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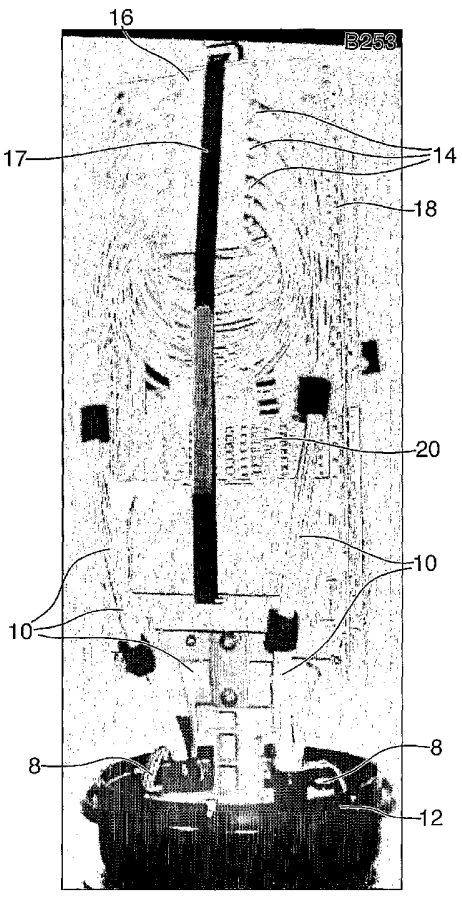
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(54) Title: ORGANISER FOR OPTICAL FIBRE CABLES



(57) Abstract: A loose tube organiser (16) for use in conjunction with a portion of an optical fibre cable from which the cable sheath has been stripped to expose loose tubes (10) extending within the cable, the loose tube organiser comprising a number of interconnected retaining members (14), each retaining member being capable of releasably holding loops (11) of one of the exposed loose tubes separately from loops of the other loose tubes respectively held by the other retaining members in use.

WO 2004/113982 A1

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ORGANISER FOR OPTICAL FIBRE CABLES

This invention relates to organisers for optical fibre cables. Optical fibre cables are often constructed with an outer cable sheath surrounding a number of so-called "loose tubes" and a "strength member" for resisting axial tensile stresses which the cable may experience in use. The number of loose tubes in a cable may vary, one example of such cables containing 16 loose tubes. Each loose tube encloses a number of individual optical fibres, some of which may need to be accessed from time to time for splicing to other fibres, or for connection to other optical components, for example optical splitters, as known per se. Such access is required where optical fibre splice organisers, for example the range supplied by Tyco Electronics Corporation under the "FIST" trade mark, are located in the telecommunication network.

Access to the fibres involves removal of an intermediate section of the cable sheath to expose the enclosed loose tubes, followed by partial or complete removal of the tube wall of one or more of the exposed loose tubes to reveal the enclosed optical fibres. The removal of the tube wall is commonly called "shaving" the tube, being a necessarily delicate operation requiring care to avoid damage to the revealed optical fibres. The resulting exposed length of the loose tubes is usually gathered into loose loops each containing a few or several turns.

The present invention provides a loose tube organiser for use in conjunction with a portion of an optical fibre cable from which the cable sheath has been stripped to expose loose tubes extending within the cable, the loose tube organiser comprising a number of interconnected retaining members, each retaining member being capable of releasably holding loops of one of the exposed loose tubes separately from loops of the other loose tubes respectively held by the other retaining members in use.

The invention also provides an optical fibre splice enclosure, fibre rack, shelf, or box, in association with this loose tube organiser, either in the form of a kit for assembly at time of installation, or preferably with the loose tube organiser attached to other components of, on, or in, the enclosure, rack, shelf, or box.

The loose tube organiser is preferably attached to components to be enclosed by the enclosure, the loose tube organiser in use retaining the loops of loose tubes awaiting shaving in the same enclosure as the optical fibres already revealed. The loose tube organiser is preferably releasably attached to the structure which supports fibre organiser trays and other components and which fits within the enclosure housing. The retaining members may be of any convenient design, resilient clips or open-sided resilient tubes of suitable size for lateral insertion and resilient holding of the loose tube loops being preferred.

