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Trap-type live wire terminal insulation cap and indirect live wire insulation method for jumper wire using same

Abstract

Proposed is a trap-type live wire terminal insulation cap and an indirect live wire insulation method for a jumper wire using the same configured to easily insert and fix a jumper wire so that a charging part of the jumper wire is wrapped, insulated, and protected, in which the jumper wire is hung on an electric pole while a terminal charging part is exposed by cutting work during new installation, replacement, or repair of an electric wire. Furthermore, a plurality of gripping members forms a trap that is operated only in one direction, thereby being capable of preventing the electric wire from being separated and preventing safety incidents caused by high voltage current. Furthermore, the electric wire is capable of being easily fixed and released by a simple operation using an insulation stick, so that a safe and easy indirect live wire insulation method is realized.

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References Cited

U.S. PATENT DOCUMENTS

Patent No.	Issued Date	Patentee Name	U.S. Cl.	CPC
4835342	12/1988	Guginsky	285/151.1	H02G 3/0675
5582447	12/1995	Leon	292/307R	F16G 11/103
5792987	12/1997	Dong	174/74A	H02G 15/043
5832158	12/1997	Chen	385/87	G02B 6/3825
6126478	12/1999	Presson	439/595	H01R 13/595
11063417	12/2020	Bier	N/A	H02G 15/043
2011/0097948	12/2010	Melni	439/733.1	H01R 4/56
2013/0217250	12/2012	Melni	439/271	H01R 11/11
2014/0127938	12/2013	De France	29/857	H01R 43/16
2018/0254623	12/2017	Bier et al.	N/A	N/A

FOREIGN PATENT DOCUMENTS

Patent No.	Application Date	Country	CPC
4-10508	12/1991	JP	N/A
6-44254	12/1993	JP	N/A
8-36932	12/1995	JP	N/A
9-74635	12/1996	JP	N/A
2006-121781	12/2005	JP	N/A
2007-288885	12/2006	JP	N/A
2007-295726	12/2006	JP	N/A
2008-123913	12/2007	JP	N/A
2014-45597	12/2013	JP	N/A
3198314	12/2014	JP	N/A
20-0147818	12/1998	KR	N/A

20-0429996	12/2005	KR	N/A
10-2007-0062827	12/2006	KR	N/A
10-2016-0046156	12/2015	KR	N/A
10-1777080	12/2016	KR	N/A
20-2019-0002699	12/2018	KR	N/A
10-2281030	12/2020	KR	N/A
10-2327599	12/2020	KR	N/A

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Background/Summary

CROSS REFERENCE TO RELATED APPLICATIONS

(1) This application is the National Phase of PCT International Application No. PCT/KR2021/019694, filed on Dec. 23, 2021, which claims priority under 35 U.S.C. 119 (a) to Patent Application No. 10-2021-0034490, filed in the Republic of Korea on Mar. 17, 2021, all of which are hereby expressly incorporated by reference into the present application.

TECHNICAL FIELD

(2) The present disclosure relates to a trap-type live wire terminal insulation cap and an indirect live wire insulation method for a jumper wire using the trap-type live wire terminal insulation cap. More specifically, the present disclosure relates to a trap-type live wire terminal insulation cap and an indirect live wire insulation method using the trap-type live wire terminal insulation cap configured to easily insert and fix a charging part of an electric wire in a live wire state so that the charging part of the electric wire is capable of being wrapped, insulated, and protected, the electric wire being a jumper wire that is hung on an electric pole while a terminal charging part is exposed by cutting work during new installation, replacement, or repair of the electric wire. Furthermore, in the trap-type live wire terminal insulation cap, a plurality of gripping members is inserted such that the plurality of gripping members forms a trap that is operated only in one direction, so that the fixed electric wire is prevented from being separated and is maintained in a firmly fixed state, thereby being capable of preventing safety incidents caused by high voltage current. Furthermore, in the trap-type live wire terminal insulation cap, the electric wire is capable of being easily fixed and released by a simple operation using an insulation stick for an indirect live wire, so that a safe and easy indirect live wire insulation method is capable of being realized.

BACKGROUND ART

(3) Generally, high power generated from a power plant is transmitted to each substation by a high-pressure electric power through a transmission line such as a transmission tower and so on. Next, in the substation, several processes of a transformation process are performed, and then an electric power distribution process for supplying electric power to each area by using cables is performed so that consumers in each home, each building, or the like are capable of using electric power.

(4) At this time, electric power supply to general consumers is performed by supplying electric power through telegraph poles installed at a predetermined distance, and a span unit connection of power transmission and distribution electric wire cables of each telegraph pole is performed by using jumper wires.

(5) That is, the power transmission and distribution electric wire cables to which the telegraph pole is to be connected is coupled through an insulator from both sides of a crossarm that is transversely installed on both sides of the upper end of the telegraph pole, the electric wires between the

insulator is connected by the jumper wires, and the connected jumper wires are constructed such that the connected jumper wires are capable of being supported by the insulator installed on the crossarm.

(6) The jumper wire may be required to be connected, cut, or replaced due to installation, replacement, or repair of various electric power distribution lines. At this time, since a high voltage current flows on the jumper wire, work is performed after a charging part of the cut jumper wire is insulated.

(7) Meanwhile, as one of the technologies of an insulation cap for insulating a charging part of a new electric wire or a jumper wire, Korean Utility Model No. 20-0147818 (hereinafter, referred to as 'a conventional technology') has been proposed.

(8) As illustrated in FIG. 1 and FIG. 2, in the conventional technology, a high voltage wire holder **10** configured to hold a high voltage wire **1** by inserting the cut high voltage wire **1** into the high voltage holder **10** and an insulation cap body configured to tighten the high voltage wire holder **10** inward when the high voltage wire holder **10** is inserted into the insulation cap body **20** are provided. Furthermore, in the high voltage wire holder **10**, a slanted insertion hole **12** having a wide entrance and having a narrow inner side is formed on a center line of a head part **11** positioned at an upper side of the high voltage wire holder **10**, a holding part **14** having a lower end portion formed in a conical shape and having an outer circumference provided with a male-threaded portion **13** is formed on a lower side of the head part **11** and is formed integrally with the head part **11**, a holding hole in communication with the slanted insertion hole **12** is formed through an inner side of the holding part **14**, and the holding part **14** has three to six cutout parts **16** in a radial direction. Furthermore, the insulation cap body **20** has an opened upper portion formed in a cylindrical shape and has an inner side provided with a female-threaded part **21** to which the male-threaded part **14** of the holding part **14** is fastened, and has a lower side provided with a space part **22** having a predetermined size.

(9) As illustrated in FIG. 2, in a state in which the high voltage wire holder **10** is fastened to a terminal of the high voltage wire **1**, the high voltage wire holder **10** is coupled to the insulation cap body **20**, so that the terminal of the high voltage wire **1** is insulated.

(10) However, in the conventional technology, since the insulated terminal is not fixed to a predetermined position, various problems such as a separation of the high voltage wire **1** may occur during work.

(11) Therefore, generally, a method of fastening the insulated terminal to a wire positioned adjacent to the terminal. In this case, apart from an insulation process, a process of fixing the terminal of the high voltage wire **1** is required to be additionally performed, so that there is a problem that work time and cost for the fixing of the terminal of the high voltage wire **1** are further required.

(12) In addition, in electric wire work, an insulated apparatus is used so as to perform the electric wire work. In this case, since several processes of work is required to be performed while the worker looking up the electric wire, there is a problem that the worker feels a lot of fatigue due to labor intensity and physical limits of the worker.

DISCLOSURE

Technical Problem

(13) Accordingly, the present disclosure has been made keeping in mind the above problems occurring in the related art. Conventionally, an insulation cap configured to insulate a terminal of a cut electric wire has a problem that the terminal of the insulated electric wire is not fixed to a predetermined position so that separation of the electric wire and so on may occur, and has a problem that work time and cost are further required since a process of fixing the terminal of the cut electric wire is required to be performed.

(14) In order to solve these problems, according to the present disclosure, there is provided a trap-type live wire terminal insulation cap and an indirect live wire insulation method for a jumper wire using the trap-type live wire terminal insulation cap capable of safely, easily, and firmly fixing a

terminal that is a charging part of a new electric wire or a cut electric wire by only inserting the terminal into the trap-type live wire terminal insulation cap, the trap-type live wire terminal insulation cap being configured to form a trap such that a fixing force is more strongly generated when the new electric wire or the cut electric wire is pulled in a direction in which the electric wire is separated, thereby being capable of safely protecting the terminal of the electric wire. Furthermore, in the trap-type live wire terminal insulation cap, the electric wire is capable of being fixed or released by a simple operation in which an operation head is held and moved by using an insulation stick for an indirect live wire, so that indirect live wire insulation work is capable of being safely and easily performed. Furthermore, in the trap-type live wire terminal insulation cap, since a jumper wire supporting member is installed on an electric wire having tension or a suspension insulator and the trap-type live wire terminal insulation cap is coupled to the jumper wire supporting member, the new electric wire or the cut electric wire is stably protected at a predetermined position, thereby being capable of increasing safety and efficiency of work.

