

CASSETTE FOR HOUSING OPTICAL CABLE JOINTS

This invention relates to cassettes for housing joints between optical cables each cable comprising a multiplicity of optical fibres.

It is the general practice to house protected splices or joints between optical fibres of two optical cables in a plurality of separately formed cassettes or other containers which are assembled together and housed in an overall joint enclosure into which the optical cables are fed, all such containers hereinafter, for convenience, being included in the generic term "cassette". Each cassette usually houses a plurality of protected optical fibre splices or joints and an excess length of each optical fibre of each splice or joint to provide for any necessity to re-splice or re-joint the optical fibres of any splice or joint which develops a fault.

By the expression "protected optical fibre splice or joint" is meant an optical fibre splice or joint which is surrounded by or enclosed within individual means for providing mechanical protection for the splice or joint.

To provide for ready access to any protected optical fibre splice or joint housed within a cassette, it is common practice to dispose the plurality of protected optical fibre splices or joints side-by-side in channels defined by a plurality of transversely spaced, longitudinally extending walls upstanding from an internal surface of the cassette.

Usually each protected optical fibre splice or joint is retained in a channel bounded by adjacent transversely spaced, longitudinally extending upstanding walls by a local deposit of adhesive or by a strip of self-adhesive tape or other separately formed flexible securing means extending transversely across the plurality of protected optical fibre splices or joints.

It is an object of the present invention to provide, for use in an optical cable joint enclosure, an improved cassette for housing a plurality of protected optical fibre splices or joints, which improved cassette is of such a construction that any one or more than one of a plurality of protected optical fibre splices or joints housed in the cassette can be readily removed as required without disturbing the other protected splices or joints housed in the cassette.

According to the invention, in the improved cassette at least one of the adjacent transversely spaced, longitudinally extending upstanding walls bounding each channel has intermediate of its ends and integral with the wall at least one resilient tongue which protrudes into the channel and is adapted to press a protected optical fibre splice or joint disposed in the channel against the opposite boundary wall of the channel to detachably secure the protected optical fibre splice or joint therein.

Preferably, at least one of the boundary walls of each channel intermediate of its ends has at least two such resilient tongues at longitudinally spaced positions along the length of the wall.

The or each resilient tongue integral with one or each boundary wall of each channel preferably protrudes into the channel at an angle to the longitudinal axis of the channel lying in the range 10° to 40° , e.g. 25° and, preferably also, is of such a length that it is adapted to press against the opposite boundary wall of the channel a protected optical fibre splice or joint having any diameter lying within a limited range of diameters differing from one another.

The plurality of transversely spaced, longitudinally extending boundary walls upstanding from an internal surface of the cassette may be integral with said internal surface of the cassette or may be integral with an insert which is separately formed with respect to the cassette and which is detachably or permanently secured to said internal surface of the cassette.

Each of the plurality of upstanding boundary walls of the channels may be longitudinally continuous or longitudinally discontinuous. Where a boundary wall is longitudinally continuous, the or each resilient tongue of the wall will not extend to the full depth of the channel but will be integral with an upper part of the wall; where a boundary wall is longitudinally

discontinuous, the or each resilient tongue of the wall may extend to the full depth of the channel but over the length of the tongue will be separate with respect to said internal surface of the cassette, or of the separately formed insert secured to said internal surface of the cassette, to provide for resilient flexing of the tongue as required.

Preferably, the improved cassette comprises a substantially flat two-part container comprising a shallow tray and a separately formed lid which can be detachably secured to the tray, the boundary walls of the plurality of channels upstanding from the internal surface of the base of the tray.

The upstanding boundary walls and the cassette or separately formed insert of which they form integral parts preferably are made of a rigid plastics material, a modified polyphenylene oxide resin such as that sold under the trade name "Noryl" being especially suitable.

The invention is further illustrated by a description, by way of example, of a preferred flat two-part cassette for housing a plurality of protected optical fibre splices with reference to the accompanying drawings, in which:-

Figure 1 is a plan view of the internal surface of the shallow tray of the two-part cassette;

Figure 2 is an end view of the shallow tray;

Figures 3 and 4, respectively, are transverse cross-sectional views of the shallow tray taken on the lines III-III and IV-IV in Figure 1;

Figure 5 is a plan view of the internal surface of the separately formed lid of the two-part cassette, and Figure 6 is an end view of the lid.

Referring to Figures 1 to 4 of the drawings, the shallow tray 1 of the preferred two-part cassette is a substantially flat rectangular-shaped moulding of modified polyphenylene oxide resin having upstanding from the internal surface of its base and inwardly spaced from each of its longer side edges a side wall 2 which extends throughout the length of the tray. At each of the four corners of the tray 1, short transversely spaced walls 3, 4 upstanding from the internal surface of the base of the tray define open-ended passages 5 through which optical fibres can pass into and out of the cassette. At each end of the tray 1, the walls 4 are integral with opposite ends of a longitudinally discontinuous curved wall 6 upstanding from the internal surface of the base of the tray.

Transversely spaced from and extending alongside an intermediate part of each of the side walls 2 of the tray 1 is a group of transversely spaced, longitudinally extending boundary walls 7 upstanding from the internal surface of the base of the tray, adjacent walls of each of the two groups defining channels 8 in which protected

optical fibre splices or joints (not shown) can be disposed side-by-side. Each wall 7 of each group, except the wall 7 nearest the associated side wall 2, is longitudinally discontinuous and has integral with the wall and intermediate of its ends two longitudinally spaced resilient tongues 9 each of which protrudes into one of the channels 8, or into the channel 8, which the wall in part bounds at an angle of approximately 25° to the longitudinal axis of the channel and is of such a length that it is adapted to press against the opposite boundary wall of the channel a protected optical fibre splice or joint having any diameter lying within a limited range of diameters differing from one another. Each of the resilient tongues 9 extends to the full depth of the channel 8 but over the length of the tongue is separate with respect to the internal surface of the base of the tray 1.

