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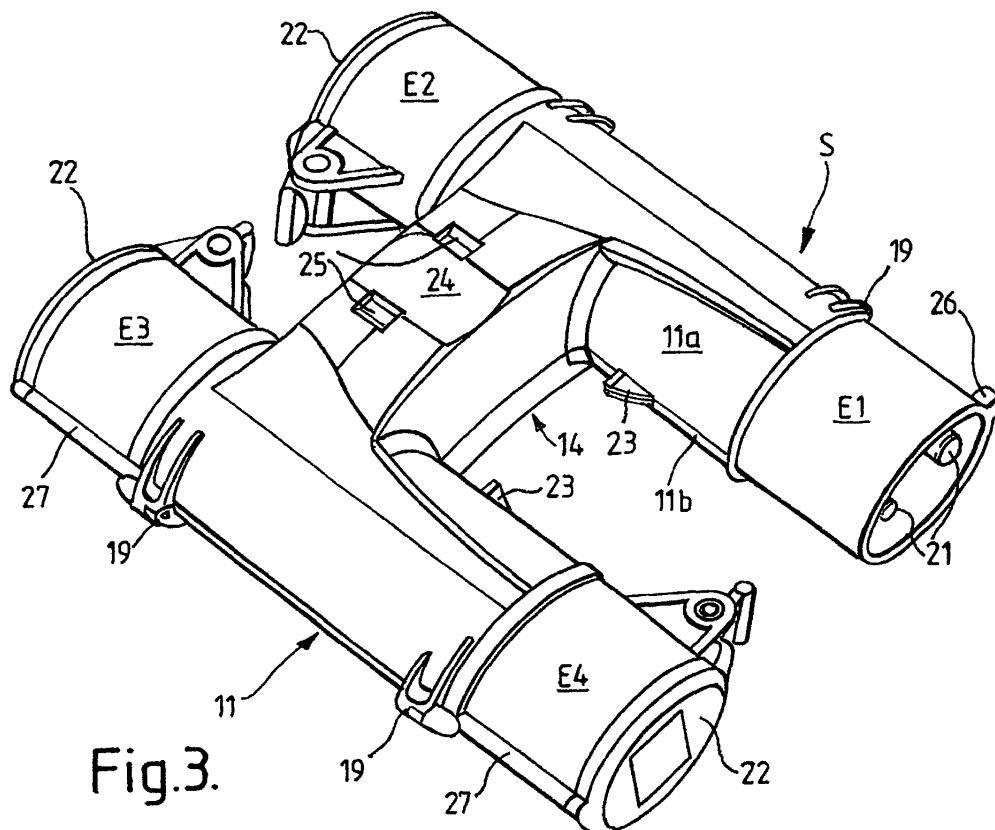
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(54) **Splitter**

(57) A splitter comprises a main body (11), an input connector (E1) and at least two output connectors (E2 to E4). The connectors (E1 to E4) are fixed to the main body (11), and electric wiring housed within the main body connects the input connector (E1) to each of the output connectors (E2 to E4). Each of the connectors

(E1 to E4) is configured for mating connection in a pre-determined connection direction with a complementary connector fixed to a respective electric cable. The arrangement is such that the connection direction of each output connector (E2 to E4) is substantially parallel to the connection direction of the input connector (E1).



Description

[0001] This invention relates to a cable splitter, and in particular to a cable splitter for use in the TV/film industries for management of electric cables.

[0002] A triangular rigging is used, in the TV/film industries, for supporting lighting, speakers etc, the rigging housing the electric cabling for those pieces of equipment. An input power cable is fed along the interior of the rigging, and cable splitters are provided for feeding power, via branch cables, to electrical equipment fixed to the rigging. Typically, a splitter will include a connector for connection to an incoming power cable, a connector for continuing the run of the power cable along the rigging, and at least one branch cable connector. Currently, box-shaped splitters, such as those shown in Figures 1a and 1b, have output connectors at right-angles to the input. Thus, as shown schematically in Figure 1a, a splitter 1 has an input connector designated by an arrow 1a, an output connector, designated by an arrow 1b, for the continuing cable run, and a pair of connectors, designated by arrows 1c and 1d, for branch cables. Figure 1b shows a similar arrangement, but with the two output connectors 1c and 1d positioned on the same side of the splitter 1. A third type of known connector (see Figure 1c) is generally Y-shaped, and has the branch cable connectors 1c and 1d angled with respect to the longitudinal axis of the splitter.