Technical Solution

(15) In order to achieve the objectives as described above, in the present disclosure, there is provided a trap-type live wire terminal insulation cap including: a base body **100** into which a terminal of a jumper wire W is inserted, the base body **100** having a front side of an outer circumference provided with a plurality of operation holes **112** formed therethrough; a plurality of gripping members **200** having front sides thereof hinge-coupled to the operation holes **112** of the base body **100**, the gripping members **200** having respective links **210** that protrude on front side upper portions of the gripping members **200**; an operation head **300** slidably coupled to the front side of the outer circumference of the base body **100** such that the operation head **300** is elastically supported rearward, the operation head **300** which has a front surface provided with respective operation grooves **310** corresponding to the operation holes **112** and to which the links **210** of the gripping members **200** are hinge-coupled to the operation grooves **310**; and a hanger-type jumper wire supporting member **400** having an upper portion coupled to an electric wire L having tension or to a suspension insulator and having a lower portion to which a rear side of the base body **100** is coupled.

(16) In order to achieve the objectives as described above, in the present disclosure, there is provided a trap-type live wire terminal insulation cap including: a base body **100** into which a terminal of a jumper wire W is inserted, the base body **100** having a front side of an outer circumference provided with a plurality of operation holes **112** formed therethrough; a plurality of gripping members **200** having front sides thereof hinge-coupled to the operation holes **112** of the base body **100**, the gripping members **200** having respective links **210** that protrude on front side upper portions of the gripping members **200**; an operation head **300** slidably coupled to the front side of the outer circumference of the base body **100** such that the operation head **300** is elastically supported rearward, the operation head **300** which has a front surface provided with respective operation grooves **310** corresponding to the operation holes **112** and to which the links **210** of the gripping members **200** are hinge-coupled to the operation grooves **310**; and a crossarm-type jumper wire supporting member **500** having an upper portion coupled to a crossarm S and to which a rear side of the base body **100** is coupled to at least one of both sides of the crossarm-type jumper wire supporting member **500**.

(17) In addition, the base body **100** may include: a rear body **110** into which the terminal of the jumper wire W is inserted and which has a front side of an outer circumference provided with the plurality of operation holes **112** formed therethrough; and a front body **120** into which a front side of the rear body **110** is inserted and coupled, the front body **120** having a rear surface provided with a plurality of installation grooves **122** so as to be positioned outside the rear body **110**, and the front body **120** being provided with respective elastic members **124** installed in the installation grooves **122**, wherein the operation head **300** may include an elastic supporting part **320** which protrudes on an outer circumference of the operation head **300** and which supports rear sides of the elastic

members **124**.

(18) In addition, the gripping members **200** may include respective teeth parts **220** formed on rear lower surfaces of the gripping members **200**, and the teeth parts **220** may be formed in curved shapes.

(19) In addition, the hanger-type jumper wire supporting member **400** may include: a coupling ring **410** having an upper portion hung and coupled to the electric wire L having tension or to the suspension insulator; and an insulation rope **420** having an upper portion coupled to a lower portion of the coupling ring **410** and having a lower portion coupled to the rear side of the base body **100**.

(20) In addition, the coupling ring **410** may include: a first hook **412** having an upper inner side provided with a first hanging groove into which the electric wire L having tension or the suspension insulator is capable of being inserted and hung, the first hook **412** having a first side surface provided with a rail groove **412a** formed in an arc shape and having an upper rear side opened; a separation prevention lever **414** having an upper terminal opened such that a second hanging groove corresponding to the first hanging groove of the first hook **412** is formed, the separation prevention lever **414** having an upper portion formed in a shape corresponding to a shape of the rail groove **412a** of the first hook **412** and coupled to the rail groove **412a** such that the separation prevention lever **414** is capable of being rotated along the rail groove **412a**, and the separation prevention lever **414** having a lower portion that protrudes toward the opened upper rear side of the first hook **412**; and a second hook **416** having a third hanging groove corresponding to the first hanging groove of the first hook **412**, the second hook **416** being coupled to the first side surface of the first hook **412** and closing a first side of the rail groove **412a** of the first hook **412** and a first side of the opened upper rear side of the first hook **412**.

(21) In addition, the crossarm-type jumper wire supporting member **500** may include: a base frame **510** having a length in a vertical direction; a fixing part **520** coupled to an upper portion of the base frame **510** and installed on the crossarm S; and a position adjustment part **530** slidably coupled to the base frame **510** and coupled to the base frame **510** such that the rear side of the base body **100** is capable of being rotated.

(22) In addition, the fixing part **520** may include a coupling part **521** having a front side opened, the coupling part **521** being formed on an upper portion and a lower portion of the fixing part **520** so as to be coupled to the upper portion of the base frame **510**.

(23) In addition, the fixing part **520** may include: a lower supporting member **522** hinge-coupled to a rear side of the fixing part **520**; and a first tightening device **523** hinge-coupled to a rear lower portion of the fixing part **520**, the first tightening device **523** having an upper portion hinge-coupled to a rear side of the lower supporting member **522** and being configured to move the lower supporting member **522** up and down.

(24) In addition, the fixing part **520** may include a square crossarm fixing member **524** having an upper portion coupled to an inner upper portion of the fixing part **520**.

(25) In addition, the position adjustment part **530** may include: a moving body **531** slidably coupled to the base frame **510**; a locking part **532** installed on a rear side of the moving body **531** and configured to fix or release a sliding movement of the moving body **531**; and a coupling protrusion **533** that protrudes on a front surface of the moving body **531**, the coupling protrusion **533** being coupled such that the rear side of the base body **100** is capable of being rotated.

(26) In addition, the coupling protrusion **533** may include a pair of coupling protrusions **533** that protrudes from both sides of a rear surface of the moving body **531**.

(27) In addition, the position adjustment part **530** may include: an upper wire fixing member **534** having an upper portion of a rear surface thereof coupled to an upper portion of a front surface of the moving body **531** such that the upper wire fixing member **534** is capable of being rotated, the upper wire fixing member **534** having a front side of a lower surface provided with an upper accommodating groove **534a** in which the jumper wire W is capable of being accommodated; a second tightening device **535** having an upper portion which penetrates a rear side of the lower

surface of the upper wire fixing member **534** and which is screw-coupled to the upper wire fixing member **534**; and a lower wire fixing member **536** having a rear side through which the second tightening device **535** penetrates and to which the second tightening device **535** is screw-coupled, the lower wire fixing member **536** being installed spaced apart from a lower portion of the upper wire fixing member **534**, and the lower wire fixing member **536** having a front side of an upper surface provided with a lower accommodating groove **536a** in which the jumper wire W is capable of being accommodated.

(28) In addition, the position adjustment part **530** may include: a rotation adjustment part **537** which protrudes on a lower portion of the front surface of the moving body **531** and in which a penetration hole **537a** is formed in the vertical direction; and a rotation fixing member **538** which is inserted into and coupled to a lower portion of the penetration hole **537a** of the rotation adjustment part **537** and which is provided with a locking member **538a** configured to be moved upward and downward along the penetration hole **537a**, wherein the upper wire fixing member **534** may include an angle adjustment groove **534d** including a plurality of angle adjustment grooves **534d** formed in the rear side of the lower surface of the upper wire fixing member **534** in left and right directions, the angle adjustment grooves **534d** being configured such that the locking member **538a** of the rotation fixing member **538** is capable of being inserted and pulled.

(29) In addition, in order to achieve the objectives as described above, in the present disclosure, there is provided an indirect live wire insulation method for a jumper wire, the method using a trap-type live wire terminal insulation cap C, and the method including: a first preparation process **S10** in which the hanger-type jumper wire supporting member **400** or the crossarm-type jumper wire supporting member **500** is installed around the jumper wire W that requires work; a second preparation process **S20** in which a rear side of the trap-type live wire terminal insulation cap C is coupled to the hanger-type jumper wire supporting member **400** or the crossarm-type jumper wire supporting member **500**; a cutting process **S30** in which the jumper wire W that requires work is cut; and a fastening process **S40** in which a terminal of the jumper wire W that is cut is inserted into and fixed to the trap-type live wire terminal insulation cap C.

Advantageous Effects

(30) In the trap-type live wire terminal insulation cap and the indirect live wire insulation method for the jumper wire using the trap-type live wire terminal insulation cap according to the present disclosure, when the cut jumper wire, i.e., the electric wire, is inserted into the base body, the plurality of gripping members maintaining the trap that is operated only in one direction is splayed, so that the electric wire is capable of being easily inserted into the base body. Furthermore, by the operation head installed on the base body such that the operation head is elastically supported rearward, the plurality of gripping members maintains the trap that is operated only in one direction after the electric wire is inserted into the base body, and the plurality of gripping members more firmly fixes the electric wire when the electric wire is moved in a direction in which the electric wire is separated, so that the new electric wire or the cut electric wire (the jumper wire) is capable of being easily fixed by only performing a simple electric wire insertion operation. Furthermore, there is an effect that the terminal of the new electric wire or the cut jumper wire, i.e., the charging part is capable of being wrapped, insulated, and protected safely and firmly.

(31) In addition, by using the hanger-type jumper wire supporting member which is installed on an electric wire having tension or an suspension insulator and to which the rear side of the base body is capable of being coupled or by using the crossarm-type jumper wire supporting member which is installed on a crossarm and to which the rear side of the base body is capable of being coupled, the new electric wire or the cut jumper wire is capable of being stably and firmly fixed to a predetermined position, so that there are effects that accidents caused by high voltage current during indirect live wire work may be prevented and work efficiency may be increased by reducing labor intensity and fatigue according to physical limits of a worker.

