United States Patent	12384598
Kind Code	B2
Date of Patent	August 12, 2025
Inventor(s)	Ryono; Yuta et al.

Housing case for fusion splicer and fusion splicer set

Abstract

A housing case for a fusion splicer is a housing case for housing the fusion splicer for an optical fiber. The housing case for a fusion splicer includes a case main body including a first side wall, and a lid body attached to the case main body to be openable and closable. The lid body includes a second side wall configured to match the first side wall when closed. At least one of the first side wall and the second side wall includes an insertion portion configured for a cable extending from the inside of the housing case to the outside thereof to be inserted through the insertion portion in a state where the lid body is closed with respect to the case main body.

Inventors: **Ryono; Yuta (Yokohama, JP), Joko; Kazufumi (Yokohama, JP), Sasaki; Tomoyoshi (Yokohama, JP), Sato; Ryuichiro (Yokohama, JP)**

Applicant: **Sumitomo Electric Optifrontier Co., Ltd.** (Yokohama, JP)

Family ID: **1000008751658**

Assignee: **Sumitomo Electric Optifrontier Co., Ltd. (Kanagawa, JP)**

Appl. No.: **18/248245**

Filed (or PCT Filed): **October 12, 2021**

PCT No.: **PCT/JP2021/037770**

PCT Pub. No.: **WO2022/080382**

PCT Pub. Date: April 21, 2022

Prior Publication Data

Document Identifier	Publication Date
US 20230373686 A1	Nov. 23, 2023

Foreign Application Priority Data

Publication Classification

Int. Cl.: **B65D85/38** (20060101); **B65D1/34** (20060101); **B65D25/00** (20060101); **B65D25/54** (20060101); **B65D43/16** (20060101); **B65D77/04** (20060101); B65D25/28 (20060101); G02B6/255 (20060101)

U.S. Cl.:

CPC **B65D25/005** (20130101); **B65D1/34** (20130101); **B65D25/54** (20130101); **B65D43/16** (20130101); **B65D77/046** (20130101); **B65D85/38** (20130101); B65D25/2841 (20130101); B65D2251/1058 (20130101); B65D2543/00194 (20130101); B65D2543/00351 (20130101); G02B6/2553 (20130101)

Field of Classification Search

CPC: B65D (1/34); B65D (25/54); B65D (77/046); B65D (85/38); B65D (25/2841); B65D (2543/00194); B65D (2543/00351); G02B (6/2553)

USPC: 206/349; 385/96

References Cited

U.S. PATENT DOCUMENTS

Patent No.	Issued Date	Patentee Name	U.S. Cl.	CPC
5386922	12/1994	Jordan	220/4.27	B65D 77/0486
5680932	12/1996	Dickinson	220/523	B25H 3/023
7693385	12/2009	Trotman et al.	N/A	N/A
9122010	12/2014	Koinkar	N/A	G02B 6/46
2013/0284377	12/2012	Takayanagi	156/433	G02B 6/2553
2013/0336621	12/2012	Zaxquarim et al.	N/A	N/A
2014/0110280	12/2013	Clark	206/217	B65D 43/162
2014/0157830	12/2013	Kawanishi	N/A	N/A

FOREIGN PATENT DOCUMENTS

Patent No.	Application Date	Country	CPC
2660634	12/2012	EP	N/A
2801848	12/2016	EP	N/A
H02-199412	12/1989	JP	N/A
H08-327848	12/1995	JP	N/A
2004-191597	12/2003	JP	N/A
2010-039002	12/2009	JP	N/A
2011-203534	12/2010	JP	N/A
2012-141357	12/2011	JP	N/A
2014-074796	12/2013	JP	N/A
2014-519616	12/2013	JP	N/A
2012/105825	12/2011	WO	N/A
2016/042671	12/2015	WO	N/A

OTHER PUBLICATIONS

International Search Report issued in Patent Application No. PCT/JP2021/037770 dated Jan. 11, 2022. cited by applicant

---

Primary Examiner: Reynolds; Steven A.

Attorney, Agent or Firm: MCDONALD HOPKINS LLC

Background/Summary

TECHNICAL FIELD

(1) The present disclosure relates to a housing case for a fusion splicer and a fusion splicer set. This application is based upon and claims the benefit of priority from Japanese Patent Application No. 2020-174183 filed on Oct. 15, 2020, the entire contents of which are incorporated herein by reference.

BACKGROUND ART

(2) Patent Literature 1 discloses an example of a housing case that houses a fusion splicer for an optical fiber. The housing case includes a case main body having a housing portion for housing the fusion splicer, and a lid body detachably attached to the case main body with hinges. Patent Literature 2 and 3 disclose other examples of housing cases.

CITATION LIST

Patent Literature

(3) [Patent Literature 1] Japanese Unexamined Patent Publication No. 2014-074796 [Patent Literature 2] Japanese Unexamined Patent Publication No. 2010-039002 [Patent Literature 3] PCT International Publication No. WO2016/042671

SUMMARY OF INVENTION

(4) An aspect of the present disclosure provides a housing case for a fusion splicer. The housing case for a fusion splicer is a housing case for housing the fusion splicer for an optical fiber. The housing case for a fusion splicer includes a case main body including a first side wall, and a lid body attached to the case main body to be openable and closable. The lid body includes a second side wall configured to match the first side wall when closed. At least one of the first side wall and the second side wall includes an insertion portion configured for a cable extending from the inside of the housing case to the outside thereof to be inserted through the insertion portion in a state where the lid body is closed with respect to the case main body.

(5) Another aspect of the present disclosure provides a fusion splicer set. The fusion splicer set includes the above housing case, and a fusion splicer for an optical fiber housed in the housing case.

Description

BRIEF DESCRIPTION OF DRAWINGS

(1) FIG. **1** is a perspective view illustrating a housing case according to an embodiment.

(2) FIG. **2** is a perspective view illustrating a fusion splicer set that includes the housing case with a lid body opened with respect to a case main body.

(3) FIG. **3** is a perspective view illustrating the housing case with various devices such as a fusion splicer housed therein omitted from illustration.

(4) FIG. **4** is an enlarged view of a region A, which is a part of the case main body surrounded by a

dashed line illustrated in FIG. **2**, with a sealing member omitted from illustration.
(5) FIG. **5** is an enlarged view of the region A, which is a part of the case main body surrounded by a dashed line illustrated in FIG. **2**, with a sealing member illustrated.
(6) FIG. **6** is an enlarged view of a region B, which is a part of the lid body surrounded by a dashed line illustrated in FIG. **2**, with a sealing member omitted from illustration.
(7) FIG. **7** is an enlarged view of the region B, which is a part of the lid body surrounded by a dashed line illustrated in FIG. **2**, with a sealing member illustrated.
(8) FIG. **8** is a diagram illustrating a state in which a cable is sandwiched between two sealing members.
(9) FIG. **9** is a perspective view of a tray from a side of a first region.
(10) FIG. **10** is a perspective view of a tray from a side of a second region.
(11) FIG. **11** is a cross-sectional view of the housing case along line XI-XI illustrated in FIG. **2**.
(12) FIG. **12** is a perspective view illustrating a first body contact member.
(13) FIG. **13** is an enlarged view of a recess of the first body contact member and a protrusion of a locking member in a state in which the first body contact member is housed.
(14) FIG. **14** is a perspective view illustrating a second body contact member.
(15) FIG. **15** is a perspective view illustrating the tray with the first body contact member and the second body contact member unfolded.

DESCRIPTION OF EMBODIMENTS

Problems to be Solved by the Present Disclosure

(16) When power is supplied to a fusion splicer, the fusion splicer and the external power supply are connected through a power supply cable. When power is supplied to a fusion splicer housed in a housing case of the related art, it is necessary to leave a lid body in an opened state to prevent a power supply cable from being pinched between a case main body and the lid body and damaged. Thus, it is necessary to ensure a large arrangement space for the housing case when power is supplied to the fusion splicer. Therefore, there is a demand for a technique that allows the arrangement space of the housing case to be reduced when power is supplied to the fusion splicer.
(17) An object of the present disclosure is to provide a housing case that can reduce an arrangement space when power is supplied to a fusion splicer.

Effects of the Present Disclosure

(18) According to the aspect of the present disclosure, it is possible to reduce the arrangement space of the housing case when power is supplied to the fusion splicer.