The splice enclosure and loose tube organiser according to this invention advantageously avoid or reduce tangling of the loose tubes, which occurs when the exposed loose tubes are simply bundled together or pushed into a basket, bag or box. Tangling increases installation times and costs and risks damage to the optical fibres when one of the loose tubes is being separated out from the others for shaving and subsequent procedures. Because the exposed portions of the loose tubes are respectively held in the separate retaining members of the loose tube organiser according to this invention, any one of the loose tubes may at any desired time be released from its retaining member and moved away from the other loose tubes held by the organiser, with negligible risk of tangling or damage. The optical fibres revealed by shaving of the loose tubes are organised and protected by arrangements known per se.

An embodiment of the present invention is illustrated by way of example in the accompanying pictures, wherein:

Picture 1 shows a loose tube individual storage organizer according to this invention applied in a FIST-GCOG2 closure (TYCO). The incoming and outgoing ends of the stripped portion of the cable sheath and its strength member 8 are secured to the base 12 of the enclosure, and the sixteen exposed loose tubes 10 are respectively looped and arranged in corresponding retaining members 14 of two loose tube organisers 16 according to this invention, each having eight retaining members. The two organisers are releasably attached by straps 17 on opposite sides of the frame 18 holding the fibre organiser groove plates 20 and other components such as organiser trays (not shown), all of which will be enclosed when the known domed cover

(not shown) is secured to the base 12. The loose tubes are thus stored in a selected order to avoid crossings and tangling for easy access later.

Picture 2 shows the nearer of the two loose tube organisers 16 released from the frame 18, allowing the organiser and its separately-retained loops 11 of the loose tubes to rest on a nearby work surface 22.

Picture 3 shows a selected loose tube 24 removed from its retaining member 26 and separated from the others in preparation for shaving and subsequent operations on the optical fibres thus revealed.

CLAIMS:

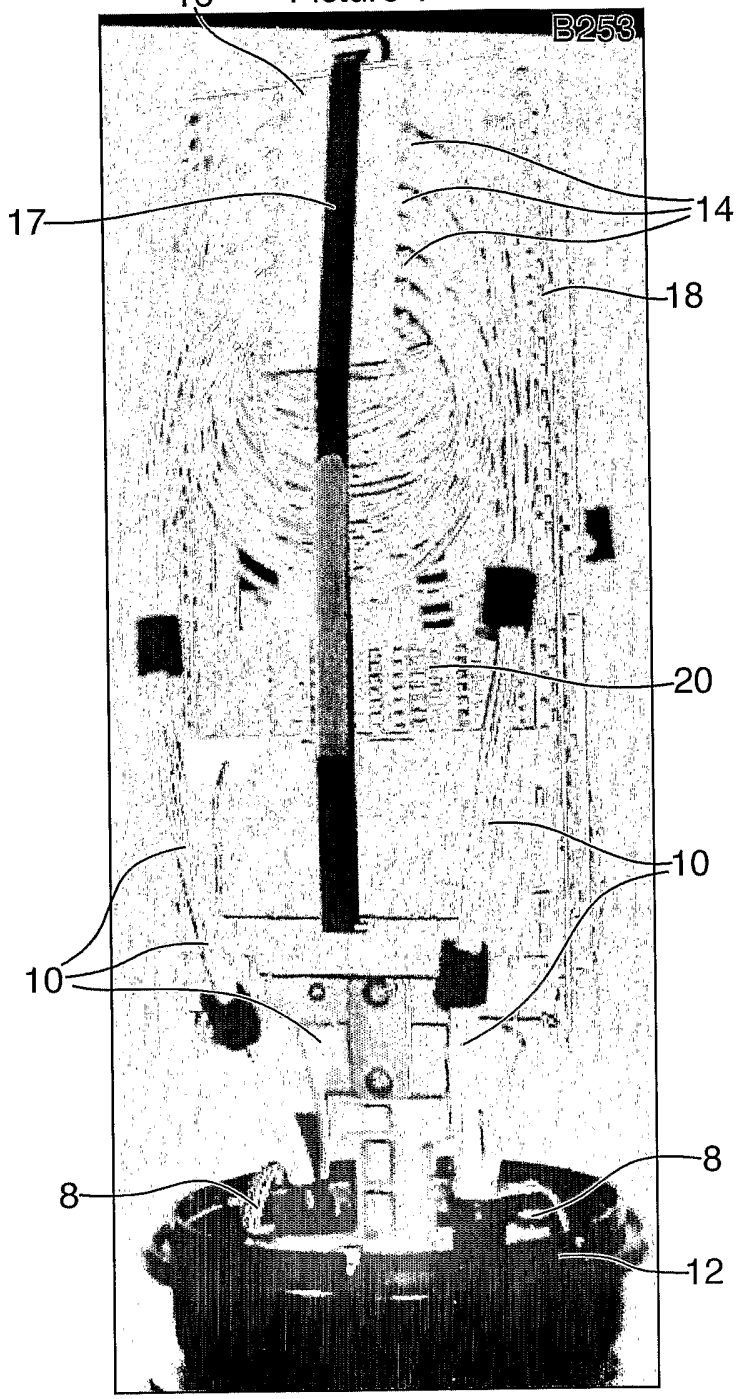
1. A loose tube organiser (16) for use in conjunction with a portion of an optical fibre cable from which the cable sheath has been stripped to expose loose tubes (10) extending within the cable, the loose tube organiser comprising a number of interconnected retaining members (14), each retaining member being capable of releasably holding loops (11) of one of the exposed loose tubes separately from loops (11) of the other loose tubes respectively held by the other retaining members in use.