Description

DESCRIPTION OF DRAWINGS

- (1) FIG. 1 is a perspective view illustrating a conventional insulation cap.
- (2) FIG. 2 is a cross-sectional view illustrating a state of use of the conventional insulation cap.
- (3) FIG. 3 is a schematic view illustrating an actual work state of an indirect live wire insulation method for a jumper wire using a trap-type live wire terminal insulation cap according to an exemplary embodiment of the present disclosure.
- (4) FIG. 4 is a perspective view illustrating the trap-type live wire terminal insulation cap according to an exemplary embodiment of the present disclosure.
- (5) FIGS. 5A and 5B show exploded perspective views illustrating the trap-type live wire terminal insulation cap according to an exemplary embodiment of the present disclosure.
- (6) FIGS. 6A and 6B show cross-sectional perspective views illustrating a state before operating and a state after operating the trap-type live wire terminal insulation cap according to an exemplary embodiment of the present disclosure.
- (7) FIG. 7 is a side cross-sectional view illustrating the operation of the trap-type live wire terminal insulation cap according to an exemplary embodiment of the present disclosure.
- (8) FIGS. 8A and 8B show a front view and a side view illustrating a hanger-type jumper wire supporting member to which the trap-type live wire terminal insulation cap according to an exemplary embodiment of the present disclosure is coupled.
- (9) FIG. 9 is a perspective view illustrating a coupling ring.
- (10) FIG. 10 is a projection side view illustrating an operation of the coupling ring.
- (11) FIG. 11A shows an exploded perspective view illustrating the coupling ring, and FIG. 11B shows an exploded perspective view in a different angle illustrating the coupling ring.
- (12) FIG. 12 is a schematic view illustrating a fastening process of the indirect live wire insulation method for the jumper wire using the trap-type live wire terminal insulation cap, in which fixing of a cut jumper wire by using the hanger-type jumper wire supporting member coupled to the trap-type live wire terminal insulation cap according to an exemplary embodiment of the present disclosure is illustrated.
- (13) FIGS. 13A and 13B show perspective views illustrating a crossarm-type jumper wire supporting member to which the trap-type live wire terminal insulation cap according to an exemplary embodiment of the present disclosure is coupled.
- (14) FIGS. 14A and 14B show side views illustrating the crossarm-type jumper wire supporting member according to an exemplary embodiment of the present disclosure.
- (15) FIG. 15 is a partial side view illustrating the crossarm-type jumper wire supporting member according to an exemplary embodiment of the present disclosure.
- (16) FIGS. 16A and 16B show side views illustrating the crossarm-type jumper wire supporting member according to an exemplary embodiment of the present disclosure, in which an upper portion of a fixing part is coupled to a base frame.
- (17) FIG. 17A shows a partial side view illustrating the crossarm-type jumper wire supporting member to which a square crossarm fixing member according to an exemplary embodiment of the present disclosure is not coupled, and FIG. 17B shows a perspective view illustrating the square crossarm fixing member.
- (18) FIG. 18 is a partial exploded perspective view illustrating a position adjustment part according to an exemplary embodiment of the present disclosure.
- (19) FIG. 19 is a bottom perspective view of FIG. 15 in a different angle.
- (20) FIGS. 20A and 20B show front views of the crossarm-type jumper wire supporting member in which a rotation of the trap-type live wire terminal insulation cap and a rotation of an electric wire fixing member according to an exemplary embodiment of the present disclosure are illustrated.

- (21) FIG. 21 is a partial side cross-sectional view of the position adjustment part in which an operation of the electric wire fixing member according to an exemplary embodiment of the present disclosure is illustrated.
- (22) FIG. 22 is a partial side cross-sectional view of the crossarm-type jumper wire supporting member in which the position adjustment part according to an exemplary embodiment of the present disclosure is illustrated.
- (23) FIG. 23 is a partial side cross-sectional view of the crossarm-type jumper wire supporting member in which an upward movement of the position adjustment part according to an exemplary embodiment of the present disclosure is illustrated.
- (24) FIG. 24 is a partial side cross-sectional view of the crossarm-type jumper wire supporting member in which a downward movement of the position adjustment part according to an exemplary embodiment of the present disclosure is illustrated.
- (25) FIG. 25 is a schematic view illustrating a fastening process of the indirect live wire insulation method for the jumper wire using the trap-type live wire terminal insulation cap, in which fixing of the cut jumper wire by using the crossarm-type jumper wire supporting member coupled to the trap-type live wire terminal insulation cap according to an exemplary embodiment of the present disclosure is illustrated.
- (26) FIG. 26 is a schematic view illustrating a preparation process of the indirect live wire insulation method for the jumper wire using the trap-type live wire terminal insulation cap, in which fixing of the jumper wire that is not cut by using the crossarm-type jumper wire supporting member according to an exemplary embodiment of the present disclosure is illustrated.
- (27) FIG. 27 is a side view illustrating the crossarm-type jumper wire supporting member according to another embodiment of the present disclosure.
- (28) FIG. 28 is a schematic view illustrating a preparation process of the indirect live wire insulation method for the jumper wire using the trap-type live wire terminal insulation cap, in which a wire tensioner is coupled to a wire tensioner ring of the crossarm-type jumper wire supporting member according to another embodiment of the present disclosure.
- (29) FIG. 29 is a schematic view illustrating a preparation process of the indirect live wire insulation method for the jumper wire using the trap-type live wire terminal insulation cap, in which the wire tensioner is coupled to a wire tensioner coupling hole of the crossarm-type jumper wire supporting member according to another embodiment of the present disclosure.

DETAILED EXPLANATION OF THE MAIN SYMBOLS IN THE DRAWINGS

- (30) C: trap-type live wire terminal insulation cap S: crossarm W: jumper wire L: electric wire (referred to as an electric wire other than a jumper wire) **100**: base body **110**: rear body **112**: operation hole **120**: front body **122**: installation groove **124**: elastic member **200**: gripping member **210**: link **220**: teeth part **300**: operation head **310**: operation groove **320**: elastic supporting part **400**: hanger-type jumper wire supporting member **410**: coupling ring **412**: first hook **412a**: rail groove **412b**: first auxiliary rail groove **414**: separation prevention lever **414a**: auxiliary protrusion **416**: second hook **420**: insulation rope **500**: crossarm-type jumper wire supporting member **510**: base frame **520**: fixing part **520a**: wire tensioner ring **520b**: wire tensioner coupling hole **521**: coupling part **522**: lower supporting member **523**: first tightening device **524**: square crossarm fixing member **530**: position adjustment part **531**: moving body **532**: locking part **532a**: fixing block **532b**: link bar **532c**: adjustment ring **532d**: pressing elastic member **532a-1**: packing **533**: coupling protrusion **534**: upper wire fixing member **534a**: upper receiving groove **534b**: fixing hole **534d**: angle adjustment groove **535**: second tightening device **536**: lower wire fixing member **536a**: lower receiving groove **537**: rotation adjustment part **537a**: penetration hole **538**: rotation fixing member **538a**: locking member

MODE FOR INVENTION

- (31) The present disclosure relates to a trap-type live wire terminal insulation cap for fixing a cut electric wire, and relates to an indirect live wire insulation method for a jumper wire using the trap-

type live wire terminal insulation cap. More specifically, disclosed is a technical field relating to a trap-type live wire terminal insulation cap and an indirect live wire insulation method for a jumper wire using the same, in which the trap-type live wire terminal insulation cap: realizes easy insertion and fixing of a terminal of an electric wire (hereinafter, referred to as 'a jumper wire W'), i.e., the jumper wire which has been cut by cutting work during new installation, replacement, or repair of an electric wire and which is hung from a pole in a state where the terminal of the jumper wire is exposed, thereby being capable of wrapping, insulating, and protecting the terminal of the jumper wire W, a terminal end a charging part of a jumper wire; has a plurality of gripping members inserted in the form of a trap that is operated only in one direction so as to prevent separation of the fixed jumper wire W when the fixed jumper wire W is moved in a direction of separation, thereby being capable of maintaining a more firmly and safely fixed state and preventing safety incidents caused by high voltage current; and realizes the trap form of the gripping members **200**, which is operated only in one direction, to be released by a simple operation of moving an operation head **300** so that fixation of the jumper wire W is capable of being released, thereby being capable of realizing releasing work to be safely and easily performed.

(32) In addition, in the present disclosure, a hanger-type jumper wire supporting member **400**, which is installed at an electric wire L having tension, a suspension insulator, or a crossarm in the shape of '□' or 'L' and to which a rear side of the trap-type live wire terminal insulation cap C is coupled, and a crossarm-type jumper wire supporting member **500**, which is installed at a crossarm, especially at a square crossarm or a single-type crossarm, and to which the rear side of the trap-type live wire terminal insulation cap C is coupled, are used so that the cut jumper wire W is stably and firmly fixed at a predetermined position, thereby being capable of preventing an accident caused by high voltage current during insulating work and being capable of increasing work efficiency.

(33) In order to realize the present disclosure as described above, a configuration of the present disclosure includes: a base body **100** into which a terminal of the jumper wire W is inserted, the base body **100** having a front side of an outer circumference provided with a plurality of operation holes **112** formed therethrough; the plurality of gripping members **200** having front sides thereof hinge-coupled to the operation holes **112** of the base body **100**, the gripping members **200** having respective links **210** that protrude on front side upper portions of the gripping members **200**; and the operation head **300** slidably coupled to the front side of the outer circumference of the base body **100** such that the operation head **300** is elastically supported rearward, the operation head **300** which has a front surface provided with respective operation grooves **310** corresponding to the operation holes **112** and to which the links **210** of the gripping members **200** are hinge-coupled to the operation grooves **310**, and includes the hanger-type jumper wire supporting member **400** having an upper portion coupled to the electric wire L having tension or the suspension insulator and having a lower portion to which a rear side of the base body **100** is coupled.