DESCRIPTION OF EMBODIMENTS OF THE PRESENT DISCLOSURE

(19) First, contents of embodiments of the present disclosure will be listed and described. A housing case according to an embodiment of the present disclosure is a housing case for housing the fusion splicer for an optical fiber. The housing case for a fusion splicer includes a case main body including a first side wall and a lid body attached to the case main body to be openable and closable. The lid body includes a second side wall configured to match the first side wall when closed. At least one of the first side wall and the second side wall includes an insertion portion configured for a cable extending from the inside of the housing case to the outside thereof to be inserted through the insertion portion in a state where the lid body is closed with respect to the case main body.
(20) In this housing case, the insertion portion is provided, and the cable extending from the inside of the housing case to the outside is inserted through this insertion portion, and thus, even in a case where the lid body is closed with respect to the case main body, the cable is not pinched between the case main body and the lid body. As a result, according to this housing case, damage to the cable (for example, damage to the coating) due to the pinching is prevented. That is, in this housing case, power can be supplied to the fusion splicer with the lid body closed, and the arrangement space of the housing case can be reduced during power supply.
(21) As an embodiment, the first side wall may include a first edge portion, the second side wall

may include a second edge portion, and the first edge portion and the second edge portion may come into contact with each other when the lid body is closed with respect to the case main body. The insertion portion may include a case notch provided in at least one of the first edge portion and the second edge portion. According to the embodiment, since the insertion portion includes the case notch provided in the first edge portion of the first side wall or the second edge portion of the second side wall, the cable can be easily inserted through the insertion portion.

(22) As an embodiment, the housing case for a fusion splicer may further include a sealing member configured to seal a gap between the insertion portion and the cable in a state where the lid body is closed with respect to the case main body. According to this embodiment, water droplets, dust, or the like is prevented from entering the housing case through a gap between the insertion portion and the cable. As a result, failure of the fusion splicer housed in the housing case can be curbed.

(23) As an embodiment, the sealing member may be made of sponge rubber having a hardness of 20 or more and 40 or less. According to this embodiment, since the sealing member has appropriate elasticity, the sealing member comes into close contact with the surface of the cable. As a result, the gap between the insertion portion and the cable is more appropriately sealed, and the waterproofness or dustproofness of the housing case is improved.

(24) As an embodiment, the sealing member may be disposed such that the entire sealing member is located closer to the inside of the housing case than outermost peripheral surfaces of the first side wall and the second side wall. According to this embodiment, it is possible to prevent the sealing member from peeling off from the housing case due to external impact or the like.

(25) As an embodiment, the sealing member may include a first sealing member provided in the first edge portion and a second sealing member provided in the second edge portion. The first sealing member and the second sealing member may be located such that the cable is sandwiched therebetween in a thickness direction of the housing case when the lid body is closed. According to this embodiment, the sealing member can be easily disposed around the cable.

(26) As an embodiment, the housing case for a fusion splicer may further include a tray on which the fusion splicer is able to be placed. The tray may be able to be housed in the case main body such that the housing case is partitioned into an upper side housing space and a lower side housing space in a thickness direction of the housing case. According to this embodiment, tools such as devices and chemicals used for the fusion splicing work can be arranged and housed in the housing case. That is, the internal space of the housing case can be effectively utilized.

(27) As an embodiment, at least one tray notch that connects the upper side housing space and the lower side housing space to each other may be provided in an outer peripheral edge portion of the tray. According to this embodiment, the devices disposed in the upper side housing space and the lower side housing space can be cable-connected via the tray notch. That is, the degree of freedom in arranging cable-connected devices is improved.

(28) As an embodiment, at least one of the case main body and the lid body may include a window portion made of a transparent member. The window portion may be formed at a position at which a charging status of the fusion splicer charged through the cable is able to be visually recognized. According to this embodiment, the power supply status of the fusion splicer can be easily checked through the window portion without opening the lid body.

(29) A fusion splicer set according to an embodiment of the present disclosure includes the housing case according to any one of the embodiments described above and a fusion splicer for an optical fiber housed in the housing case. According to this fusion splicer set, it is possible to obtain the same effect as each embodiment of the housing case for a fusion splicer described above.

Details of Embodiment of the Present Disclosure

(30) An embodiment of the present disclosure will be described in detail below with reference to the accompanying drawings. The present invention is not limited to this example, but is defined by the scope of the claims, and is intended to include meanings equivalent to the scope of the claims and all modifications within the scope. In the following description, the same reference signs will

be used for the same elements or elements having the same functions, and redundant description will be omitted.

(31) A housing case **1** and a fusion splicer set **110** according to the embodiment will be described with reference to FIGS. **1** to **3**. FIG. **1** is a perspective view illustrating the housing case **1** according to the embodiment. FIG. **2** is a perspective view illustrating the fusion splicer set **110** that includes the housing case **1** with a lid body **30** opened with respect to a case main body **10**. FIG. **3** is a perspective view illustrating the housing case **1** with various devices such as a fusion splicer **100** housed therein omitted from illustration. Hereinafter, in a state where the lid body **30** is closed with respect to the case main body **10** (a state illustrated in FIG. **1**), a direction along a direction from the case main body **10** toward the lid body **30** (a vertical direction in FIG. **1**) is referred to as a thickness direction of the housing case **1**.

(32) First, the fusion splicer **100** housed in the housing case **1** will be described with reference to FIG. **2**. The fusion splicer **100** is a device for fusion splicing optical fibers. A cover **101** and a heater **102** are provided in the upper portion of the fusion splicer **100**. The cover **101** is attached to openably and closably cover a fusion portion (not illustrated) for fusion splicing the optical fibers and prevents wind from entering the fusion portion. The heater **102** is used to heat and shrink a fiber reinforcing sleeve that is put on a fusion splicing portion between the optical fibers fused by the fusion portion. Further, the fusion splicer **100** includes a monitor **103** that displays a fusion splicing status between the optical fibers which are imaged by a camera (not illustrated) disposed inside. In the fusion splicer set **110**, the fusion splicer **100**, other fusion splicing tools, equipment, and the like are housed in the housing case **1**.

(33) The housing case **1** is a case for housing the fusion splicer **100** for an optical fiber. The housing case **1** includes the case main body **10**, the lid body **30**, and a tray **40**. As illustrated in FIG. **2**, the lid body **30** is attached to the case main body **10** with hinges **2** to be openable and closable. Since the housing case **1** has the hinges **2**, it is possible to transition the lid body **30** from a closed state of the lid body **30** illustrated in FIG. **1** to an opened state of the lid body **30** illustrated in FIG. **2**. It is also possible to transition the lid body **30** from the opened state to the closed state. In the present embodiment, the lid body **30** is configured to open approximately 180 degrees with respect to the case main body **10**, but the angle at which the lid body **30** can be opened is not limited. For example, the lid body **30** may be configured to open 90 degrees with respect to the case main body **10**. Further, the lid body **30** may be separable from the housing case **1**.

(34) The housing case **1** has a ring-shaped handle **3**. The handle **3** is attached to a side of the case main body **10** opposite to a side on which the hinges **2** are located. An operator can easily carry the housing case **1** by gripping the handle **3**. The handle **3** may be provided in the lid body **30**. The housing case **1** has a pair of locking members **4**. Each locking member **4** is constituted by a pair of metal fittings provided in the case main body **10** and the lid body **30**. The lid body **30** is maintained in a closed state by engaging the pair of metal fittings with each other, and unintended opening and closing of the lid body **30** is prevented.

(35) As illustrated in FIG. **1**, the housing case **1** includes an insertion portion **5** configured for a cable extending from the inside of the housing case **1** to the outside thereof to be inserted through the insertion portion **5** in a state where the lid body **30** is closed with respect to the case main body **10**. The cable may be, for example, a power supply cable used to supply power to the fusion splicer **100**. When the cable is a power supply cable, one end of the cable is connected to the fusion splicer **100** and the other end is connected to an external power source. A detailed configuration of the insertion portion **5** will be described later. In the following description, a side on which the handle **3** is located is referred to as a front side of the housing case **1**, and a side on which the hinges **2** are located is referred to as a rear side. In addition, in the thickness direction of the housing case **1**, a side on which the lid body **30** is located is referred to as an upper side of the housing case **1**, and a side on which the case main body **10** is located is referred to as a lower side.