2. An optical fibre splice enclosure, fibre rack, shelf, or box, in association with a loose tube organiser according to claim 1, either in the form of a kit for assembly at time of installation, or preferably with the loose tube organiser attached to other components of, on, or in, the enclosure, rack, shelf, or box.

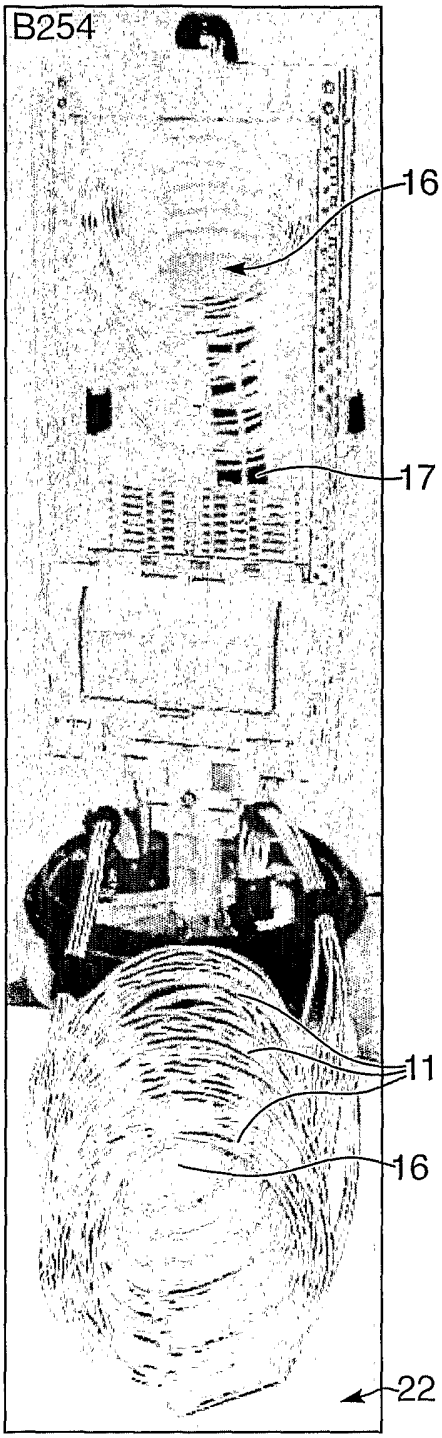
3. A splice enclosure according to claim 2, wherein the loose tube organiser is releasably attached to components to be enclosed by the enclosure, the loose tube organiser in use retaining the loops of loose tubes awaiting shaving in the same enclosure as the optical fibres already revealed by shaving of one or more other loose tubes.