(34) In order to realize the present disclosure as described above, another configuration of the present disclosure includes: a base body **100** into which a terminal of the jumper wire W is inserted, the base body **100** having a front side of an outer circumference provided with a plurality of operation holes **112** formed therethrough; the plurality of gripping members **200** having front sides thereof hinge-coupled to the operation holes **112** of the base body **100**, the gripping members **200** having respective links **210** that protrude on front side upper portions of the gripping members **200**; and the operation head **300** slidably coupled to the front side of the outer circumference of the base body **100** such that the operation head **300** is elastically supported rearward, the operation head **300** which has a front surface provided with respective operation grooves **310** corresponding to the operation holes **112** and to which the links **210** of the gripping members **200** are hinge-coupled to the operation grooves **310**, and includes the crossarm-type jumper wire supporting member **500** having an upper portion coupled to a crossarm S and to which a rear side of the base body **100** is coupled to at least one of both sides of the crossarm-type jumper wire supporting member **500**.

(35) In addition, the base body **100** of the present disclosure includes: a rear body **110** into which the terminal of the jumper wire **W** is inserted and which has a front side of an outer circumference provided with the plurality of operation holes **112** formed therethrough; and a front body **120** into which a front side of the rear body **110** is inserted and coupled, the front body **120** having a rear surface provided with a plurality of installation grooves **122** so as to be positioned outside the rear body **110**, and the front body **120** being provided with respective elastic members **124** installed in the installation grooves **122**, and the operation head **300** includes an elastic supporting part **320** which protrudes on an outer circumference of the operation head **300** and which supports rear sides of the elastic members **124**.

(36) In addition, the gripping members **200** of the present disclosure include respective teeth parts **220** formed on rear lower surfaces of the gripping members **200**, and the teeth parts **220** are formed in curved shapes.

(37) In addition, the hanger-type jumper wire supporting member **400** of the present disclosure includes: a coupling ring **410** having an upper portion hung and coupled to the electric wire **L** having tension or the suspension insulator; and an insulation rope **420** having an upper portion coupled to a lower portion of the coupling ring **410** and having a lower portion coupled to the rear side of the base body **100**.

(38) In addition, the coupling ring **410** of the present disclosure includes: a first hook **412** having an upper inner side provided with a first hanging groove into which the electric wire **L** having tension is capable of being inserted and hung, the first hook **412** having a first side surface provided with a rail groove **412a** formed in an arc shape and having an upper rear side opened; a separation prevention lever **414** having an upper terminal opened such that a second hanging groove corresponding to the first hanging groove of the first hook **412** is formed, the separation prevention lever **414** having an upper portion formed in a shape corresponding to a shape of the rail groove **412a** of the first hook **412** and coupled to the rail groove **412a** such that the separation prevention lever **414** is capable of being rotated along the rail groove **412a**, and the separation prevention lever **414** having a lower portion that protrudes toward the opened upper rear side of the first hook **412**; and a second hook **416** having a third hanging groove corresponding to the first hanging groove of the first hook **412**, the second hook **416** being coupled to the first side surface of the first hook **412** and closing a first side of the rail groove **412a** of the first hook **412** and a first side of the opened upper rear side of the first hook **412**.

(39) In addition, the crossarm-type jumper wire supporting member **500** of the present disclosure includes: a base frame **510** having a length in a vertical direction; a fixing part **520** coupled to an upper portion of the base frame **510** and installed on the crossarm **S**; and a position adjustment part **530** slidably coupled to the base frame **510** and coupled to the base frame **510** such that the rear side of the base body **100** is capable of being rotated.

(40) In addition, the fixing part **520** of the present disclosure includes a coupling part **521** having a front side opened, the coupling part **521** being formed on an upper portion and a lower portion of the fixing part **520** so as to be coupled to the upper portion of the base frame **510**.

(41) In addition, the fixing part **520** of the present disclosure includes: a lower supporting member **522** hinge-coupled to a rear side of the fixing part **520**; and a first tightening device **523** hinge-coupled to a rear lower portion of the fixing part **520**, the first tightening device **523** having an upper portion hinge-coupled to a rear side of the lower supporting member **522** and being configured to move the lower supporting member **522** up and down.

(42) In addition, the fixing part **520** of the present disclosure includes a square crossarm fixing member **524** having an upper portion coupled to an inner upper portion of the fixing part **520**.

(43) In addition, the position adjustment part **530** of the present disclosure includes: a moving body **531** slidably coupled to the base frame **510**; a locking part **532** installed on a rear side of the moving body **531** and configured to fix or release a sliding movement of the moving body **531**; and a coupling protrusion **533** that protrudes on a front surface of the moving body **531**, the coupling

protrusion **533** being coupled such that the rear side of the base body **100** is capable of being rotated.

(44) In addition, the coupling protrusion **533** of the present disclosure includes a pair of coupling protrusions **533** that protrudes from both sides of a rear surface of the moving body **531**.

(45) In addition, the position adjustment part **530** of the present disclosure includes: an upper wire fixing member **534** having an upper portion of a rear surface thereof coupled to an upper portion of a front surface of the moving body **531** such that the upper wire fixing member **534** is capable of being rotated, the upper wire fixing member **534** having a front side of a lower surface provided with an upper accommodating groove **534a** in which the jumper wire W is capable of being accommodated; a second tightening device **535** having an upper portion which penetrates a rear side of the lower surface of the upper wire fixing member **534** and which is screw-coupled to the upper wire fixing member **534**; and a lower wire fixing member **536** having a rear side through which the second tightening device **535** penetrates and to which the second tightening device **535** is screw-coupled, the lower wire fixing member **536** being installed spaced apart from a lower portion of the upper wire fixing member **534**, and the lower wire fixing member **536** having a front side of an upper surface provided with a lower accommodating groove **536a** in which the jumper wire W is capable of being accommodated.

(46) In addition, the position adjustment part **530** of the present disclosure includes: a rotation adjustment part **537** which protrudes on a lower portion of the front surface of the moving body **531** and in which a penetration hole **537a** is formed in the vertical direction; and a rotation fixing member **538** which is inserted into and coupled to a lower portion of the penetration hole **537a** of the rotation adjustment part **537** and which is provided with a locking member **538a** configured to be moved upward and downward along the penetration hole **537a**, and the upper wire fixing member **534** includes an angle adjustment groove **534d** including a plurality of angle adjustment grooves **534d** formed in the rear side of the lower surface of the upper wire fixing member **534** in left and right directions, the angle adjustment grooves **534d** being configured such that the locking member **538a** of the rotation fixing member **538** is capable of being inserted and pulled.

(47) In addition, in order to realize the present disclosure as described above, there is provided an indirect live wire insulation method for a jumper wire using a trap-type live wire terminal insulation cap, the indirect live wire insulation method for the jumper wire using the trap-type live wire terminal insulation cap C including: a first preparation process **S10** in which the hanger-type jumper wire supporting member **400** or the crossarm-type jumper wire supporting member **500** is installed around a jumper wire W that requires work; a second preparation process **S20** in which a rear side of the trap-type live wire terminal insulation cap C is coupled to the hanger-type jumper wire supporting member **400** or the crossarm-type jumper wire supporting member **500**; a cutting process **S30** in which the jumper wire W that requires work is cut; and a fastening process **S40** in which a terminal of the jumper wire W that is cut is inserted into and fixed to the trap-type live wire terminal insulation cap C.

(48) Hereinafter, the present disclosure will be described in detail as follows with reference to FIG. **1** to FIG. **29** illustrating an embodiment of the present disclosure.

(49) The base body **100**, which is a main configuration of the trap-type live wire terminal insulation cap C, for realizing the present disclosure is configured as follows.

(50) A distal end of the jumper wire W, i.e., a terminal of the cut jumper wire W is inserted into the base body **100**, and the plurality of operation holes **112** is formed through a front side of an outer circumference of the base body **100**. Furthermore, the base body **100** is formed of a insulation material, has a hollow having a front side thereof opened such that the terminal of the cut jumper wire W is inserted into the base body **100** from the front side to a rear side of the base body **100**, and the jumper wire W inserted by the plurality of gripping members **200** and the operation head **300** that will be described in detail is fixed, so that the terminal of the jumper wire W in which the terminal is cut and exposed is capable of being wrapped, insulated, and protected.

(51) Specifically, the base body **100** of the present disclosure includes the rear body **110** having an insertion groove (not shown) into which the terminal of the cut jumper wire **W** is inserted and having the plurality of operation holes **112** formed through the front side of the outer circumference of the base body **100** along a longitudinal direction, and includes the front body **120** into which the front side of the rear body **110** is inserted and coupled, the front body **120** having an insertion hole (not shown) formed through the front body **120** such that the insertion hole is in communication with the insertion groove, the front body **120** having the rear surface thereof provided with the plurality of installation grooves **122** so as to be positioned outside the rear body **110**, and the front body **120** having the elastic member **124** installed in the installation grooves **122**.

(52) In the rear body **110**, the plurality of operation holes **112** is formed such that the plurality of operating holes **112** formed through the front side of the outer circumference of the rear body **110** has a predetermined length that is longer than a length of the gripping members **200** which will be described in detail later, so that the gripping members **200** are capable of being smoothly rotated when the gripping members **200** are rotated around a hinge shaft, and also rear sides of the gripping members **200** are capable of being moved inward while the gripping members **200** are rotated around the hinge shaft. Therefore, the plurality of gripping members **200** is moved inward and is formed in a trap that is operated only in one direction, so that the terminal of the jumper wire **W** that is exposed after the inserted jumper wire **W** is fixed is wrapped, insulated, and protected.