(36) As illustrated in FIG. **3**, the case main body **10** is a bottomed box-shaped member with an

open top. The case main body **10** has a bottom plate **11** and a first peripheral wall **12** (a first side wall). The bottom plate **11** is a substantially rectangular plate-like member in a plan view and is located at the bottom portion of the case main body **10**. The inner side surface of the bottom plate **11** is provided with an uneven portion **11***a* that can be used for arranging the devices housed in the case main body **10**. The inner side surface of the bottom plate **11** may be a flat surface without the uneven portion **11***a*, or may be provided with a partition plate having a higher height than the uneven portion **11***a*.

(37) The first peripheral wall **12** is a wall-shaped member rising from the edge portion of the bottom plate **11**. The first peripheral wall **12** includes a front side peripheral wall **12***a* provided with the handle **3**, a rear side peripheral wall **12***b* located on a side opposite to the front side peripheral wall **12***a* and provided with the hinges **2**, and a left side peripheral wall **12***c* and a right side peripheral wall **12***d* which connect the front side peripheral wall **12***a* and the rear side peripheral wall **12***b* to each other. The left side peripheral wall **12***c* is a wall-shaped member located on the left side of the case main body **10** when the case main body is viewed from the front side peripheral wall **12***a*, and the right side peripheral wall **12***d* is a wall-shaped member located on the right side of the case main body **10** when the case main body **10** is viewed from the front side peripheral wall **12***a*. The widths of the front side peripheral wall **12***a* and the rear side peripheral wall **12***b* are slightly larger than the widths of the left side peripheral wall **12***c* and the right side peripheral wall **12***d*. Therefore, the overall shape of the case main body **10** is such that the width in a left-right direction is larger than the width in a front-rear direction. The shape of the case main body **10** is not limited and may be a shape having equal widths in the front-rear direction and in the left-right direction.

(38) The bottom plate **11** and the first peripheral wall **12** may be formed of a resin such as polypropylene or polyethylene. The bottom plate **11** and the lower portion of the first peripheral wall **12** are constituted by stacking members formed of the same material or different materials and are thicker than the upper portion of the first peripheral wall **12**. As a result, the fusion splicer **100** can be more reliably protected from impact applied to the lower portion of the housing case **1** when the housing case **1** is dropped. Moreover, due to the difference in thickness, a step surface **20** is provided at the boundary portion between the upper portion and the lower portion of the first peripheral wall **12**. The step surface **20** is continuously provided along the inner circumference of the first peripheral wall **12**. The edge portion of a tray **40** (see FIG. **2**) is placed on the step surface **20**.

(39) The lid body **30** is a member that closes an opening of the case main body **10** and has a top plate **31** and a second peripheral wall **32** (a second side wall). The top plate **31** is a substantially rectangular plate-like member in a plan view and is located at the upper portion of the lid body **30**. As illustrated in FIG. **2**, the inner side surface of the top plate **31** is provided with an uneven portion **31***a* that matches the shape of the fusion splicer **100**. The uneven portion **31***a* covers the upper portion of the fusion splicer **100** in a state where the lid body **30** is closed. This prevents the fusion splicer **100** from being displaced during transportation of the housing case **1**. The top plate **31** may have a flat surface without the uneven portion **31***a*.

(40) The second peripheral wall **32** is a wall-shaped member rising from the edge portion of the top plate **31**. The second peripheral wall **32** has a front side peripheral wall **32***a*, a rear side peripheral wall **32***b*, a left side peripheral wall **32***c*, and a right side peripheral wall **32***d*. In a state where the lid body **30** is closed, the front side peripheral wall **32***a* is a wall-shaped member located on the front side of the housing case **1**, and the rear side peripheral wall **32***b* is a wall-shaped member located on the rear side of the housing case **1**. Further, the left side peripheral wall **32***c* is a wall-shaped member located on the left side of the housing case **1**, and the right side peripheral wall **32***d* is a wall-shaped member located on the right side of the housing case **1**. The widths of the front side peripheral wall **32***a*, the rear side peripheral wall **32***b*, the left side peripheral wall **32***c*, and the right side peripheral wall **32***d* are designed to be approximately the same as the widths of the front

side peripheral wall **12***a*, the rear side peripheral wall **12***b*, the left side peripheral wall **12***c*, and the right side peripheral wall **12***d* of the case main body **10**, respectively.

(41) The top plate **31** and the second peripheral wall **32** may be formed of a resin such as polypropylene or polyethylene. The top plate **31** and the second peripheral wall **32** are constituted by stacking members formed of the same material or different materials and are thicker than the upper portion of the first peripheral wall **12** of the case main body **10**. As a result, the fusion splicer **100** housed inside the housing case **1** can be more reliably protected from external impact.

(42) The top plate **31** or the second peripheral wall **32** has a window portion W made of a transparent member that transmits visible light. The window portion W may be formed by fitting a transparent resin member into an opening portion formed in the top plate **31** or the second peripheral wall **32**, for example. The window portion W may be provided at a position at which a charging status of the fusion splicer **100** is able to be visually recognized. For example, in a case where a lamp indicating the charging status is provided in the right side surface of the fusion splicer **100**, the window portion W may be provided in a portion of the top plate **31** near the right side peripheral wall **32***d* or in the right side peripheral wall **32***d*. In the present embodiment, the window portion W is provided in the right side peripheral wall **32***d* of the second peripheral wall **32**. The window portion W may be provided in the first peripheral wall **12** of the case main body **10** instead of the lid body **30**.

(43) As illustrated in FIG. **2**, the first peripheral wall **12** of the case main body **10** has a first edge portion **13**, and the second peripheral wall **32** of the lid body **30** has a second edge portion **33**. The first edge portion **13** and the second edge portion **33** come into contact with each other when the lid body **30** is closed with respect to the case main body **10**. The first edge portion **13** has an annular shape that continuously extends along the upper end portion of the first peripheral wall **12**. The second edge portion **33** has an annular shape that extends continuously along the lower end portion of the second peripheral wall **32**, similarly to the first edge portion **13**. A portion of each of the first edge portion **13** and the second edge portion **33** to which the locking member **4** is attached is recessed inside the case main body **10**. When the lid body **30** is closed, as illustrated in FIG. **1**, the first edge portion **13** comes into contact with the second edge portion **33** over substantially the entire circumference of the annular shape. As a result, it is possible to prevent water droplets, dust, or the like from entering the housing case **1** through a gap between the case main body **10** and the lid body **30**.

(44) As described above, the housing case **1** includes the insertion portion **5** (see FIG. **1**) through which the cable extending from the inside of the case main body **10** to the outside thereof can be inserted in a state where the lid body **30** is closed. The insertion portion **5** is constituted by notches **18** and **38** (see FIGS. **4** and **6**) provided in the first edge portion **13** and the second edge portion **33**, respectively. Each of the notches **18** and **38** constitutes a case notch. The notch **18** constitutes a first case notch, and the notch **38** constitutes a second case notch. The notch **18** is provided in the first edge portion **13** of the right side peripheral wall **12***d*, and the notch **38** is provided in the second edge portion **33** of the right side peripheral wall **32***d*. At least a part of the notch **18** overlaps the notch **38** in the thickness direction of the first peripheral wall **12** and the second peripheral wall **32** when the lid body **30** is closed. In the notches **18** and **38**, the first edge portion **13** does not come into contact with the second edge portion **33**, and an opening portion is formed.

(45) A detailed configuration of the notches **18** and **38** will be described with reference to FIGS. **4** to **7**. FIGS. **4** and **5** are enlarged views of a region A which is a part of the case main body **10** (a portion of the first edge portion **13** in which the notch **18** is provided) surrounded by a dashed line illustrated in FIG. **2**. For convenience of explanation, illustration of a sealing member **19** is omitted in FIG. **4**, and the sealing member **19** is illustrated in FIG. **5**. FIGS. **6** and **7** are enlarged views of a region B which is a part of the lid body **30** (a portion of the second edge portion **33** in which the notch **38** is provided) surrounded by a dashed line illustrated in FIG. **2**. For convenience of explanation, illustration of a sealing member **39** is omitted in FIG. **6**, and the sealing member **39** is

illustrated in FIG. **7**.