Each side wall 2 has intermediate of its ends and integral with its upper edge a flange 11 which overlies an aperture in the base of the tray 1 and each longitudinally discontinuous curved wall 6 has intermediate of its ends and integral with its uppermost edge two longitudinally spaced flanges 12 which overlie apertures in the base of the tray, each of which flanges 11 and 12 is adapted to retain on the base of the tray lengths of optical fibres housed in the cassette.

Longitudinally spaced along the central axis of the base of the tray 1 and upstanding from the internal

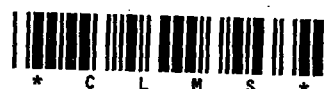
surface of the base are two tubular bosses 13, the purpose of which will be apparent from the following description of the separately formed lid of the preferred two-part cassette.

Turning to Figures 5 and 6, the separately formed lid 14 is a substantially flat rectangular-shaped moulding of the same plastics material as that of the tray 1. The lid 14 has two side walls 15 which depend from its longer side edges throughout the length of the lid and has, longitudinally spaced along its central axis, two tubular bosses 16 which depend from the internal surface of the lid. The depending bosses 16 of the lid are adapted to engage in the bores of the tubular bosses 13 of the tray 1 and the depending side walls 15 of the lid are adapted to engage the outer surfaces of the side walls 2 of the tray so that, when the tray and lid are assembled together, they are positively interlocked in such a way that relative movement between the tray and the lid in any direction in a plane parallel to the bases of the tray and lid is prevented.

In use, a plurality of flat two-part cassettes as described with reference to Figures 1 to 6 can be assembled together face-to-face and housed in an overall joint enclosure in which optical cables to be jointed together are fed.

CLAIMS:

1. For use in an optical cable joint enclosure, a cassette for housing a plurality of protected optical fibre splices or joints, which cassette has upstanding from an internal surface of the cassette a plurality of transversely spaced, longitudinally extending walls bounding a plurality of channels for the reception of protected optical fibre splices or joints, wherein at least one of the adjacent transversely spaced, longitudinally extending upstanding walls bounding each channel has intermediate of its ends and integral with the wall at least one resilient tongue which protrudes into the channel and is adapted to press a protected optical fibre splice or joint disposed in the channel against the opposite boundary wall of the channel to detachably secure the protected optical fibre splice or joint therein.
2. A cassette as claimed in Claim 1, wherein at least one of the boundary walls of each channel intermediate of its ends has at least two such resilient tongues at longitudinally spaced positions along the length of the wall.
3. A cassette as claimed in Claim 1 or 2, wherein the or each resilient tongue integral with one or each boundary wall of each channel protrudes into the channel at an angle to the longitudinal axis of the channel lying in the range 10° to 40°.



4. A cassette as claimed in any one of the preceding Claims, wherein the or each resilient tongue integral with one or each boundary wall of each channel is of such a length that it is adapted to press against the opposite boundary wall of the channel a protected optical fibre splice or joint having any diameter lying within a limited range of diameters differing from one another.

5. A cassette as claimed in any one of the preceding Claims, wherein the plurality of transversely spaced, longitudinally extending boundary walls upstanding from an internal surface of the cassette is integral with said internal surface of the cassette.

6. A cassette as claimed in any one of Claims 1 to 4, wherein the plurality of transversely spaced, longitudinally extending boundary walls upstanding from an internal surface of the cassette is integral with an insert which is separately formed with respect to the cassette and which is detachably or permanently secured to said internal surface of the cassette.

7. A cassette as claimed in any one of the preceding Claims, wherein each of the plurality of upstanding boundary walls of the channels is longitudinally continuous and wherein the or each resilient tongue of the wall does not extend to the full depth of the channel but is integral with an upper part of the wall.

8. A cassette as claimed in any one of Claims 1 to 6, wherein each of the plurality of upstanding boundary



walls of the channels is longitudinally discontinuous and wherein the or each resilient tongue of the wall extends to the full depth of the channel but over the length of the tongue is separate with respect to said internal surface of the cassette, or of the separately formed insert secured to said internal surface of the cassette.

9. A cassette as claimed in any one of the preceding Claims, wherein the cassette comprises a substantially flat two-part container comprising a tray and a separately formed lid which can be detachably secured to the tray, the boundary walls of the plurality of channels upstanding from the internal surface of the base of the tray.

10. A cassette as claimed in Claim 9, wherein the tray of the cassette is of rectangular shape and has transversely spaced from and extending alongside an intermediate part of each of its longer side edges a group of transversely spaced, longitudinally extending walls upstanding from the internal surface of the tray and bounding channels for reception of protected optical fibre splices or joints.

11. A cassette as claimed in Claim 9 or 10, wherein the tray of the cassette has at each of its ends a curved wall upstanding from the internal surface of the base of the tray.

12. A cassette as claimed in any of Claims 9 to 11, wherein the separately formed lid is adapted to interlock with the tray in such a way that



11.

relative movement between the tray and the lid in any direction in a plane parallel to the bases of the tray and lid is prevented.

13. A cassette as claimed in any one of the preceding Claims, wherein the upstanding boundary walls and the cassette or separately formed insert of which they form integral parts are made of a rigid plastics material.

14. A cassette as claimed in claim 1 substantially as hereinbefore described with reference to and as shown in the accompanying drawings.



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