[0003] The disadvantage of these known types of splitter is that exits for the branch cables are angled with respect to the line of the run of the main power cable, so that the branch cables must be threaded from the splitters outside the rigging, and then must be fed back inside the rigging before being fed further along the rigging for connection to the associated piece of electrical equipment. In this connection, it should be understood that power cables for this type of electrical system are relatively thick and inflexible, so that splitters cannot be located immediately adjacent to their associated pieces of electrical equipment.

[0004] The present invention provides a splitter comprising a main body, an input connector and at least two output connectors, the connectors being fixed to the main body, and electric wiring housed within the main body connecting the input connector to each of the output connectors, each of the connectors being configured for mating connection in a predetermined connection direction with a complementary connector fixed to a respective electric cable, wherein the arrangement is such that the connection direction of each output connector is substantially parallel to the connection direction of the input connector.

[0005] In a preferred embodiment, there are three output connectors, and the main body has first and second substantially parallel, hollow arms joined by a hollow cross-piece, the input connector being fixed to a first end of one arm, and the three output connectors being connected respectively to the second end of said one arm

and to first and second ends of the other arm. In this case, the splitter is of H-shaped configuration.

[0006] Advantageously, the main body is formed from two identical mouldings, and the mouldings are made of a plastics material such as polybutylene terephthalate (PBT)

[0007] Preferably, each of the mouldings is formed with complementary projections and recesses for mating with respective recesses and projections on the other moulding.

[0008] Conveniently, each of the moulding portions which defines part of the cross-piece is formed with a concave depression for engagement against a curved support member. The main body section may be apertured to receive a tie tag for engagement around said support member, thereby to fix the splitter to said support member.

[0009] In a preferred embodiment, the input and output connections are so constructed and positioned relative to the main body that the input connector cannot be fitted into an output connector of a substantially similar splitter, and such that the input connector of a substantially similar splitter cannot be fitted into one of its output connectors.

[0010] The invention will now be described in greater detail, by way of example, with reference to Figures 2 to 5 of the drawings, in which:-

Figure 2 is a perspective view of a cable splitter constructed in accordance with the invention, the cable splitter being strapped to a support rigging;

Figure 3 is a perspective view of the cable splitter;

Figure 4 is a perspective view of one of the two mouldings used to form the main body of the splitter; and

Figure 5 is a circuit diagram showing the internal wiring of the cable splitter.

[0011] Referring to the drawings, Figure 2 shows part of a triangular rigging R used in the TV/film industries for supporting lighting, speakers, etc. A cable splitter S constructed in accordance with the invention is shown strapped to one of the uprights of the rigging R. Four electric cables C1 to C4 are associated with the splitter S, the cable C1 being the main input cable, the cable C2 being the cable which continues the cable run along the rigging, the cable C3 is a branch cable leading to a piece of electrical equipment (not shown) attached to the rigging R, and the cable C4 is a further branch cable which leads either to another piece of electrical equipment (not shown) fixed to the rigging or to further electrical equipment (not shown) positioned elsewhere.

[0012] As shown in Figure 3, the splitter S has a main body indicated generally by the reference numeral 11, this body being constituted by two identical mouldings

11a, and 11b, one of which (11a) is shown in Figure 3. The mouldings 11a and 11b are made of a plastics material such as PBT. The moulding 11a has a pair of generally semi-cylindrical hollow portions 12 and 13 joined together by a cross member 14. The mouldings 11a and 11b are such that, when placed together, their portions 12 and 13 define substantially hollow cylindrical portions, and their portions 14 define a generally rectangular hollow portion which is contiguous with, and at right-angles to, the hollow cylindrical portions. The edge portions of the two mouldings 11a and 11b which, in use, adjoin one another are provided with inter-engagable locking means such as the tabs 15 and the recesses 16. One of these edge portions is formed with an upstanding longitudinally-extending flange (not shown), the other edge portion being formed with a longitudinally-extending recess (not shown) whose shape complements that flange. These flanges and recesses of the two mouldings 11a and 11b mate when the mouldings are joined together.