(46) The first edge portion **13** has an end surface **14** (a first end surface) and a first thin wall **15**, as illustrated in FIG. **4**. The end surface **14** is a flat surface provided along the first edge portion **13**. The first thin wall **15** is a wall-shaped member standing on the end surface **14**, and the majority thereof is provided along the first edge portion **13**. The first thin wall **15** partially has a depression portion **15**A that is recessed inside the case main body **10**. The depression portion **15**A includes a pair of lateral wall portions **16** (first lateral wall portions) and an inner wall portion **17**. Each lateral wall portion **16** extends toward the inside of the case main body **10** along a direction intersecting with (orthogonal to; in the present embodiment) an extending direction of the first edge portion **13**. The pair of lateral wall portions **16** are provided facing each other. Each lateral wall portion **16** has an upper surface **16***a* at its upper end. The height (the distance from the end surface **14** to the upper surface **16***a*) of each lateral wall portion **16** is equal to the height (the distance from the end surface **14** to an upper surface **15***a*) of a portion of the first thin wall **15** in which the depression portion **15**A is not provided (hereinafter referred to as a non-depressed portion).

(47) The inner wall portion **17** is located closer to the inside of the case main body **10** than the non-depressed portion of the first thin wall **15**. The inner wall portion **17** is provided along a facing direction of the pair of lateral wall portions **16**, that is, along the extending direction of the first edge portion **13**, and both end portions thereof are connected to the end portions of the lateral wall portions **16**. The inner wall portion **17** has an upper surface **17***a* at its upper end. The notch **18** is provided in the central portion of the inner wall portion **17**. The notch **18** is a portion through which the cable extending from the inside of the case main body to the outside thereof is inserted. The notch **18** is formed in a U shape and has a gently curved bottom surface **18***a*. Further, a connecting portion between the end portion of the notch **18** and the upper surface **17***a* is smoothly connected as if a corner is removed. As a result, when the cable is disposed in the notch **18**, even in a case where the cable comes into contact with the connecting portion, the coating of the cable is less likely to be damaged. The width of the notch **18** in the extending direction of the inner wall portion **17** gradually decreases from the upper surface **17***a* toward the end surface **14**. The shape of the notch **18** is not limited to the shape described above and may be formed in a V shape with a sharp bottom portion, for example.

(48) The height of a portion of the inner wall portion **17** close to the notch **18** (the distance from the end surface **14** to the upper surface **17***a*) is larger than that of each of both end portions of the inner wall portion **17** connected to the lateral wall portion **16**. As a result, it is possible to prevent the cable inserted through the notch **18** from slipping out of the notch **18**. In addition, the inner wall portion **17** is configured such that the thickness thereof decreases from the end surface **14** toward the upper surface **17***a*.

(49) The sealing member **19** (a first sealing member) is disposed on the end surface **14** as illustrated in FIG. **5**. The sealing member **19** seals a gap between the notches **18** and **38** and the cable inserted through the notches **18** and **38** in cooperation with the sealing member **39** (see FIG. **7**) of the lid body **30**. The sealing member **19** is formed of a resilient material. The material of the sealing member **19** may be silicone rubber, a thermo plastic elastomer (TPE), or a microcell polymer sheet, for example. The hardness of the sealing member **19** is preferably 20 or more and 40 or less, and more preferably 30, for example. The hardness of the sealing member **19** is a value measured on the basis of JIS K 6253.

(50) The sealing member **19** is formed in a rectangular parallelepiped shape and disposed such that its longitudinal direction is along the extending direction of the first edge portion **13**. The sealing member **19** has a pair of end surfaces **19***a* opposing each other in the longitudinal direction. In the present embodiment, each end surface **19***a* is located slightly apart from a wall surface of the lateral wall portion **16**, and these gaps facilitate deformation of the sealing member **19** when the cable is sandwiched. Each end surface **19***a* may be in contact with the wall surface of the lateral wall portion **16** as long as it does not interfere with the holding of the cable by the sealing member **19**.

The sealing member **19** has four side surfaces connecting the pair of end surfaces **19***a* to each other. Of the four side surfaces, a surface (not illustrated) in contact with the end surface **14** is referred to as a lower side surface, and a surface opposing the lower side surface is referred to as an upper side surface **19***b*. Further, side surfaces connecting the lower side surface and the upper side surface **19***b* to each other are referred to as an outer side surface **19***c* and an inner side surface **19***d*. The outer side surface **19***c* and the inner side surface **19***d* are opposed to each other. The outer side surface **19***c* is located closer to the outside of the case main body **10** than the inner side surface **19***d*.

(51) The lower side surface adheres to the end surface **14** by an adhesive. As a result, the sealing member **19** is fixed to the first edge portion **13**. A fixing method of the sealing member **19** is not limited. For example, in a case where the end surface **14** has a protrusion, the sealing member **19** may be fixed by inserting the protrusion into the lower side surface. The upper side surface **19***b* is located further apart from the end surface **14** than the upper surface **16***a*. That is, the thickness of the sealing member **19** (the width from the lower side surface to the upper side surface **19***b*) is greater than the height of the lateral wall portion **16**. Further, the upper side surface **19***b* is located further apart from the end surface **14** than the bottom surface **18***a* (see FIG. **4**) of the notch **18**. That is, at least a part of the sealing member **19** overlaps the notch **18** when the sealing member **19** is viewed from the outer side surface **19***c*. As a result, when the cable is inserted through the notch **18**, the cable is disposed to sink slightly into the interior of the sealing member **19**.

(52) The outer side surface **19***c* is located closer to the outside of the case main body **10** than the wall surface of the non-depressed portion of the first thin wall **15**. However, the outer side surface **19***c* may be located closer to the inside of the case main body **10** than the wall surface of the non-depressed portion of the first thin wall **15**, that is, may be located at the depression portion **15**A of the first thin wall **15**. The inner side surface **19***d* is located slightly apart from the wall surface of the inner wall portion **17**. However, the inner side surface **19***d* may be located to be in contact with the wall surface of the inner wall portion **17**. The shape of the sealing member **19** is not limited to the shape described above. The sealing member **19** may have, for example, a cuboid shape. Further, the upper side surface **19***b* of the sealing member **19** may be provided with a groove portion extending along a direction connecting the outer side surface **19***c* and the inner side surface **19***d* to each other, and the cable may be disposed in the groove portion.

(53) The second edge portion **33** has an end surface **34** (a second end surface) and a second thin wall **35**, as illustrated in FIG. **6**. The end surface **34** is a flat surface provided along the second edge portion **33**. The second thin wall **35** is a wall-shaped member standing on the end surface **34**, and the majority thereof is provided along the second edge portion **33**. The second thin wall **35** has a pair of lateral wall portions **36** (second lateral wall portions) and an outer wall portion **37**. Each lateral wall portion **36** extends toward the inside of the lid body **30** along a direction intersecting with (orthogonal to; in the present embodiment) an extending direction of the second edge portion **33**. The pair of lateral wall portions **36** are provided facing each other. Each lateral wall portion **36** has an upper surface **36***a* at its upper end. The height of each lateral wall portion **36** (the distance from the end surface **34** to the upper surface **36***a*) is equal to the height of a portion of the second thin wall **35** extending along the second edge portion **33** (the distance from the end surface **34** to an upper surface **35***a*). The outer wall portion **37** is provided along the second edge portion **33**.

(54) The notch **38** is provided in a portion of the outer wall portion **37** corresponding to a region where the pair of lateral wall portions **36** face each other (a portion of the outer wall portion **37** located between the pair of lateral wall portions **36**). The notch **38** is a portion through which the cable extending from the inside of the case main body **10** to the outside thereof is inserted. The notch **38** is formed in a U shape and has a gently curved bottom surface **38***a*. Further, a connecting portion between the end portion of the notch **38** and the upper surface **35***a* is smoothly connected as if a corner is removed. As a result, when the cable is disposed in the notch **38**, even in a case where the cable comes into contact with the connecting portion, the coating of the cable is less likely to be damaged. The width of the notch **38** in the extending direction of the second edge portion **33**

gradually decreases from the upper surface **35***a* toward the end surface **34**. The shape of the notch **38** is not limited to the shape described above and may be formed in a V shape with a sharp bottom portion, for example.

(55) The sealing member **39** (a second sealing member) is disposed on the end surface **34** as illustrated in FIG. **7**. The sealing member **39** seals a gap between the notches **18** and **38** and the cable inserted through the notches **18** and **38** in cooperation with the sealing member **19** (see FIG. **5**) of the case main body **10** when the lid body **30** is closed with respect to the case main body **10**. The sealing member **39** is formed of a resilient material, similar to the sealing member **19** described above. The material of the sealing member **39** may be silicone rubber, a thermo plastic elastomer (TPE), or a microcell polymer sheet, for example. The hardness of the sealing member **39** is preferably 20 or more and 40 or less, and more preferably 30, for example. The hardness measurement of the sealing member **39** is performed on the basis of the same standard as the hardness measurement of the sealing member **19** described above.

