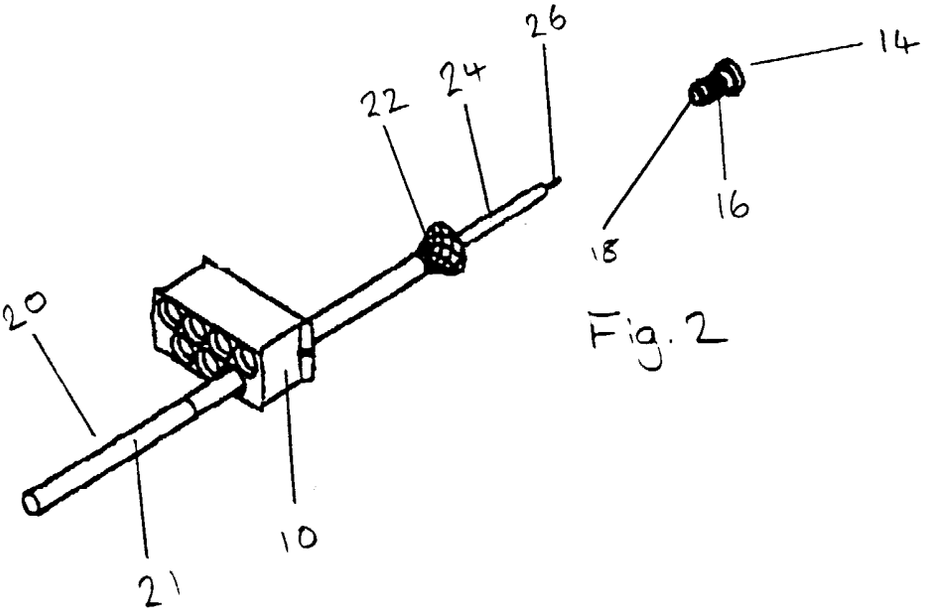

Fig. 2

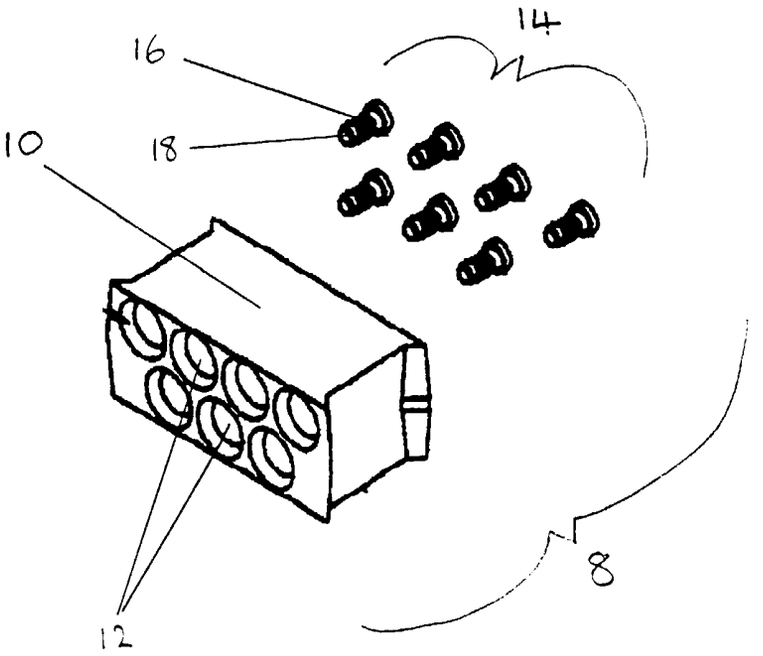