[0013] The semi-cylindrical portion 12 of the moulding 11a is provided with a pair of arcuate protrusions 17, each of which is formed with a shoulder 17a and an apertured portion 17b. Similarly, the portion 13 is formed with a pair arcuate protrusions 18, each of which is formed with a shoulder 18a and an apertured portion 18b. The protrusions 17 and 18 are arranged so that, when the two mouldings 11a and 11b are joined together, the apertured portions 17b of one of the portions 12 mates with the shoulders 18a of the portion 13 of the other moulding, and vice versa. In this way, the main body 11 defines apertured flanges, indicated generally by the reference numerals 19 (see Figure 4) which are used, in the manner described below, to fix connectors to the main body.

[0014] As shown in Figure 3, a respective electric connector E1 to E4 is fixed to each end of the two hollow cylindrical portions of the completed main body 11. Each of the connectors E1 to E4 is formed with an annular, outwardly-projecting flange (not shown) which mates with a complementary recess formed in the respective cylindrical end portion of the main body 11. These recesses are defined by semicircular recesses 20 formed at both ends of each of the semi-cylindrical hollow portions 12 and 13 of the mouldings 11a and 11b. In order to connect a given one of the connectors E1 to E4 to the main body 11, its flange is inserted into the corresponding recess, and the connector is then held in place by a screw which passes through the respective apertured flange 19 and into a blind bore in an outwardly-projecting tag 20 formed on that connector.

[0015] The connector E1 constitutes a plug, having three standard plug pins 21, only two of which can be seen. The other three connectors E2 to E4 are sockets, and each is provided with a lid 22 pivotally connected thereto. Each lid 22 is spring biased towards the position shown in Figure 4, in which the lid completely covers the socket connections (not shown), these socket connec-

tions being complementary to the pins 21.

[0016] In use, the main input cable C1 is provided with a socket similar to the sockets E2 to E4, this socket being a slidable fit over the plug connector E1. The cables C2 to C4 are each provided with a plug connector similar to the connector E1, so that these cables can be connected respectively to the socket connectors E2 to E4. When each of these plug/socket connections is made, the lid 22 of the socket is pivoted away from its closed position to permit the connection to be made. The interior of each such lid 22 is provided with a tag (not shown). For the plug/socket connection between the connector E1 and the socket attached to the end of the cable C1, the tag of the lid of that socket connector engages behind a tag 23 formed on the main body 11, thereby holding that lid in its fully open position.

[0017] Each of the mouldings 11a and 11b is formed with an arcuate depression 24 positioned centrally within its portion 14. A respective arcuate aperture 25 (only the two end portions of which can be seen) is integrally formed with each moulding 11a, 11b so as to extend behind the respective depression 24. In use, the splitter can be positioned with one of the depressions 24 against one of the components of the triangular rigging R, and the splitter can then be attached to the rigging using a tie tag passing through the associated aperture 25 and round the associated rigging member. Alternatively, the splitter could be attached to one of the cross members of the rigging R using a similar tie tag which passes through an aperture (not shown) formed in an extension of the main body portion provided in the generally rectangular hollow portion at the top thereof.

[0018] Figure 5 is a circuit diagram showing the wiring that connects the connector E1 to the connectors E2 to E4, this wiring being accommodated within the hollow cylindrical portions and the hollow rectangular portion of the main body 11.

[0019] The connector E1 is formed with an outwardly-projecting key 26, and the socket of the main input cable C1 is provided with a keyway which, in use, mates with the key 26.

[0020] This feature ensures that only sockets of a predetermined type can be connected to the plug connector E1, thereby ensuring that this splitter can only be used with predetermined input cables. Each of the connectors E2 to E4 is formed with an internal keyway which complements the shape of the keyway 26. Those keyways are formed by outwardly projecting, curved portions 27 of the mouldings from which the connectors E2 to E4 are formed. The plug connectors associated with the cables C2 to C4 are formed with keys of the same type as the key 26, thereby ensuring that only output cables having the correct plug connectors can be connected to the connectors E2 to E4.

[0021] The provision of the key 26 on the connector E1, and the firm connection of the connectors E1 to E4 to the main body 11 of the splitter S, ensures that two such splitters cannot be connected directly together.

Thus, if an attempt were made to fit the connector E1 of a first splitter S into one of the connectors E2 to E4 of a second splitter S, when the pins of the connector E1 of the first splitter are aligned with the corresponding socket holes of the connector (say E2) of the second splitter, and the key 26 of the connector E1 is aligned with the keyway 27 of that connector of the second splitter, the free end of the adjacent connector E4 of the first splitter will be in face-to-face engagement with the free end of the adjacent connector (E3 in this case) of the second splitter, thereby preventing the two splitters from being connected together. Moreover, because of the way in which the connectors E1 to E4 are connected to the main body 11 by means of the screws passing through the apertured flanges 19 and the blind bores in the outwardly-projecting tags 20, it is not possible to turn one of the connectors E1 to E4 through 180° in an attempt to enable two splitters to be connected together.