(56) The sealing member **39** is formed in a rectangular parallelepiped shape and disposed such that its longitudinal direction is along the extending direction of the second edge portion **33**. The sealing member **39** has a pair of end surfaces **39***a* opposing each other in the longitudinal direction. In the present embodiment, each end surface **39***a* is slightly apart from the wall surface of the lateral wall portion **36**, but may be in contact with the wall surface of the lateral wall portion **36**. The sealing member **39** has four side surfaces connecting the pair of end surfaces **39***a* to each other. Of the four side surfaces, a surface (not illustrated) in contact with the end surface **34** (see FIG. **6**) is referred to as a lower side surface, and a surface opposing the lower side surface is referred to as an upper side surface **39***b*. Further, side surfaces connecting the lower side surface and the upper side surface **39***b* to each other are referred to as an outer side surface **39***c* and an inner side surface **39***d*. The outer side surface **39***c* and the inner side surface **39***d* are opposed to each other. The outer side surface **39***c* is located closer to the outside of the lid body than the inner side surface **39***d*.

(57) The lower side surface of the sealing member **39** adheres to the end surface **34** by an adhesive. As a result, the sealing member **39** is fixed to the second edge portion **33**. A fixing method of the sealing member **39** is not limited. For example, in a case where the end surface **34** has a protrusion, the sealing member **39** may be fixed by inserting the protrusion into the lower side surface. The upper side surface **39***b* is located further apart from the end surface **34** than the upper surface **36***a*. That is, the thickness of the sealing member **39** (the width from the lower side surface to the upper side surface **39***b*) is greater than the height of the lateral wall portion **36**. Further, the upper side surface **39***b* is located further apart from the end surface **34** than the bottom surface **38***a* of the notch **38**. That is, at least a part of the sealing member **39** overlaps the notch **38** when the sealing member **39** is viewed from the inner side surface **39***d*. When the cable is inserted through the notch **38**, the cable is disposed to sink slightly into the interior of the sealing member **39**.

(58) The outer side surface **39***c* is located slightly apart from the wall surface of the second thin wall **35** facing it. However, the outer side surface **39***c* may be located to be in contact with the wall surface. The inner side surface **39***d* is located closer to the inside of the lid body **30** than the end portion of each lateral wall portion **36**. However, the inner side surface **39***d* may be located closer to the outside of the lid body **30** than the end portion of each lateral wall portion **36**, that is, may be located within a region sandwiched between the pair of lateral wall portions **36**. The shape of the sealing member **39** is not limited to the shape described above. The sealing member **39** may have, for example, a cuboid shape. Further, the upper side surface **39***b* of the sealing member **39** may be provided with a groove portion extending along a direction connecting the outer side surface **39***c* and the inner side surface **39***d* to each other, and the cable may be disposed in the groove portion.

(59) FIG. **8** is a diagram illustrating a state in which the cable C is sandwiched between the sealing member **19** and the sealing member **39**. In FIG. **8**, illustration of components of the lid body **30** other than the sealing member **39** is omitted for convenience of explanation. The cable C may be a power supply cable used to supply power to the fusion splicer **100**. When the lid body **30** is closed

with the cable C inserted into the notch **18** of the case main body **10**, the sealing member **19** and the sealing member **39** come into contact with each other such that they overlap each other in the thickness direction of the case main body **10**, as illustrated in FIG. **8**. Specifically, the upper side surface **19***b* (see FIG. **5**) of the sealing member **19** and the upper side surface **39***b* (see FIG. **7**) of the sealing member **39** come into contact with each other. In a state where the lid body **30** is closed, the second thin wall **35** (see FIG. **7**) of the lid body **30** is located closer to the outside of the housing case **1** than the first thin wall **15** of the case main body **10** and the sealing members **19** and **39**. That is, the notch **18**, the sealing members **19** and **39**, and the notch **38** are located to be arranged in that order from the inside toward the outside of the housing case **1**. The outer side wall surface of the second thin wall **35** is the outermost peripheral surface of the first peripheral wall **12** and the second peripheral wall **32**.

(60) The cable C is sandwiched between the sealing member **19** and the sealing member **39**. The sealing member **19** and the sealing member **39** are formed of a resilient material as described above. Therefore, the sealing member **19** and the sealing member **39** are deformed according to the shape of the cable C and come into close contact with the coating of the cable C. The cable C extends from the inside of the housing case **1** to the outside of the housing case **1** through the notch **18**, the portion between the sealing member **19** and the sealing member **39**, and the notch **38**. The cable C may be a power supply cable used to supply power to the fusion splicer **100** as described above, or may be a power supply cable used to supply power to an information terminal (such as a smart phone, for example) for managing fusion work in the fusion splicer **100**. Two or more cables C may be sandwiched between the sealing member **19** and the sealing member **39**.

(61) A configuration of the tray **40** will be described with reference to FIGS. **9** to **11**. FIG. **9** is a perspective view of the tray **40** from a side of a first region **50**. FIG. **10** is a perspective view of the tray **40** from a side of a second region **60**. FIG. **11** is a cross-sectional view of the housing case **1** along line XI-XI illustrated in FIG. **2**. In FIG. **11**, for convenience of explanation, illustration of various devices housed in the case main body **10** and the lid body **30**, except for the tray **40**, is omitted. In the following description, when the tray **40** is housed in the case main body **10** (see FIG. **2**), a side facing the front side peripheral wall **12***a* of the case main body **10** is referred to as a front side of the tray **40**, and a side facing the rear side peripheral wall **12***b* thereof is referred to as a rear side of the tray **40**, a side facing the left side peripheral wall **12***c* thereof is referred to as a left side of the tray **40**, and a side facing the right side peripheral wall **12***d* thereof is referred to as a right side of the tray **40**. The tray **40** includes a tray main body **41**, a first body contact member **70**, and a second body contact member **80**.

(62) The tray main body **41** is a work table that houses the fusion splicer **100** and the like in order in the housing case **1** and is used for the fusion splicing work for the optical fibers. The operator positions the tray main body **41** in front of his/her body (for example, abdomen) and performs the fusion splicing work on the tray main body **41**. A pair of long wall portions **42** and a pair of short wall portions **43** are provided in the outer peripheral edge portion of the tray main body **41**. The pair of long wall portions **42** are wall-shaped members opposing each other and extending along a left-right direction (a first direction) of the tray **40**. The pair of short wall portions **43** are wall-shaped members opposing each other and extending along a front-rear direction (a second direction) of the tray **40**. The upper side end portions of the pair of long wall portions **42** and the pair of short wall portions **43** slightly protrude upward from the edge portion of the first region **50**, which will be described later. This prevents tools and the like placed in the first region **50** and used for the fusion splicing work from falling out of the tray main body **41**. Of the pair of long wall portions **42**, the long wall portion **42** located on the front side of the tray **40** is referred to as a front side long wall portion **42***a* (one long wall portion), and the long wall portion **42** located on the rear side of the tray **40** is referred to as a rear side long wall portion **42***b*. Further, of the pair of short wall portions **43**, the short wall portion **43** located on the left side of the tray **40** is referred to as a left side short wall portion **43***a*, and the short wall portion **43** located on the right side of the tray **40**

is referred to as a right side short wall portion **43***b*.

(63) The front side long wall portion **42***a* is a portion that comes into contact with the body of the operator during the fusion splicing work. The surface of the front side long wall portion **42***a* has a gently curved surface shape that is slightly protruded from the outer side (the front side) toward the inner side (the rear side) of the tray main body **41**. As a result, the front side long wall portion **42***a* fits the body of the operator, and the stability of the tray **40** is improved. The front side long wall portion **42***a* has a pair of first attachment portions **44** to which a belt put around the waist of the operator is attached. Each first attachment portion **44** is provided at each of the left and right end portions of the front side long wall portion **42***a*. Each first attachment portion **44** is formed in an annular shape, and a belt can be inserted therein. The operator can pass the belt put around his/her waist through each first attachment portion **44** and perform the fusion splicing work in a state where the tray **40** is fixed.