(53) That is, in the rear body **110**, the insertion groove with an opened front surface is formed so that the terminal of the cut jumper wire **W** is capable of being inserted into the rear body, so that the exposed terminal of the jumper wire **W** is capable of being wrapped, insulated, and protected when the jumper wire **W** is inserted into the rear body **110**.

(54) In addition, the operation hole **112** allows the gripping member **200** which will be described in detail later to be rotated around the hinge shaft so that the rear side of the gripping member **200** is capable of being moved toward the base body **100**, i.e., toward the inside of the rear body **110**. Therefore, the plurality of gripping members **200** forms the trap that is operated only in one direction or not forms the trap that is operated only in one direction, so that the jumper wire **W** inserted inside the base body **100** is capable of being fixed or released.

(55) At this time, the rear body **110** includes a first hinge groove **114** which is formed in an annular shape on the front side of the outer circumference of the rear body **110** and which is positioned on a front side of the operation hole **112**, and includes a first elastic ring **116** which is coupled to the first hinge groove **114** and to which the front side of the gripping member **200** that will be described in detail later is coupled. Furthermore, the first elastic ring **116** is coupled to the first hinge groove **114** such that the front side of the gripping member **200** is hinge-coupled to the first elastic ring, so that the rear side of the gripping member **200** is capable of being moved inward through the operation hole **112** while the gripping member **200** is rotated.

(56) That is, in the first hinge groove **114**, the front side of the gripping member **200** is coupled to the rear body **110** by the first elastic ring **116**, so that the rear side of the gripping member **200** is capable of being moved to the inner side of the rear body **110**, and a rear side of the first elastic ring **116** is rotated around the front side of the gripping member **200** so as to be moved to the inner side of the rear body **110** through the operation hole **112**.

(57) At this time, the first elastic ring **116** may be formed in a ring shape having a conventional metal material so that the front side of the gripping member **200** is capable of being hinge-coupled to the rear body **110**. However, since the first elastic ring **116** may be stretched due to repeated rotation of the gripping member **200** and the gripping member **200** may not be smoothly rotated, it is preferable that the first elastic ring **116** is a snap ring having a first end is separated and configured to resist opening, i.e., an elastic ring having an elastic force in a direction of tightening.

(58) Meanwhile, the rear body **110** includes a coupling part **113** which protrudes on the rear side of the rear body **110** and in which a coupling hole **113a** is formed therethrough. The coupling part **113** is coupled to the hanger-type jumper wire supporting member **400** or the crossarm-type jumper

wire supporting member **500** which will be described in detail later, and allows the cut jumper wire W is positioned at a predetermined position by the trap-type live wire terminal insulation cap C of the present disclosure, thereby realizing an effect of safely and efficiently performing work.

(59) As the front side of the rear body **110** is inserted into and coupled to the front body **120**, the operation head **300** which will be described in detail later is prevented from being separated frontward. Furthermore, the front body **120** has an extension part (not shown) which protrudes and extends in an outer direction of the rear body **110**, has the plurality of installation grooves **122** formed in a rear surface of the extension part, and includes the elastic member **124** installed in the installation grooves **122** such that a front side of the elastic member **124** is supported and a rear side of the elastic member **124** is supported by the operation head **300**.

(60) That is, when the operation head **300**, which will be described in detail later, is slidably coupled to the front side of the outer circumference of the rear body **110**, the extension part of the front body **120** prevents the operation head **300** from being separated frontward and also elastically supports the operation head **300** rearward by the elastic member **124**, so that the operation head **300** is maintained in a state in which the operation head **300** is moved rearward.

(61) At this time, the operation head **300** is hinge-coupled to the link **210** formed at the upper portion of the gripping member **200** which will be described in detail later, and the operation head **300** is configured to move the link **210** of the gripping member **200** rearward, so that the gripping member **200** is rotated around the base body **100**, i.e., rotated around the hinge shaft hinge-coupled to the rear body **110**, i.e., rotated around the first elastic ring **116** so that the rear side of the gripping member **200** is moved to the inner side of the rear body **110** through the operation hole **112**. Accordingly, the plurality of gripping members **200** forms the trap that is operated only in one direction, and an effect of maintaining the inserted jumper wire W to be in a stably and firmly fixed state is realized.

(62) In addition, the front body **120** may further include a corresponding groove (not shown) formed in a rear side of an outer circumference of the front body **120** so as to correspond with the operation hole **112** in order to prevent the front side of the operation hole **112** from being closed as the front side of the rear body **110** is inserted and coupled to the front body **120**.

(63) In addition, the rear body **110** may further include a limiting part **118** that protrudes on the outer circumference of the rear body **110** so as to limit a rearward movement of the operation head **300** that is described above. Furthermore, it is obvious that the limiting part **118** is formed on the outer circumference of the rear body **110**, i.e., the limiting part **118** is formed on a position where an effect of preventing damage to the gripping member **200** and the rear body **110** is capable of being realized by preventing the gripping member **200** from being rotated up to a rotation limit.

(64) The gripping member **200**, which is a main configuration of the trap-type live wire terminal insulation cap C, for realizing the present disclosure is configured as follows.

(65) The gripping member **200** is formed of an insulation material, has the front side hinge-coupled to the base body **100**, i.e., the operation hole **112** of the rear body **110**. Furthermore, the gripping member **200** has the link **210** that protrudes on the upper portion of the front side of the gripping member **200**, and includes the plurality of gripping members **200** as described above. Furthermore, as the link **210** is moved rearward by the operation head **300** and the rear sides of the gripping members **200** are moved to the inner side of the rear body **110** through the operation holes **112**, the plurality of gripping members **200** forms the trap that is operated only in one direction, so that the inserted jumper wire W is capable of being stably and firmly fixed.

(66) In other words, as described above, a structure in which the front side of the gripping member **200** of the present disclosure is hinge-coupled to the operation hole **112** of the rear body **110** is realized such that the first elastic ring **116** is coupled to the first hinge groove **114** which is formed on the front side of the outer circumference of the rear body **110** and which is positioned on the front side of the operation hole **112**, and the front side of the gripping member **200** is hinge-coupled by the first elastic ring **116**.

(67) In addition, the trap in which the plurality of gripping members **200** of the present disclosure is operated only in one direction is realized such that the operation head **300** which will be described in detail later is hinge-coupled to the link **210** and the rear side of the gripping member **200** is moved toward the inner side of the rear body **110** while the gripping member **200** is rotated around the first elastic ring **116** when the link **210** is moved rearward by the operation head **300** that is coupled to the rear body **110** so as to be elastically supported rearward.

(68) That is, the gripping member **200** of the present disclosure is formed in an 'L' shape, and an edge of the gripping member **200** is hinge-coupled to the rear body **110** by the first elastic ring **116**, and the link **210** that protrudes upward is coupled to the operation head **300** which will be described in detail later. Therefore, the gripping member **200** is rotated by a front and rear movement of the operation head **300**, so that an operation in which the trap where the plurality of gripping members **200** is operated only in one direction or an operation in which the trap that is operated only in one direction is released is performed, thereby fixing or releasing the jumper wire **W** inserted into the rear body **110**.

(69) At this time, since the link **210** is required to be rotated while moving in front and rear directions by the operation head **300**, a long hole (not shown) is formed so that the hinge shaft is capable of being smoothly moved in the front and rear directions at the same time when the link **210** is hinge-coupled to the operation head **300**.

(70) In addition, the gripping member **200** of the present disclosure includes a teeth part **220** formed on the rear lower surface of the gripping member **200**. When the plurality of gripping members **200** forms the trap that is only operated in one direction and the jumper wire **W** inserted into the rear body **110** is fixed, the rear lower surface of the gripping member **200** is in contact with the jumper wire **W** and fixes the jumper wire **W**, so that the teeth part **220** is formed on the rear lower surface of the gripping member **200** so that a fixing force is formed.

(71) In addition, since the rear side of the gripping member **200** is rotated when the gripping member **200** is rotated around the first elastic ring **116**, it is preferable that the teeth part **220** is formed in a curved shape so as to increase a contact area with the jumper wire **W**.

(72) The operation head **300**, which is a main configuration of the trap-type live wire terminal insulation cap **C**, for realizing the present disclosure is configured as follows.

(73) The operation head **300** is coupled to the base body **110**, i.e., the operation head **300** is coupled to the front side of the outer circumference of the rear body **110** such that the operation head **300** is capable of being slid and elastically supported rearward. Furthermore, the operation head **300** has the front surface provided with the operation groove **310** corresponding to the operation hole **112**, and the link **210** of the gripping member **200** is hinge-coupled to the operation groove **310**.

Furthermore, the operation head **300** is formed of an insulation material, is elastically supported rearward such that the link **210** of the gripping member **200** is moved rearward so as to rotate the gripping member **200** around the first elastic ring **116**, so that the plurality of gripping members **200** forms the trap that is operated only in one direction and fixes the inserted jumper wire **W**. Furthermore, when a worker moves the operation head **300** by using an insulation stick (not shown), the operation head **300** moves the link **210** of the gripping member **200** frontward so that the trap of the plurality of gripping members **200** that is operated in only one direction is released, thereby releasing the fixing of the inserted jumper wire **W**.

(74) That is, in the operation head **300** of the present disclosure, a through hole (not shown) in which the rear body **110** is capable of being inserted and coupled is formed such that the operation head **300** is capable of being slid on the base body **100**, i.e., the front side of the outer circumference of the rear body **110**. Furthermore, the operation head **300** is elastically supported rearward by the elastic member **124** that is provided in the front body **120**, and the operation head **300** moves the link **210** of the gripping member **200** rearward, or is moved frontward forcibly by the worker so that the link **210** of the gripping member **200** is moved frontward. Accordingly, the plurality of gripping members **200** forms the trap that is operated only in one direction and fixes the

jumper wire W, or releases the trap of the plurality of gripping members **200** that is operated only in one direction so as to release the fixation of the jumper wire W, thereby performing insulating work.