Fig. 1

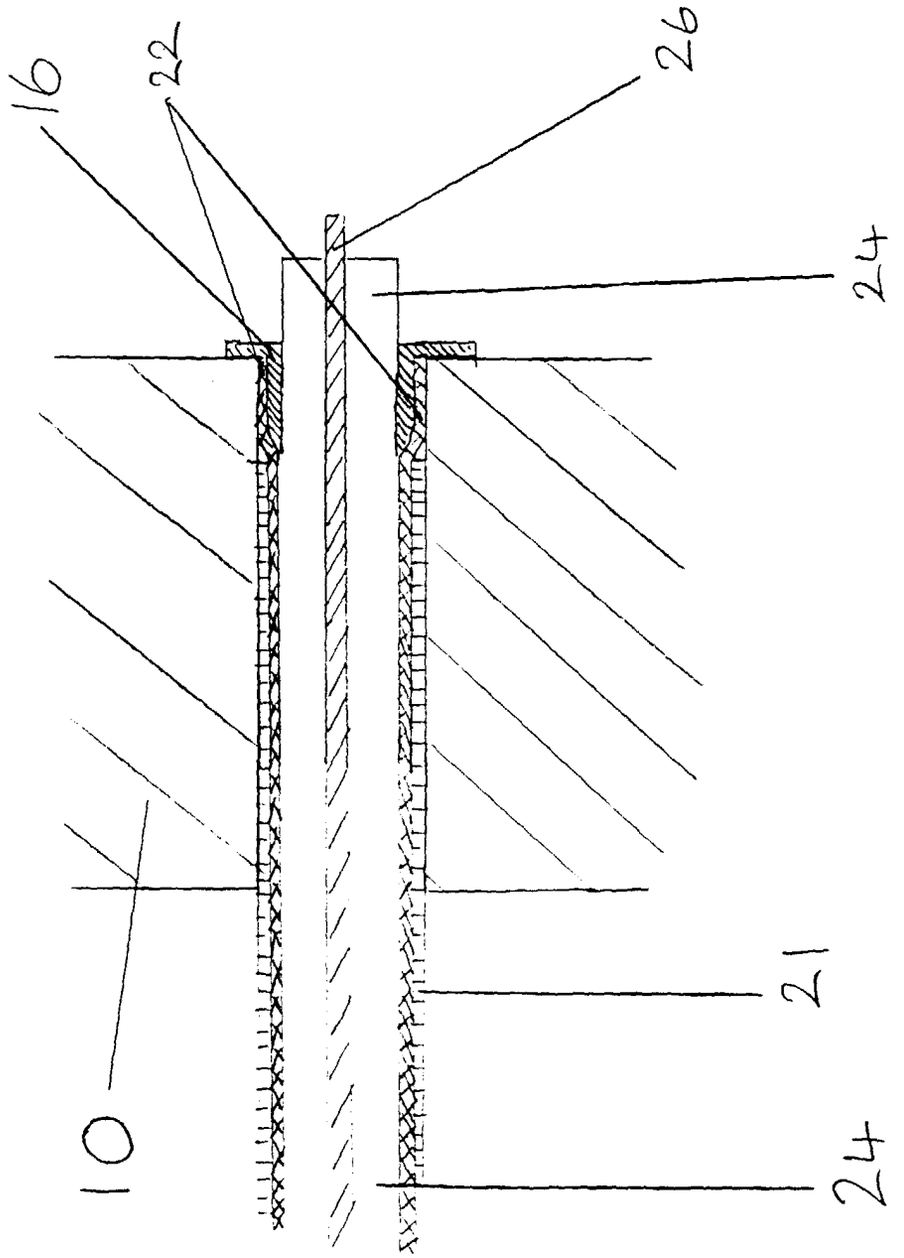

Fig. 3