(64) The left side short wall portion **43***a* and the right side short wall portion **43***b* each have a second attachment portion **45** to which a strap put around the neck of the operator is attached. The second attachment portion **45** is provided at substantially the center portion of each of the left side short wall portion **43***a* and the right side short wall portion **43***b* in the front-rear direction of the tray **40**. Each second attachment portion **45** is constituted by two holes penetrating the tray **40** in the left-right direction. When performing the fusion splicing work, the operator first attaches the strap to the tray main body **41** by passing hooks (for example, carabiners) provided at both ends of the strap through two holes. After that, the operator can carry out the fusion splicing work by putting the strap around the neck without continuously holding the tray main body **41**.

(65) Notches **46** and **47** depressed inside the tray main body **41** are provided in the right side portion of the rear side long wall portion **42***b* and the front side portion of the right side short wall portion **43***b*. Each of the notches **46** and **47** constitutes a tray notch. These notches **46** and **47** serve to connect the space above the tray **40** and the space below the tray **40** to each other when the tray **40** is housed in the case main body **10**. Here, an aspect in which the tray **40** is housed will be described with reference to FIG. **11**.

(66) As illustrated in FIG. **11**, the tray **40** is housed inside the case main body **10** through the opening thereof. The lower side end portions of the front side long wall portion **42***a* and the rear side long wall portion **42***b* of the tray main body **41** abut on the step surface **20** of the case main body **10**. The internal space of the housing case **1** is partitioned into an upper side housing space S**1** and a lower side housing space S**2** by the tray **40**. The upper side housing space S**1** is a space surrounded by the lid body **30** (not illustrated) and the tray **40**. The upper side housing space S**1** may house the fusion splicer **100**, the working tools such as a remover, containers for housing chemicals, and the like. The lower side housing space S**2** is a space surrounded by the case main body **10** and the tray **40**. An AC adapter, a battery, or the like used to supply power to the fusion splicer **100** may be housed in the lower side housing space S**2**.

(67) The notches **46** and **47** serve to connect the upper side housing space S**1** and the lower side housing space S**2** described above to each other. For example, when the power is supplied to the fusion splicer **100** using the power supply cable having an AC adapter in the middle thereof, the AC adapter is housed in the lower side housing space S**2**. In this case, a portion of the power supply cable which extends from the AC adapter to the fusion splicer **100** is pulled out from the lower side housing space S**2** to the upper side housing space S**1** through the notch **46**. On the other hand, a portion of the power supply cable which extends from the AC adapter to the external power supply is pulled out from the lower side housing space S**2** to the upper side housing space S**1** through the notch **47**. The portion of the power supply cable which is pulled out through the notch **47** to the upper side housing space S**1** may be pulled out to the outside of the housing case **1** through the insertion portion **5** (the notches **18** and **38**) of the housing case **1**.

(68) The tray main body **41** has the first region **50** and the second region **60** defined (surrounded) by the pair of long wall portions **42** and the pair of short wall portions **43**, as illustrated in FIGS. **9**

and **10**. The first region **50** is a region located on one side (the upper side) of the tray main body **41** in the vertical direction (a third direction) of the tray **40**. The second region **60** is a region located on a side opposite to the first region **50** (the other side (the lower side) of the tray main body **41**) in the tray main body **41** in the vertical direction of the tray **40**.

(69) The first region **50** is a substantially rectangular region in a plan view, as illustrated in FIG. **9**. Various devices such as the fusion splicer **100** used for the fusion splicing work are placed in the first region **50**. A placement portion **51** on which the fusion splicer **100** is placed is provided in the substantially central portion of the first region **50**. The placement portion **51** has a shape depressed inside the tray main body **41** and has a bottom surface with a size allowing the fusion splicer **100** to be placed thereon. The bottom surface has a substantially rectangular shape in a plan view.

(70) A front restricting portion **52**, a pair of side restricting portions **53**, and a rear restricting portion **54** are provided around the placement portion **51** to restrict movement of the fusion splicer **100** placed on the placement portion **51**. The front restricting portion **52** is a wall-shaped member rising upward from the first region **50** and is provided to surround a front side corner portion of the placement portion **51**. Each side restricting portion **53** is an arch-shaped member having two columns aligned in the front-rear direction of the tray **40** and a rod-shaped connecting portion that extends in the front-rear direction and connects the upper side end portions of the two columns to each other. The pair of side restricting portions **53** are provided such that the placement portion **51** is sandwiched therebetween in the left-right direction of the tray **40**. The rear restricting portion **54** is a plate member that connects the rear side end portions of the pair of side restricting portions **53**. The first region **50** is provided with a plurality of housing recesses **55** depressed inside the tray main body **41**. The housing recess **55** houses a container (for example, a hand wrap) for a chemical used for the fusion splicing work. Further, a plurality of insertion recesses **56** depressed inside the tray main body **41** are provided in the vicinity of the front side long wall portion **42***a* in the first region **50**. Insertion portions **83** (see FIG. **14**) of the second body contact member **80** described later are inserted into the insertion recesses **56**.

(71) As illustrated in FIG. **10**, the second region **60** is a substantially rectangular region in a plan view and located a side opposite to the first region **50**. The second region **60** is provided with a plurality of recesses **61** depressed inside the tray main body **41**. By providing the recesses **61**, cavities are generated inside the tray main body **41**, and weight reduction of the tray main body **41** is realized. Moreover, a plurality of beam portions **62** extending linearly are provided between the plurality of recesses **61** to curb a decrease in the strength of the tray main body **41**. The shape of the second region **60** is not limited to the shape described above and may be a flat surface shape as a whole. The first body contact member **70** and the second body contact member **80** can be housed in the second region **60**.

(72) A detailed configuration of the first body contact member **70** and the second body contact member **80** will be described with reference to FIGS. **12** to **15**. FIG. **12** is a perspective view illustrating the first body contact member **70**. FIG. **13** is an enlarged view of a recess **72***a* of the first body contact member **70** and a protrusion **65***a* of a locking member **65** in a state in which the first body contact member **70** is housed. FIG. **14** is a perspective view illustrating the second body contact member **80**. FIG. **15** is a perspective view illustrating the tray **40** with the first body contact member **70** and the second body contact member **80** unfolded.

(73) The first body contact member **70** is a member that comes into contact with the body of the operator during the fusion splicing work. The first body contact member **70** has a pair of shaft portions **71**, a pair of connecting portions **72**, a main body portion **73**, and a pair of leg portions **74**, as illustrated in FIG. **12**. The pair of shaft portions **71** are cylindrical members extending in the same direction. The pair of shaft portions **71** are located apart from each other in the extending direction. Each shaft portion **71** is inserted into a recess (not illustrated) provided in the second region **60** of the tray main body **41**. The pair of shaft portions **71** and the recess provided in the tray main body **41** function as a hinge mechanism. As a result, the first body contact member **70** can be

transitioned between a housed state in which the first body contact member **70** is disposed along the extending direction of the tray main body **41** (see FIG. **10**) and an unfolded state in which the first body contact member **70** stands against the tray main body **41** (see FIG. **15**). As illustrated in FIG. **15**, the first body contact member **70** is disposed along the extending direction of the front side long wall portion **42***a* in the unfolded state.

(74) The pair of connecting portions **72** are members that connect the pair of shaft portions **71** and the main body portion **73** to each other, as illustrated in FIG. **12**. Each connecting portion **72** has the recess **72***a* on the inner side surface thereof. The recess **72***a* is configured such that the protrusion **65***a* of the locking member **65** is fitted into the recess **72***a*. Hereinafter, the locking member **65** will be described. The locking member **65** is provided in the second region **60** of the tray main body **41**, as illustrated in FIG. **10**. The locking member **65** is a member that maintains the housed state of the first body contact member **70**. As illustrated in the enlarged view of FIG. **13**, the locking member **65** has a pair of protrusions **65***a* on the outer side thereof. In the housed state of the first body contact member **70**, the protrusions **65***a* of the locking member **65** are fitted into the recesses **72***a* of the first body contact member **70**, and the first body contact member **70** is locked. As a result, the housed state of the first body contact member **70** is maintained. In a case where the first body contact member **70** is transitioned from the housed state to the unfolded state, both end portions of the locking member **65** are pushed inward (in a direction of arrow D illustrated in FIG. **13**) to release the locking of the first body contact member **70**.