(75) At this time, the operation head **300** of the present disclosure has the front surface provided with the operation groove **310** corresponding to the operation hole **112**, so that the link **210** of the gripping member **200** is capable of being smoothly moved and rotated in the front and rear directions.

(76) In addition, the operation head **300** of the present disclosure includes a second hinge groove **330** which is formed in an annular shape on a front side of an outer circumference of the operation head **300** and which is positioned on a front side of the operation groove **310**, and includes a second elastic ring **340** which is coupled to the second hinge groove **330** and to which the link **210** of the gripping member **200** is coupled. Furthermore, the second elastic ring **340** is coupled to the second hinge groove **330** such that the link **210** of the gripping member **200** is hinge-coupled thereto, so that the gripping member **200** and the link **210** is rotated and moved in the front and rear directions when the operation head **300** is slidably moved along the rear body **110** in the front and rear directions, thereby rotating the gripping member **200** around the first elastic ring **116**.

(77) In addition, when the link **210** is moved in the front and rear directions, the upper portion of the link **210** is rotated in the front and rear directions. That is, when the operation head **300** is moved along the rear body **110** in the front and rear directions, the link **210** is moved in the front and rear directions, so that the gripping member **200** is rotated around the first elastic ring **116** that is fixed.

(78) That is, in the operation head **300** of the present disclosure, when the second elastic ring **240** is coupled to the long hole of the link **210** and is moved along the rear body **110** in the front and rear directions, the link **210** is rotated around the first elastic ring **116** in the front and rear directions, and the upper portion of the link **210** is moved in the front and rear directions so that the rear side of the gripping member **200** is rotated around the first elastic ring **116**, so that the gripping member **200** is moved to the base body **110** through the operation hole **112**, i.e., the gripping member **200** is moved to the inner side of the rear body **110**.

(79) In addition, similar to the first elastic ring **116** as described above, the second hook **340** may be formed in a ring shape having a conventional metal material so that the link **210** of the gripping member **200** is capable of being hinge-coupled to the operation head **300**. However, since the second elastic ring **340** may be stretched due to repeated rotation of the gripping member **200** and the gripping member **200** may not be smoothly rotated, it is preferable that the second elastic ring **340** is a snap ring having a first end is separated and configured to resist opening, i.e., an elastic ring having an elastic force in a direction of tightening.

(80) In relation to the description above, the operation head **300** of the present disclosure includes an elastic supporting part **320** which is formed on the outer circumference of the operation head **300** and which supports the rear side of the elastic member **124** that is provided in the front body **120** that is described above. Furthermore, the elastic supporting part **320** elastically supports the operation head **300** rearward from the fixed front body **120** by the elastic member **124**, so that the link **210** of the gripping member **200** is moved rearward by the operation head **300**, thereby realizing the plurality of gripping members **200** to be formed in the trap that is operated only in one direction normally.

(81) That is, since the operation head **300** of the present disclosure is elastically supported rearward by the elastic member **124**, the plurality of gripping members **200** forms the trap that is operated only in one direction. Therefore, an outer circumference of the jumper wire W inserted into the rear body **110** is fixed by the teeth part **220**, so that the cut and exposed terminal of the jumper wire W is capable of being wrapped, insulated, and protected by the rear body **110**.

(82) At this time, in the operation head **300** of the present disclosure, as the jumper wire W is inserted into the rear body **110**, the rear side of the plurality of gripping members **200** that form the

trap which is operated only in one direction is moved to an outer direction of the rear body **110** by the jumper wire W and is moved frontward, the worker can fix the cut jumper wire W to the trap-type live wire terminal insulation cap C by simply inserting the jumper wire W without any particular process, so that an effect of easily performing insulating work may be realized.

(83) In addition, the operation head **300** of the present disclosure may include a protection cover **350** coupled to the front side of the outer circumference of the operation head **300**. Furthermore, in order to stably perform the operation of the gripping member **200**, the protection cover **350** includes a penetration hole (not shown) configured to prevent separation of the second elastic ring **340** and formed so as to correspond to the elastic member **124** such that elastic support of the elastic member **124** is stably realized, i.e., the penetration hole formed through a position corresponding to the installation groove **122** of the front body **120**, and includes an insertion groove (not shown) into which the link **210** of the gripping member **200** is inserted.

(84) That is, the protection cover **350** is coupled to the front side of the outer circumference of the operation head **300**, is configured to prevent separation of the second elastic ring **340** through an inner circumferential surface in close contact with the outer circumference of the operation head **300**, is configured to guide the link **210** of the gripping member **200** to be stably moved in the front and rear directions through the insertion groove, and is configured such that the operation head **300** is elastically supported rearward by the elastic member **124** stably.

(85) Furthermore, the first elastic ring **116** is configured such that the inner circumferential surface of the operation head **300** is in close contact with the outer circumference of the rear body **110**, so that separation of the first elastic ring **116** is prevented and there is an effect that the rotation of the gripping member **200** is stably performed.

(86) As a result, in the trap-type live wire terminal insulation cap C of the present disclosure, the worker may easily fix the cut jumper wire W by only inserting the jumper wire W into the base body **100**, i.e., the rear body **110**, since the plurality of gripping members **200** forms the trap that is operated only in one direction by the operation head **300**. Furthermore, when the inserted jumper wire W is moved in a direction in which the jumper wire W is separated, i.e., when the inserted jumper wire W is about to be pulled out, the plurality of gripping members **200** is rotated such that the plurality of gripping members **200** forms the trap that is operated only in one direction, so that the inserted jumper wire W is prevented from being separated. Furthermore, when the worker uses the insulation stick and so on, the operation head **300** is capable of being moved frontward by using the elastic supporting part **320**, so that the fixation of the inserted jumper wire W is capable of being easily released, thereby being capable of realizing an effect of increasing work efficiency.

(87) In relation to the description described above, since the trap-type live wire terminal insulation cap C of the present disclosure is installed at a predetermined position around an electric pole so that the cut jumper wire W is stably insulated and protected at a predetermined position, insulating work is capable of being safely and efficiently performed. To this end, the hanger-type jumper wire supporting member **400** which is installed on a suspension insulator or an electric wire L that is not cut, i.e., the electric wire L having tension.

(88) In addition, in a working condition in which the hanger-type jumper wire supporting member **400** is difficult to be installed on the suspension insulator or the electric wire L having tension, the trap-type live wire terminal insulation cap C of the present disclosure may include the crossarm-type jumper wire supporting member **500** installed on the crossarm S.

(89) That is, in the trap-type live wire terminal insulation cap C of the present disclosure, after the hanger-type jumper wire supporting member **400** or the crossarm-type jumper wire supporting member **500** are mounted on the electric wire L having tension, the suspension insulator, or the crossarm S according to a working condition, the coupling part **113** formed on the rear side of the rear body **110** is coupled to the hanger-type jumper wire supporting member **400** or the crossarm-type jumper wire supporting member **500**, thereby realizing an effect of wrapping, insulating, and protecting the cut jumper wire W at a predetermined position.

(90) In more detail, an upper portion of the hanger-type jumper wire supporting member **400** is coupled to the electric wire L having tension or the suspension insulator, and a lower portion of the hanger-type jumper wire supporting member **400** is coupled to the rear side of the base body **100** of the trap-type live wire terminal insulation cap C, i.e., the coupling part **113** formed on the rear side of the rear body **110**.

(91) Specifically, the hanger-type jumper wire supporting member **400** of the present disclosure includes the coupling ring **410** having an upper portion hung and coupled to the electric wire L having tension or the suspension insulator, and includes the insulation rope **420** having an upper portion coupled to a lower portion of the coupling ring **410** and having a lower portion coupled to the rear side of the base body **100**.

(92) That is, the worker first installs the hanger-type jumper wire supporting member **400** on the electric wire L or the suspension insulator, and then couples the rear side of the trap-type live wire terminal insulation cap C to the hanger-type jumper wire supporting member **400**. Otherwise, after the worker couples the insulation rope **420** to the rear side of the trap-type live wire terminal insulation cap C of the present disclosure, then installs the hanger-type jumper wire supporting member **400** by hanging the coupling ring **410** on the electric wire L having tension or the suspension insulator, and then inserts and fixes the terminal of the cut jumper wire W to the rear body **110** of the trap-type live wire terminal insulation cap C of the present disclosure.

(93) However, in the latter case, when the trap-type live wire terminal insulation cap C is first installed on the insulation rope **420**, it may be difficult to install the hanger-type jumper wire supporting member **400** since the overall load is increased or the center of gravity is positioned at the trap-type live wire terminal insulation cap C, so that it is preferable that the coupling ring **410** is hung and installed first.

(94) Meanwhile, in the hanger-type jumper wire supporting member **400**, when the coupling ring **410** is installed on the electric wire L having tension or the suspension insulator, the separation prevention lever **414** is rotated or is automatically rotated after the coupling ring **410** is hung and installed on the electric wire L having tension or the suspension insulator in order to maintain a state in which the hanger-type jumper wire supporting member **400** is stably installed on the electric wire L having tension or the suspension insulator, so that a lower portion of the electric wire L having tension or a lower portion of the suspension insulator is surrounded, thereby preventing the coupling ring **410** from being separated from the electric wire L having tension or the suspension insulator.