4. A splice enclosure according to claim 2, wherein the loose tube organiser is releasably attached to a structure (18) supporting fibre organiser trays and other components which fits within the enclosure housing.

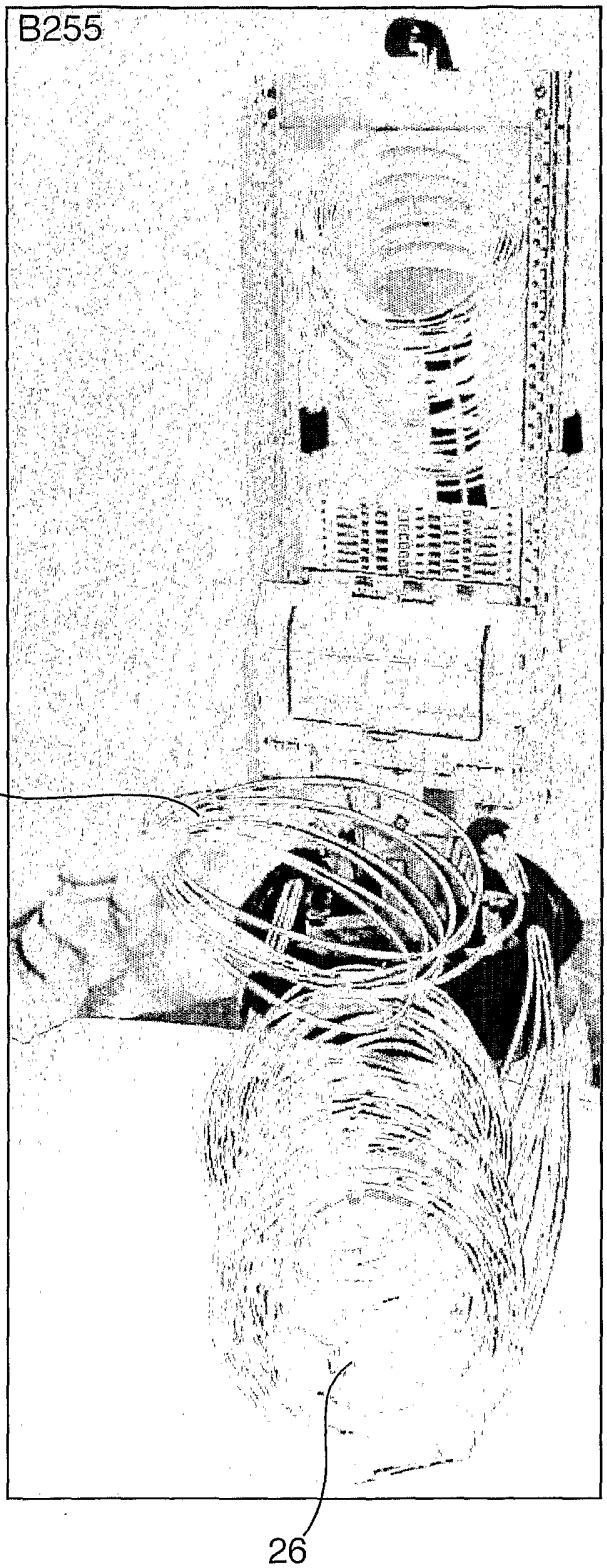
Picture 1



Picture 2



Picture 3



INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 G02B6/44

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 G02B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2002/106177 A1 (FLORES ALFRED E ET AL) 8 August 2002 (2002-08-08) abstract; figure 9 paragraph '0067!	1-4
X	EP 1 293 808 A (MITSUBISHI ELECTRIC CORP) 19 March 2003 (2003-03-19) abstract; figure 6	1-3
X	US 5 625 737 A (SAITO MASAMI) 29 April 1997 (1997-04-29) abstract; figures 2-4 column 5, lines 6-15	1,2
X	WO 96/38752 A (WHITAKER CORP) 5 December 1996 (1996-12-05) abstract; figure 7 page 1, lines 1-12	1-3

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

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"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
23 August 2004	30/08/2004

Name and mailing address of the ISA	Authorized officer
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INTERNATIONAL SEARCH REPORT

Information on patent family members

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