(75) As illustrated in FIG. **12**, the main body portion **73** and the pair of leg portions **74** are elongated plate-like members. In the unfolded state of the first body contact member **70**, as illustrated in FIG. **15**, the main body portion **73** extends in the left-right direction of the tray **40** along the front side long wall portion **42***a*. Further, the pair of leg portions **74** extend in the vertical direction of the tray **40** in a direction apart from the tray main body **41** with both ends of the main body portion **73** in the left-right direction as base ends. Each leg portion **74** has a recess **74***a* inside the tip end portion thereof, as illustrated in FIG. **12**. As illustrated in FIG. **10**, in the housed state of the first body contact member **70**, the second body contact member **80** is housed in a space between the pair of leg portions **74**. At this time, a protrusion **84***a* of the second body contact member **80**, which will be described later, is fitted into the recess **74***a* of each leg portion **74**, and thus the second body contact member **80** is prevented from falling out from the space between the pair of leg portions **74**.

(76) The length Z of each leg portion **74** is greater than the length (the thickness) X in the vertical direction of the tray main body **41**, as illustrated in FIG. **15**. For example, the length Z of each leg portion **74** may be twice or more the length X of the tray main body **41**. The length X of the tray main body **41** may be, for example, 40 mm or more and 80 mm or less. The length Z of each leg portion **74** may be, for example, 80 mm or more and 120 mm or less. Further, the width Y of the main body portion **73** in the vertical direction of the tray main body **41** is smaller than the length Z of each leg portion **74**. For example, the width Y of the main body portion **73** may be one-half or less of the length Z of each leg portion **74**, or may be one-fourth or less thereof.

(77) As illustrated in FIG. **10**, in the housed state of the first body contact member **70**, the second body contact member **80** can be housed in the space between the pair of leg portions **74**. Further, a connection portion E to which a tripod that supports the tray **40** is connected is provided in the second region **60** of the tray **40**. In FIG. **10**, the connection portion E is indicated by a dashed line because it overlaps the second body contact member **80**. The connection portion E exists between the pair of leg portions **74** when viewed in the third direction. The connection portion E is provided at a position overlapping the space between the pair of leg portions **74** (the space at which the second body contact member **80** is located in FIG. **10**) in the vertical direction of the tray main body **41**. That is, when the second body contact member **80** is removed, it is possible to connect the tripod to the connection portion.

(78) As illustrated in FIG. **12**, the main body portion **73** and the pair of leg portions **74** have an

outer surface **75** that comes into contact with the body of the operator performing the fusion splicing work. The outer surface **75** is a surface on an outer side (the front side) in a direction from an inner side (the rear side) of the tray main body **41** toward the outer side (the front side) in the unfolded state of the first body contact member **70** (see FIG. **15**) among the surfaces of the main body portion **73** and the pair of leg portions **74**. The outer surface **75** has a gently curved surface shape that is slightly protruded toward the inner side (the rear side) of the tray main body **41**. The outer surface **75** may not be entirely curved and may have a partially curved surface portion. For example, only the surface of the main body portion **73** may be curved. Further, the outer surface **75** may be flat as a whole without having a curved surface shape.

(79) The second body contact member **80** is a member that comes into contact with the body of the operator during the fusion splicing work. As illustrated in FIG. **14**, the second body contact member **80** has a plate portion **81**, a pair of insertion portions **83**, and a pair of protrusions **84***a*. The plate portion **81** is a rectangular plate-like member in a plan view. The plate portion **81** has an outer surface **82**. The outer surface **82** is a surface on an outer side (the front side) in a direction from the inner side (the rear side) of the tray main body **41** toward the outer side (the front side) in the unfolded state in which the second body contact member **80** stands on the tray main body **41** (see FIG. **15**). The outer surface **82** has a gently curved surface shape that is slightly protruded toward the inner side (the rear side) of the tray main body **41**. The outer surface **82** may not be entirely curved and may have a partially curved surface portion. Further, the outer surface **82** may be flat as a whole without having a curved surface shape.

(80) The pair of insertion portions **83** are portions protruding from the lower side end portion of the plate portion **81** toward the outside of the plate portion **81**. Each insertion portion **83** is inserted into the insertion recess **56** of the first region **50** illustrated in FIG. **9**. The insertion portion **83** has a structure that allows the second body contact member **80** to be attachable to and detachable from the tray main body **41**. As a result, the second body contact member **80** can be transitioned between a housed state in which the second body contact member **80** is disposed along the extending direction of the tray main body **41** (see FIG. **10**) and an unfolded state in which the second body contact member **80** stands on the tray main body **41** (see FIG. **15**). As illustrated in FIG. **15**, the second body contact member **80** is disposed along the extending direction of the front side long wall portion **42***a* in the unfolded state.

(81) The pair of protrusions **84***a* are provided on the upper portions of a pair of lateral side surfaces **84** that are opposed to each other with the outer surface **82** interposed therebetween. As described above, when the second body contact member **80** is housed in the space between the pair of leg portions **74** (see FIG. **10**), each protrusion **84***a* is fitted into the recess **74***a* provided in each of the pair of leg portions **74**, and thus the second body contact member **80** is prevented from falling out from the space between the pair of leg portions **74**.

(82) As described above, in the housing case **1** according to the present embodiment, the insertion portion **5** is provided, and the cable extending from the inside of the housing case **1** to the outside is inserted through the insertion portion **5**, and thus, even in a case where the lid body **30** is closed with respect to the case main body **10**, the cable is not pinched between the case main body **10** and the lid body **30**. As a result, according to the housing case **1**, damage to the cable (for example, damage to the coating) due to the pinching is prevented. That is, power can be supplied to the fusion splicer **100** with the lid body **30** closed, and the arrangement space of the housing case **1** can be reduced during power supply.

(83) In the present embodiment, the first peripheral wall **12** has the first edge portion **13**, the second peripheral wall **32** has the second edge portion **33**, and the first edge portion **13** and the second edge portion **33** come into contact with each other when the lid body **30** is closed with respect to the case main body **10**. The insertion portion **5** includes the notch **18** or **38** provided in at least one of the first edge portion **13** and the second edge portion **33**. Since the insertion portion **5** includes the notch **18** or **38** provided in the first edge portion **13** of the first peripheral wall **12** or the second

edge portion **33** of the second peripheral wall **32**, the cable can be easily inserted through the insertion portion **5**.

(84) In the present embodiment, the housing case **1** further includes the sealing members **19** and **39** configured to seal the gap between the insertion portion **5** and the cable in a state where the lid body **30** is closed with respect to the case main body **10**. In this case, water droplets, dust, or the like is prevented from entering the housing case **1** through a gap between the insertion portion **5** and the cable. As a result, failure of the fusion splicer **100** housed in the housing case **1** can be curbed.

(85) In the present embodiment, the sealing members **19** and **39** may be made of sponge rubber having a hardness of 20 or more and 40 or less. In this case, since the sealing members **19** and **39** have appropriate elasticity, the sealing members come into close contact with the surface of the cable. As a result, the gap between the insertion portion **5** and the cable is more appropriately sealed, and the waterproofness or dustproofness of the housing case **1** is improved.

(86) In the present embodiment, the sealing members **19** and **39** are disposed such that the entire sealing members **19** and **39** are located closer to the inside of the housing case **1** than outermost peripheral surfaces of the first peripheral wall **12** and the second peripheral wall **32**. In this case, it is possible to prevent the sealing members **19** and **39** from peeling off from the housing case **1** due to external impact or the like.

(87) In the present embodiment, the sealing members **19** and **39** include the sealing member **19** (the first sealing member) provided in the first edge portion **13** and the sealing member **39** (the second sealing member) provided in the second edge portion **33**. The sealing member **19** and the sealing member **39** are located such that the cable is sandwiched therebetween in a thickness direction of the housing case **1** when the lid body **30** is closed. In this case, the sealing members **19** and **39** can be easily disposed around the cable.

(88) In the present embodiment, the housing case **1** for the fusion splicer **100** further includes the tray **40** on which the fusion splicer **100** is able to be placed. The tray **40** is able to be housed in the case main body such that the housing case **1** is partitioned into the upper side housing space S**1** and the lower side housing space S**2** in the thickness direction of the housing case **1**. In this case, tools such as devices and chemicals used for the fusion splicing work can be arranged and housed in the housing case **1**. That is, the internal space of the housing case **1** can be effectively utilized.