(95) In addition, the coupling ring **410** includes: the first hook **412** having an upper inner side provided with the first hanging groove into which the electric wire L having tension or the suspension insulator is capable of being inserted and hung, the first hook **412** having a first side surface provided with a rail groove **412a** formed in an arc shape and having an upper rear side opened, and the first hook **412** being coupled to an upper portion of the insulation rope **420**; the separation prevention lever **414** having an upper terminal opened such that the second hanging groove (not shown) corresponding to the first hanging groove of the first hook **412** is formed, the separation prevention lever **414** having an upper portion formed in a shape corresponding to a shape of the rail groove **412a** of the first hook **412** and coupled to the rail groove **412a** such that the separation prevention lever **414** is capable of being rotated along the rail groove **412a**, and the separation prevention lever **414** having a lower portion that protrudes toward the opened upper rear side of the first hook **412**; and the second hook **416** having the third hanging groove (not shown) corresponding to the first hanging groove of the first hook **412**, the second hook **416** being coupled to the first side surface of the first hook **412** and closing a first side of the rail groove **412a** of the first hook **412** and a first side of the opened upper rear side of the first hook **412**.

(96) That is, the separation prevention lever **414** is configured such that the upper portion of the separation prevention lever **414** rotated along the rail groove **412a** of the first hook **412** and opened is moved toward the opened lower portion of the first hanging groove so that the electric wire L

having tension or the suspension insulator is capable of being hung in the first hanging groove, and then the separation prevention lever **414** is rotated in an opposite direction along the rail groove **412a** of the first hook **412** so that the opened lower portion of the first hanging groove is closed and the electric wire L having tension or the suspension insulator is surrounded in the upper portion of the second hanging groove, thereby maintaining a state in which the coupling ring **410** is stably coupled to the jumper wire W having tension.

(97) At this time, in order to easily close the opened lower portion of the first hanging groove by rotating the separation prevention lever **414**, in the first hook **412**, it is preferable that the front side of a middle end that corresponds to the rear side of the first hanging groove is opened and the rear side of the opened upper portion of the first hook **412** extends and is opened to the rear side of the middle end. This is to more smoothly rotate the separation prevention lever **414** along the rail groove **412a** so as to close or open the first hanging groove.

(98) In addition, the first hook **412** limits a rotation angle formed when the separation prevention lever **414** is rotated to open the first hanging groove by an upper step (not shown) formed by the rear side of the upper portion of the first hook **412**, and limits a rotation angle formed when the separation prevention lever **414** is rotated to close the first hanging groove by a lower step (not shown) formed by the rear side of the middle end of the first hook **412**.

(99) At this time, a gripping hole (not shown) is formed on a lower portion thereof so that worker can smoothly grip the separation prevention lever **414** and may rotate the separation prevention lever **414** along the rail groove **412a** of the first hook **412** and also may easily grip the coupling ring **410**. Furthermore, when the worker hangs and installs the coupling ring **410** on the jumper wire W having tension, the gripping hole allows the lower portion of the separation prevention lever **414** to be smoothly rotated upward and also the coupling ring **410** is moved upward while the worker moves the gripping hole upward by using the insulation stick and so on, so that the coupling ring **410** is capable of being more easily installed on the electric wire W having tension or the suspension insulator.

(100) In addition, in the coupling ring **410**, in order to realize more stable rotation and to limit the rotation angle of the separation prevention lever **414**, auxiliary rail grooves are formed on the first side surface of the first hook **412** and a second side surface of the second hook **416**.

(101) In more detail, the first hook **412** includes a first auxiliary rail groove **412b** which is formed in the first side surface of the first hook **412** and which is formed in the upper portion of the rail groove **412a** in an arc shape, and the separation prevention lever **414** includes an auxiliary protrusion **414a** which protrudes on a first side surface and a second side surface of the upper portion of the separation prevention lever **414** and which protrudes such that the auxiliary protrusion **414a** is inserted into the first auxiliary rail groove **412b**.

(102) At this time, the first auxiliary rail groove **412b** is formed in an arc shape such that the first auxiliary rail groove **412b** has a length from a position of the auxiliary protrusion **414a** at a position where a rotation of the separation prevention lever **414** is limited by the upper step to a position of the auxiliary protrusion **414a** where the rotation of the separation prevention lever **414** is limited by the lower step when the separation prevention lever **414** is rotated upward or downward.

(103) In addition, as described above, a protrusion position of the auxiliary protrusion **414a** is positioned in response to the positions in which upward or downward rotation of the separation prevention lever **414** is limited, and is positioned at a position where the rotation of the separation prevention lever **414** is capable of being limited by the first auxiliary rail groove **412b**.

(104) In addition, the hanger-type jumper wire supporting member **400** may include a quick link **430** coupled to the lower portion of the insulation rope **420**. Furthermore, the quick link **430** is formed of a one-touch-type ring called a karabiner, and realizes an effect of easily coupling the rear side of the trap-type live wire terminal insulation cap of the present disclosure.

(105) Furthermore, in order to couple the trap-type live wire terminal insulation cap C of the present disclosure, tying a knot of a lower terminal of the insulation rope **420** is required to be

performed, but it is difficult to perform.

(106) Therefore, it is preferable to couple the rear side of the trap-type live wire terminal insulation cap C of the present disclosure by using the quick link **430** as described above.

(107) At this time, the trap-type live wire terminal insulation cap C of the present disclosure is capable of being moved freely by the insulation rope **420**, so that the fixing of the cut jumper wire W may be more smoothly performed. Furthermore, the hanger-type jumper wire supporting member **400** is capable of being easily installed on the jumper wire W having tension, the suspension insulator, or the crossarm in the shape of '□' or 'L' by using the coupling ring **410**.

(108) The crossarm-type jumper wire supporting member **500** has an upper portion coupled to a single-type crossarm having a curved upper surface or a square crossarm having a rectangular cross-sectional shape among the crossarms S, and at least one of both sides thereof is coupled to the rear side of the trap-type live wire terminal insulation cap C of the present disclosure, i.e., the rear side of the base body **100**.

(109) Specifically, the crossarm-type jumper wire supporting member **500** includes: the base frame **510** having a length in the vertical direction; the fixing part **520** coupled to an upper portion of the base frame **510** and installed on the crossarm S; and the position adjustment part **530** slidably coupled to the base frame **510** and coupled to the rear side of the trap-type live wire terminal insulation cap C of the present disclosure, i.e., rear side of the base body **100**. That is, the position adjustment part **530** is coupled to the rear side of the base body **100** such that the coupling part **113** of the rear body **110** is capable of being rotated.

(110) In order to reduce the load, a hollow is formed inside the base frame **510**, and the fixing part **520** is fixed and installed on the square crossarm or the single-type crossarm. Furthermore, after the position adjustment part **530** is coupled such that the rear side of the trap-type live wire terminal insulation cap C of the present disclosure is capable of being rotated, a position of the trap-type live wire terminal insulation cap C is capable of being adjusted by moving the position adjustment part **530** along the base frame **510**, thereby being capable of realizing an effect of smoothly fixing the cut jumper wire W.

(111) The fixing part **520** includes the coupling part **521** having a front side opened such that the crossarm S is capable of being inserted into the opened front side and fixed, the coupling part **521** being formed on the upper and lower portions of the fixing part **520** so as to be coupled to the upper portion of the base frame **510**. Furthermore, the trap-type live wire terminal insulation cap C of the present disclosure is capable of being positioned at the upper or lower portions of the crossarm S by using the coupling part **521**.

(112) That is, in a situation in which the fixing part **520** is coupled to the upper portion of the base frame **510** through the coupling part **521** that is formed on the lower portion of the fixing part **520**, when the fixing part **520** is coupled to the crossarm S, the base frame **510** is positioned below the crossarm S and the trap-type live wire terminal insulation cap C of the present disclosure is positioned below the crossarm S. Furthermore, in a situation in which the fixing part **520** is coupled to the lower portion of the base frame **510** through the coupling part **521** formed on the upper portion of the fixing part **520**, when the fixing part **520** is coupled to the crossarm S, the base frame **510** is positioned above the crossarm S and the trap-type live wire terminal insulation cap C of the present disclosure is positioned above the crossarm S.

(113) At this time, the fixing part **520** includes the lower supporting member **522** coupled to the rear side of the fixing part **520**, and includes the first tightening device **523** which is hinge-coupled to the rear lower portion of the fixing part **520** and which has an upper portion hinge-coupled to the rear side of the lower supporting member **522** and configured to move the lower supporting member **522** up and down. Furthermore, after the crossarm S is inserted into the opened front side of the fixing part **520**, there is an effect of firmly fixing the lower supporting member **522** to the crossarm S by using the first tightening device **523** such that the lower supporting member **522** is rotated upward.

(114) That is, when the crossarm S is inserted into the opened front side of the fixing part **520**, the lower supporting member **522** is rotated downward by using the first tightening device **523** so that the crossarm S is smoothly inserted into the fixing part **520**, and then the lower supporting member **522** is rotated upward by using the first tightening device **523**, thereby firmly fixing the lower supporting member **522** to the crossarm S.

(115) At this time, the first tightening device **523** is a 'RELEASE DIRECTION OVERLOAD PREVENTION CLUTCH TYPE FASTENING DEVICE' which is Korean Patent No. 10-2082150 filed and registered by the applicant of the present disclosure. Furthermore, the first tightening device **523** is capable of rotating the lower supporting member **522** up and down by being operated with an insulation stick and so on. Furthermore, when the lower supporting member **522** is rotated downward, the first tightening device **523** prevents the crossarm-type jumper wire supporting member **500** from being rapidly separated from the crossarm S due to overload, thereby realizing an effect of safely finishing insulating work.