[0022] It will be apparent that the splitter described above permits the cables C2 to C4 to be fed along the rigging R either to an associated piece of electrical equipment or to a further splitter, without those cables having to be fed outside the rigging and then back into the rigging. This is as a result of the in-line cable management which results from the configuration of the splitter. Thus, each of the cables C2 to C4 lies substantially parallel to the input cable C1, at least in the regions where the cables are connected to the splitter.

Claims

1. A splitter comprising a main body, an input connector and at least two output connectors, the connectors being fixed to the main body, and electric wiring housed within the main body connecting the input connector to each of the output connectors, each of the connectors being configured for mating connection in a predetermined connection direction with a complementary connector fixed to a respective electric cable, wherein the arrangement is such that the connection direction of each output connector is substantially parallel to the connection direction of the input connector.
2. A splitter as claimed in claim 1, wherein there are three output connectors, and the main body has first and second substantially parallel, hollow arms joined by a hollow cross-piece, the input connector being fixed to a first end of one arm, and the three output connectors being connected respectively to the second end of said one arm and to first and second ends of the other arm.
3. A splitter as claimed in claim 1 or claim 2, wherein the main body is formed from two identical mouldings.
4. A splitter as claimed in claim 3, wherein the mouldings are made of a plastics material.
5. A splitter as claimed in claim 4, wherein the plastics material is PBT.
6. A splitter as claimed in any one of claims 3 to 5, wherein each of the mouldings is formed with complementary projections and recesses for mating with respective recesses and projections on the other moulding.
7. A splitter as claimed in any one of claims 3 to 6, wherein each of the moulding portions which defines part of the cross-piece is formed with a concave depression for engagement against a curved support member.
8. A splitter as claimed in claim 7, wherein the main body is apertured to receive a tie tag for engagement around said support member, thereby to fix the splitter to said support member.
9. A splitter as claimed in any one of claims 1 to 8, wherein the input and output connections are so constructed and positioned relative to the main body that the input connector cannot be fitted into an output connector of a substantially similar splitter, and such that the input connector of a substantially similar splitter cannot be fitted into one of its output connectors.

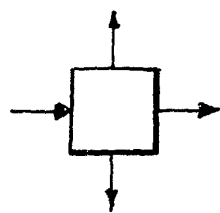


Fig.1a.

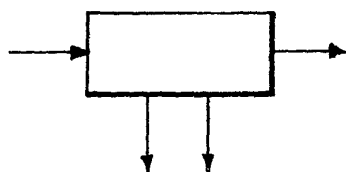


Fig.1b.

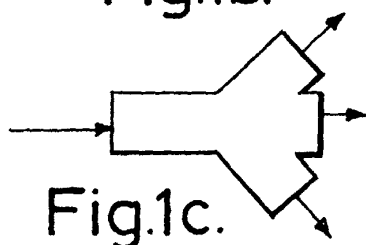


Fig.1c.

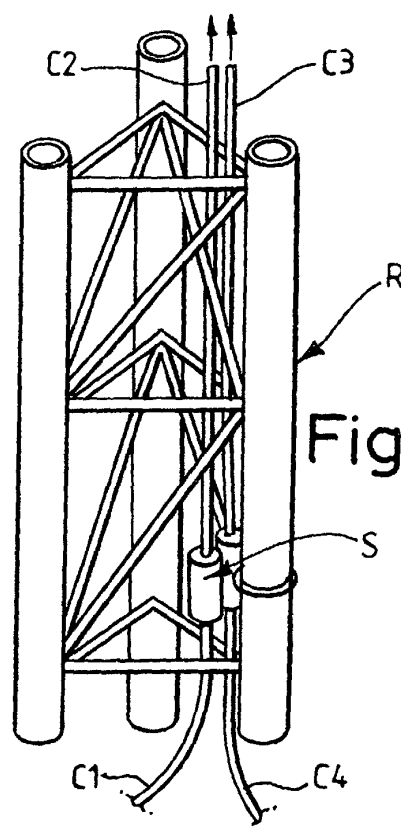


Fig.2.