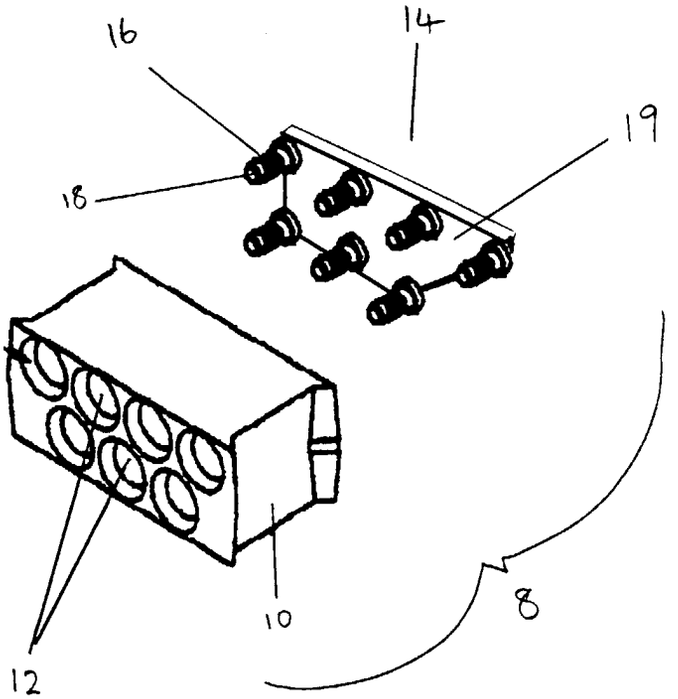

Fig. 4

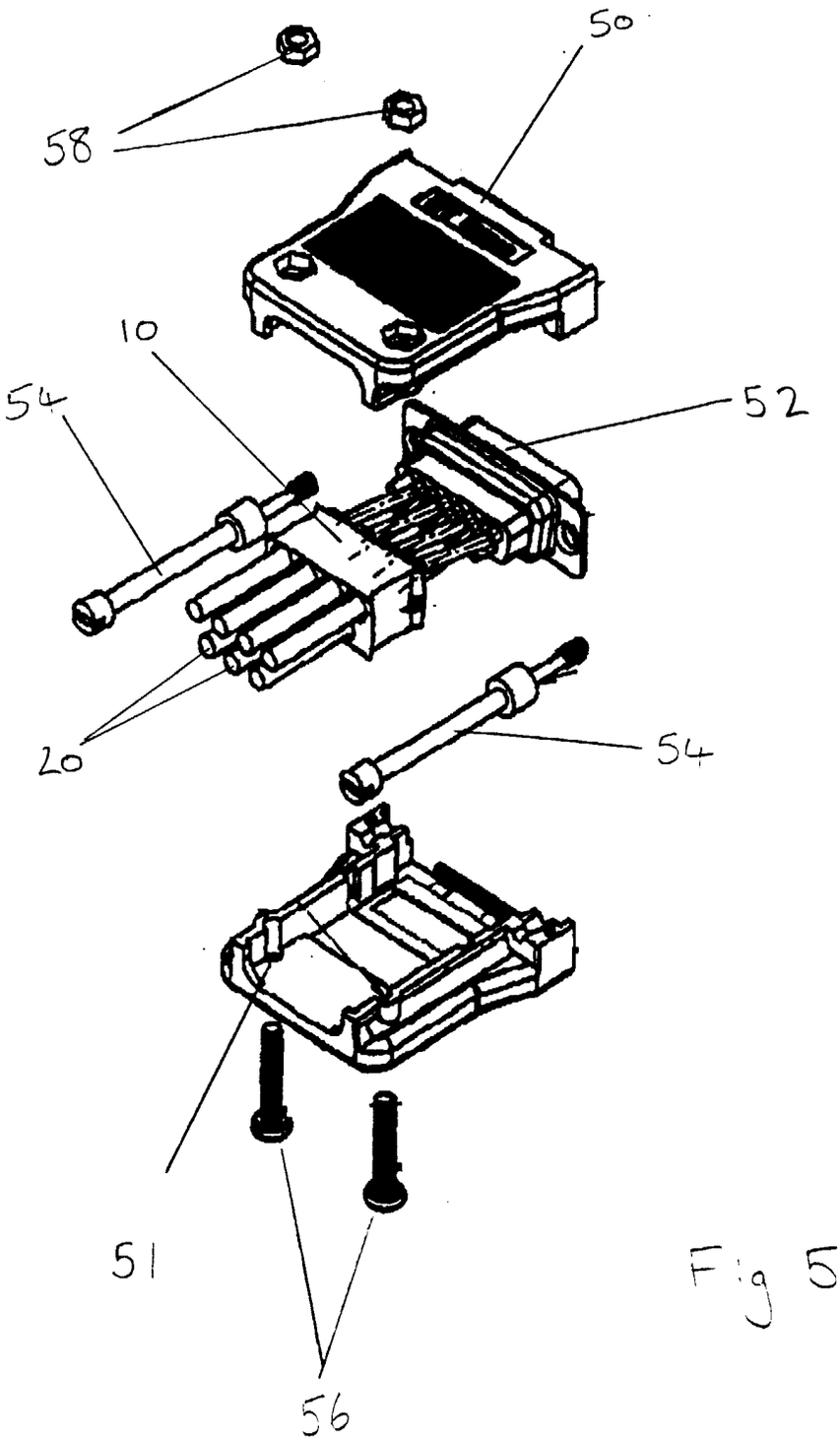

Fig 5