(89) In the present embodiment, the notches **46** and **47** that connect the upper side housing space S**1** and the lower side housing space S**2** to each other are provided in the outer peripheral edge portion of the tray **40**. In this case, the devices (for example, the fusion splicer **100** and the AC adapter) disposed in the upper side housing space S**1** and the lower side housing space S**2** can be cable-connected via the notches **46** and **47**. That is, the degree of freedom in arranging cable-connected devices is improved.

(90) In the present embodiment, at least one of the case main body **10** and the lid body **30** may have a window portion W made of a transparent member. The window portion W may be formed at a position at which a charging status of the fusion splicer **100** charged through the cable is able to be visually recognized. In this case, the power supply status of the fusion splicer **100** can be easily checked through the window portion W without opening the lid body **30**.

(91) Although the embodiment according to the present disclosure is described in detail above, the present invention is not limited to the above embodiment and can be applied to various embodiments.

(92) For example, the insertion portion **5** through which the cable is inserted may be a through hole provided in the first peripheral wall **12** of the case main body **10** or the second peripheral wall **32** of the lid body **30** instead of the notches **18** and **38**, and the cable may be inserted through the through hole. A sealing member may be provided in such a through hole.

(93) The first body contact member **70** may be attachable to and detachable from the tray main body **41** similarly to the second body contact member **80**. In this case, the state in which the first

body contact member **70** is detached from the tray main body **41** corresponds to the housed state of the first body contact member **70**. Further, the first body contact member **70** may have a rectangular plate shape in a plan view similarly to the second body contact member **80**.
(94) The second body contact member **80** may be able to be housed such that the second body contact member **80** is connected to the tray main body **41** with a hinge mechanism and is folded to a side of the first region **50** of the tray main body **41** similarly to the first body contact member **70**. In this case, the second body contact member **80** may have a U shape (the shape similar to the first body contact member **70**) with a hollow central portion not to come into contact with the fusion splicer **100** or the like in the housed state.
(95) The first body contact member **70** and the second body contact member **80** may have handles that can be gripped by the operator to facilitate the transition between the unfolded state and the housed state.
REFERENCE SIGNS LIST
(96) **1** Housing case **2** Hinge **3** Handle **4** Locking member **5** Insertion portion **10** Case main body **11** Bottom plate **11***a* Uneven portion **12** First peripheral wall **12***a*, **32***a* Front side peripheral wall **12***b*, **32***b* Rear side peripheral wall **12***c*, **32***c* Left side peripheral wall **12***d*, **32***d* Right side peripheral wall **13** First edge portion **14**, **34** End surface **15** First thin wall **15**A Depression portion **16**, **36** Lateral wall portion **15***a*, **16***a*, **17***a*, **35***a*, **36***a* Upper surface **17** Inner wall portion **18**, **38** Notch **18***a*, **38***a* Bottom surface **19**, **39** Sealing member **19***a*, **39***a* End surface **19***b*, **39***b* Upper side surface **19***c*, **39***c* Outer side surface **19***d*, **39***d* Inner side surface **20** Step surface **30** Lid body **31** Top plate **31***a* Uneven portion **32** Second peripheral wall **33** Second edge portion **35** Second thin wall **37** Outer wall portion **40** Tray **42** Long wall portion **42***a* Front side long wall portion **42***b* Rear side long wall portion **43** Short wall portion **43***a* Left side short wall portion **43***b* Right side short wall portion **44** First attachment portion **45** Second attachment portion **46**, **47** Notch **50** First region **51** Placement portion **52** Front restricting portion **53** Side restricting portion **54** Rear restricting portion **55** Housing recess **56** Insertion recess **60** Second region **61** Recess **62** Beam portion **65** Locking member **65***a* Protrusion **70** First body contact member **71** Shaft portion **72** Connecting portion **72***a* Recess **73** Main body portion **74** Leg portion **74***a* Recess **75** Outer surface **80** Second body contact member **81** Plate portion **82** Outer surface **83** Insertion portion **84** Lateral side surface **84***a* Protrusion **100** Fusion splicer **101** Cover **102** Heater **103** Monitor **110** Fusion splicer set A Region B Region C Cable E Connection portion S**1** Upper side housing space S**2** Lower side housing space W Window portion

Claims

1. A housing case for a fusion splicer which is for housing the fusion splicer for an optical fiber, comprising: a case main body including a first side wall; and a lid body attached to the case main body to be openable and closable and including a second side wall configured to match the first side wall when closed, wherein at least one of the first side wall and the second side wall includes an insertion portion configured for a cable extending from the inside of the housing case to the outside thereof to be inserted through the insertion portion in a state where the lid body is closed with respect to the case main body, wherein the first side wall includes a first edge portion, the second side wall includes a second edge portion, and the first edge portion and the second edge portion come into contact with each other when the lid body is closed with respect to the case main body, wherein the insertion portion includes a first case notch provided in the first edge portion and a second case notch provided in the second edge portion, and the housing case further comprises: a first sealing member provided in the first edge portion; and a second sealing member provided in the second edge portion, wherein the first sealing member and the second sealing member are configured to seal a gap between the first case notch, the second case notch, and the cable when the lid body is closed with respect to the case main body, wherein the first sealing member is located

outside the first case notch, and the second sealing member is located inside the second case notch, and wherein the first sealing member and the second sealing member are configured such that the cable is sandwiched therebetween in a thickness direction of the housing case when the lid body is closed with respect to the case main body.

2. The housing case for a fusion splicer according to claim 1, wherein the first sealing member and the second sealing member are made of sponge rubber having a hardness of 20 or more and 40 or less, the hardness being measured on a basis of JIS K 6253.

3. The housing case for a fusion splicer according to claim 1, wherein the first sealing member and the second sealing member are disposed such that the entire sealing members are located closer to the inside of the housing case than outermost peripheral surfaces of the first side wall and the second side wall.

4. The housing case for a fusion splicer according to claim 1, wherein the first edge portion includes a first end surface and a first thin wall standing on the first end surface, wherein the first thin wall is provided with a depression portion that is recessed inside the case main body, and the depression portion includes a pair of first lateral wall portions and an inner wall portion that extends in a facing direction of the pair of first lateral wall portions, and wherein the first case notch is provided in the inner wall portion of the first thin wall.

5. The housing case for a fusion splicer according to claim 1, wherein the second edge portion includes a second end surface and a second thin wall standing on the second end surface, wherein the second thin wall includes an outer wall portion and a pair of second lateral wall portions extending inward of the case main body from the outer wall portion in a direction intersecting with an extending direction of the outer wall portion, and wherein the second case notch is provided in a portion of the outer wall portion of the second side wall corresponding to a region where the pair of second lateral wall portions face each other.

6. The housing case for a fusion splicer according to claim 1, further comprising: a tray on which the fusion splicer is able to be placed, wherein the tray is able to be housed in the case main body such that the housing case is partitioned into an upper side housing space and a lower side housing space in a thickness direction of the housing case.

7. The housing case for a fusion splicer according to claim 6, wherein at least one tray notch that connects the upper side housing space and the lower side housing space to each other is provided in an outer peripheral edge portion of the tray.

8. The housing case for a fusion splicer according to claim 1, wherein at least one of the case main body and the lid body includes a window portion made of a transparent member, and wherein the window portion is formed at a position at which a charging status of the fusion splicer charged through the cable is able to be visually recognized.

9. A fusion splicer set comprising: the housing case according to claim 1; and a fusion splicer for an optical fiber housed in the housing case.

10. A housing case for a fusion splicer which is for housing the fusion splicer for an optical fiber, comprising: a case main body including a first side wall; and a lid body attached to the case main body to be openable and closable and including a second side wall configured to match the first side wall when closed, wherein at least one of the first side wall and the second side wall includes an insertion portion configured for a cable extending from the inside of the housing case to the outside thereof to be inserted through the insertion portion in a state where the lid body is closed with respect to the case main body, the housing case further comprises: a tray on which the fusion splicer is able to be placed, wherein the tray is able to be housed in the case main body such that the housing case is partitioned into an upper side housing space and a lower side housing space in a thickness direction of the housing case, and wherein at least one tray notch that connects the upper side housing space and the lower side housing space to each other is provided in an outer peripheral edge portion of the tray.

11. The housing case for a fusion splicer according to claim 10, wherein at least one of the case

main body and the lid body includes a window portion made of a transparent member, and wherein the window portion is formed at a position at which a charging status of the fusion splicer charged through the cable is able to be visually recognized.

12. A fusion splicer set comprising: the housing case according to claim 10; and a fusion splicer for an optical fiber housed in the housing case.