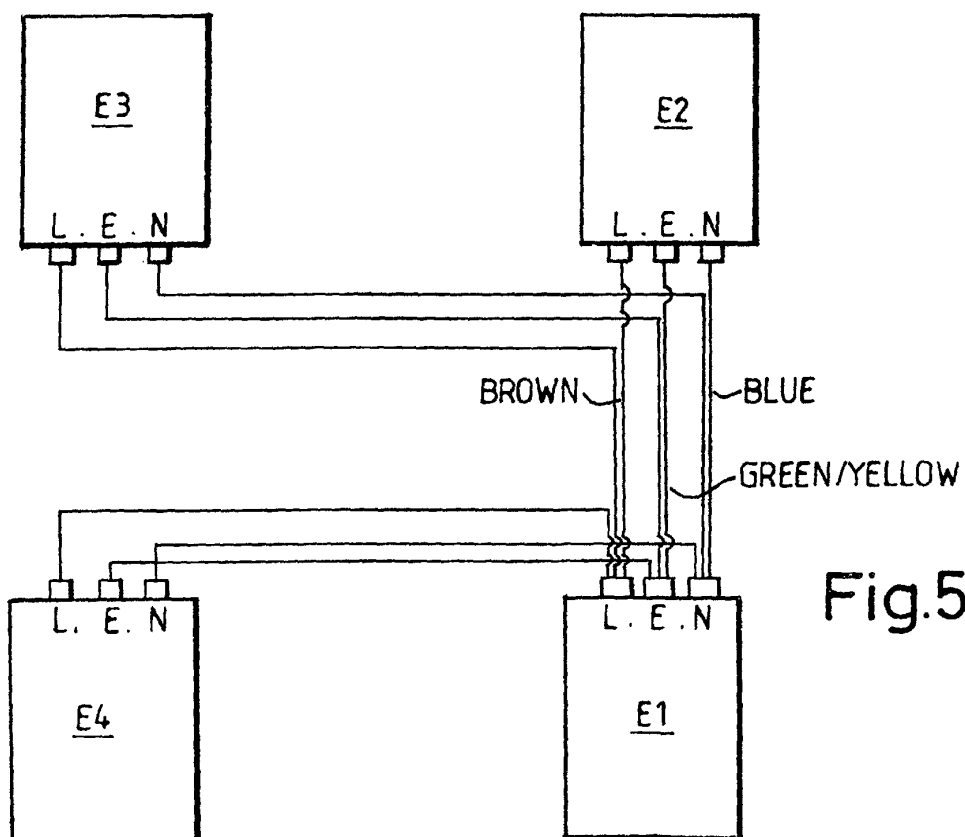
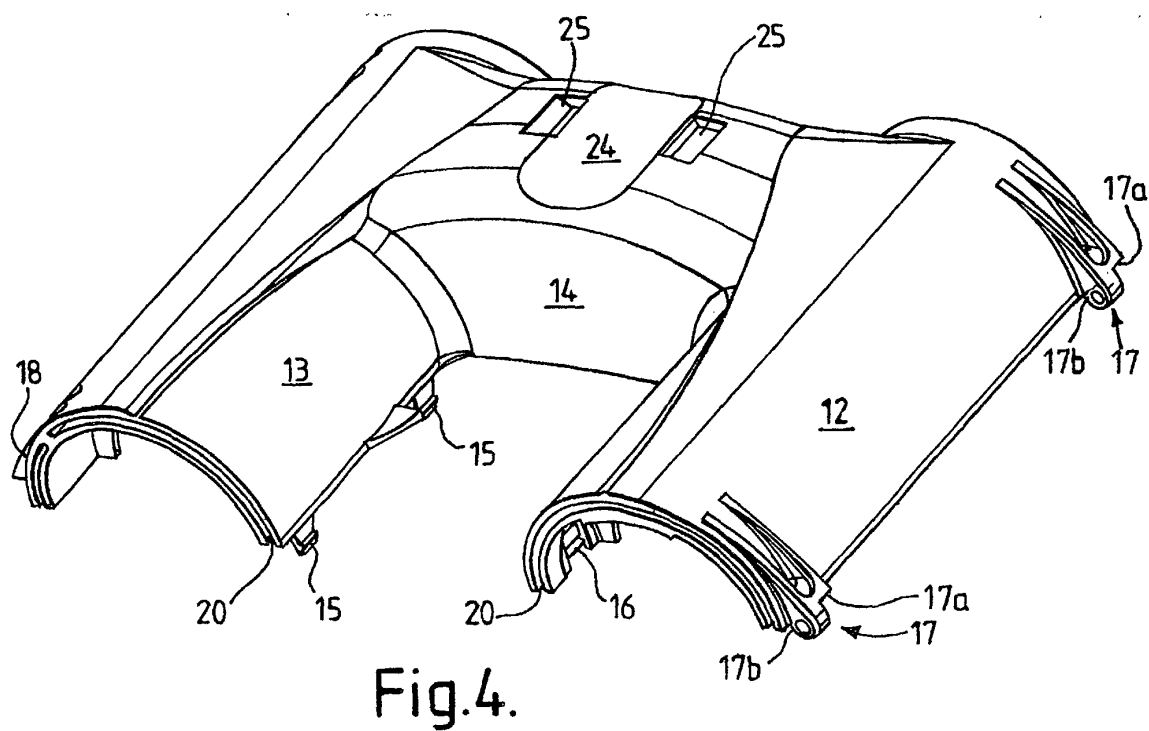
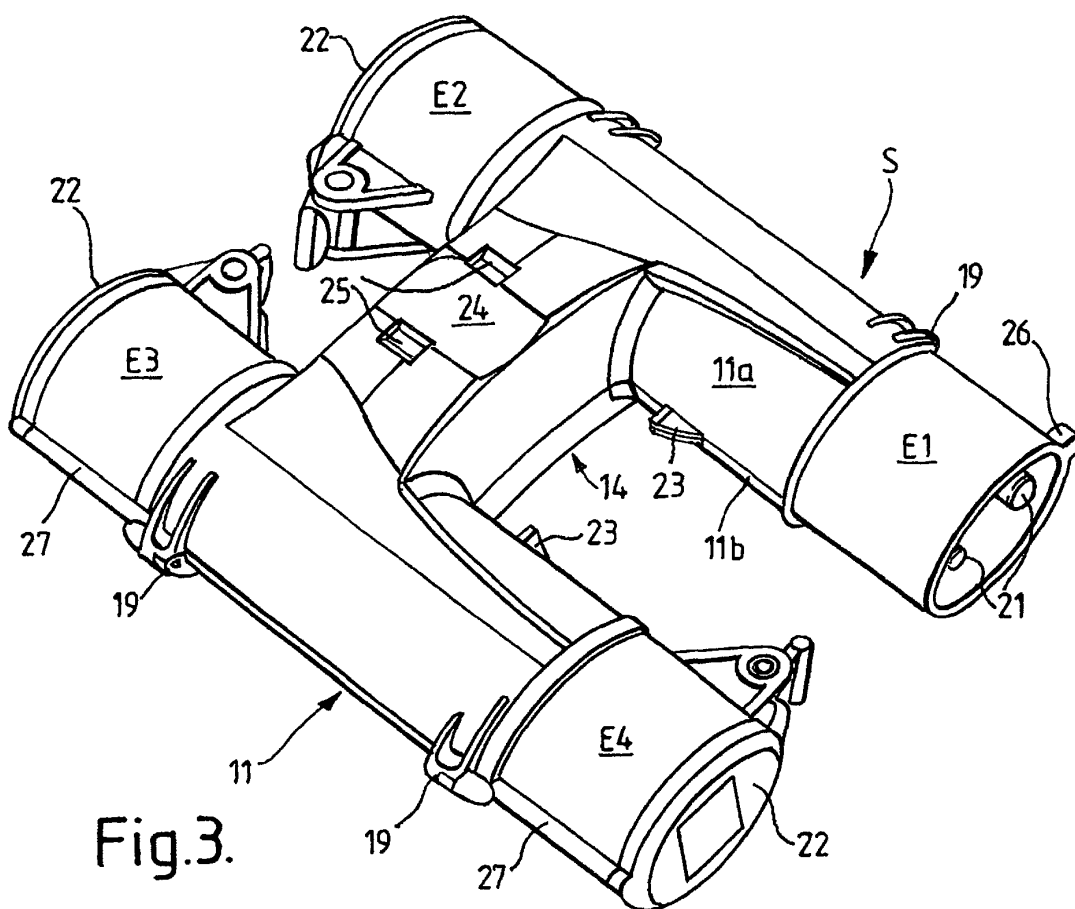


Fig.5.





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Application Number
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Place of search THE HAGUE		Date of completion of the search 21 May 2003	Examiner Lommel, A
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