(116) In addition, the fixing part **520** may include the square crossarm fixing member **524** having the upper portion thereof coupled to the inner upper portion of the fixing part **520**. Unlike the single-type crossarm, since the upper surface of the square crossarm is not formed in a curved shape, a lower surface of the square crossarm fixing member **524** is formed horizontally. That is, if necessary, the fixing part **520** is installed such that the square crossarm fixing member **524** is detached from or attached to the fixing part **520** according to the single-type crossarm and the square crossarm, so that work efficiency may be increased.

(117) The position adjustment part **530** not only adjusts a vertical position of the trap-type live wire terminal insulation cap C of the present disclosure by being slidably moved along the base frame **510**, but also couples the rear side of the trap-type live wire terminal insulation cap C such that the rear side of the trap-type live wire terminal insulation cap C is capable of being rotated, so that an angle of the trap-type live wire terminal insulation cap C is capable of being adjusted, thereby being capable of realizing an effect of smoothly fixing the cut jumper wire W.

(118) At this time, the position adjustment part **530** includes the moving body **531** slidably coupled to the base frame **510**, the locking part **532** installed on the rear side of the moving body **531** and configured to fix or release the sliding movement of the moving body **531**, and the coupling protrusion **533** that protrudes on the front surface of the moving body **531**, the coupling protrusion **533** being coupled such that the base body **100** of the trap-type live wire terminal insulation cap C is capable of being rotated. That is, the coupling protrusion **533** is coupled such that the rear side of the rear body **110** is capable of being rotated.

(119) In addition, as another embodiment in which the trap-type live wire terminal insulation cap C of the present disclosure is coupled to the coupling protrusion **533**, a first end of an insulation rope (not shown) is fixed to the coupling protrusion **533** as illustrated in FIG. 27, and the base body **100** of the trap-type live wire terminal insulation cap C, i.e., the rear side of the rear body **110**, is coupled to a second end of the insulation rope, so that the trap-type live wire terminal insulation cap C is capable of being more freely used.

(120) The moving body **531** is coupled to the base frame **510** by surrounding the base frame **510** such that the moving body **531** is capable of being slid on the base frame **531**, and is slid and then fixed after a position of the moving body **531** is adjusted by the locking part **532**, so that the vertical position of the trap-type live wire terminal insulation cap C that has the rear side coupled by the coupling protrusion **533** which protrudes on the front surface of the moving body **531** is adjusted.

(121) At this time, the locking part **532** includes a fixing block **532a** which is installed on an inner rear side of the moving body **51** and which has a front surface in close contact with or spaced apart from a first side surface of the base frame **510**, a link bar **532b** which has a front side inserted into and coupled to a rear side of the fixing block **532a** and which has a front side thereof provided with a hinge hole (not shown) such that the front side of the link bar **532b** is hinge-coupled to the rear

side of the fixing block **532a** toward a hinge shaft (not shown), the link bar **532b** being formed in a long hole shape such that the hinge hole at the front side of the link bar **532b** has a length in the front and rear directions, an adjustment ring **532c** having a front side thereof inserted into and installed in the rear side of the moving body **531** such that the front side of the adjustment ring **532c** is hinge-coupled to and installed in the moving body **531**, the adjustment ring **532c** being configured to move the fixing block **532a** rearward by moving the rear side of the link bar **532b** in upper rearward or a lower rearward as the adjustment ring **532c** is rotated while a front terminal of the adjustment ring **532c** is hinge-coupled to the rear side of the link bar **532b**, and a pressing elastic member **532d** installed in an inner rear side of the moving body **531** and configured to elastically support the fixing block **532a**.

(122) In addition, the fixing block **532a** includes a packing **532a-1** which protrudes and which is installed in the front side of the fixing block **532a**, and the packing **532a-1** is configured to be in close contact with the rear surface of the base frame **510** as the pressing block **532a** is pressed, thereby fixing the position of the position adjustment part **530** after the position adjustment part **530** is slid along the base frame **510**.

(123) That is, as the locking part **532** is pressed by the pressing elastic member **532d** so that the packing **532a-1** is in close contact with the rear surface of the base frame **510**, the position adjustment part **530** is fixed to the base frame **510**. Furthermore, when the position adjustment part **530** is moved upward, the fixing block **532a** is moved rearward through the link bar **532b** by rotating the adjustment ring **532c** upward, the packing **532a-1** is spaced apart from the rear surface of the base frame **510**, thereby being capable of adjusting the position of the position adjustment part **530**.

(124) At this time, when the locking part **532** is rotated in either an upper direction or a lower direction, the fixing block **532a** is moved rearward. Therefore, as the worker rotates the adjustment ring **532c** upward, the position adjustment part **530** may be naturally moved upward. Furthermore, as the worker rotates the adjustment ring **532c** downward, the position adjustment part **530** may be naturally moved downward.

(125) In other words, the position adjustment part **530** is slidably moved upward or downward and then is fixed by the locking part **432**, so that the vertical direction of the trap-type live wire terminal insulation cap C of the present disclosure is capable of being adjusted.

(126) The coupling protrusion **533** is formed in a shape corresponding to the rear side of the base frame **100**. That is, the coupling protrusion **533** is formed in a shape corresponding to the coupling hole **113a** of the coupling part **113** that is formed in the rear side of the rear body **110**. Therefore, in order to the angle of the trap-type live wire terminal insulation cap C of the present disclosure to be smoothly adjusted and to be rotated freely, the coupling protrusion **533** is formed in a cylindrical shape, and a bearing may be additionally installed on an outer circumference of the coupling protrusion **533**. At this time, it is obvious that the coupling hole **113a** is also formed in a cylindrical shape that is a shape corresponding to the shape of the coupling protrusion **533** or the shape of the coupling protrusion **533** on which the bearing is installed.

(127) In addition, the coupling protrusion **533** includes the pair of coupling protrusions **533** that protrudes on the both sides of the rear surface of the moving body **531** such that the trap-type live wire terminal insulation cap C of the present disclosure is coupled to the both sides of the front side of the position adjustment part **530**, so that a pair of cut jumper wires W is capable of being smoothly fixed to the trap-type live wire terminal insulation cap C, thereby realizing an effect of insulating and protecting the jumper wires W.

(128) In addition, the position adjustment part **530** includes a protrusion part (not shown) which protrudes on an upper portion of the front surface of the moving body **531** and which has a lower surface formed in a 'v' shape. Furthermore, the coupling protrusion **533** is formed such that the coupling protrusion **533** is positioned at a lower portion of the protrusion part, and the protrusion part is configured to limit the upward rotation of the trap-type live wire terminal insulation cap C

coupled to the coupling protrusion 533, so that work is capable of being smoothly performed and allows the upper wire fixing member 534 to be spaced apart from the front side of the position adjustment part 530.

(129) In relation to the description described above, the position adjustment part 530 includes the upper wire fixing member 534 having an upper portion of a first side surface thereof coupled to the protrusion part, i.e., the upper portion of the front surface of the moving body 531 such that the upper portion of the first surface of the upper wire fixing member 534 is capable of being rotated, the upper wire fixing member 534 having a front side of a lower surface thereof provided with the upper accommodating groove 534a in which the jumper wire W is capable of being accommodated, the second tightening device 535 having an upper portion which penetrates a rear side of the lower surface of the upper wire fixing member 534 and which is screw-coupled to the upper wire fixing member 534, and the lower wire fixing member 536 having a rear side through which the second tightening device 535 penetrates and to which the second tightening device 535 is screw-coupled, the lower wire fixing member 536 being installed spaced apart from a lower portion of the upper wire fixing member 534, and the lower wire fixing member 536 having a front side of an upper surface thereof provided with the lower accommodating groove 536a in which the jumper wire W is capable of being accommodated.

(130) The upper wire fixing member 534, the second tightening device 535, and the lower wire fixing member 536 accommodate and fix the jumper wire W in the upper accommodating groove 534a and the lower accommodating groove 536a before the jumper wire W is cut, or accommodate and fix the jumper wire W that is not cut, thereby being capable of realizing an effect of smoothly performing new installation, replacement, or repair of an electric wire.

(131) At this time, as described above, the upper wire fixing member 534 is installed spaced apart from the front surface of the position adjustment part 530, i.e., the upper wire fixing member 534 is installed spaced apart from the front surface of the moving body 531, so that the trap-type live wire terminal insulation cap C of the present disclosure is capable of being smoothly coupled to the coupling protrusion 533 and is coupled such that the trap-type live wire terminal insulation cap C is capable of being rotated around the position adjustment part 530. Therefore, before the trap-type live wire terminal insulation cap C of the present disclosure is installed, the upper wire fixing member 534 is rotated such that the front side of the coupling protrusion 533 is opened, and then the upper wire fixing member 534 is rotated and positioned at an original position after the trap-type live wire terminal insulation cap C of the present disclosure is installed, thereby preventing the trap-type live wire terminal insulation cap C installed in the coupling protrusion 533 from being separated.

(132) In relation to the description described above, in the upper wire fixing member 534, the second tightening device 535, and the lower wire fixing member 536, when the second tightening device 535 is rotated and the second tightening device 535 is moved to an upper portion of the upper wire fixing member 534, the lower wire fixing member 536 is also moved upward at the same time. Therefore, as a separation distance between the upper accommodating groove 534a and the lower accommodating groove 536a is reduced, the jumper wire W is accommodated between the upper accommodating groove 534a and the lower accommodating groove 536a and is fixed.

(133) That is, in brief, the lower wire fixing member 536 is moved upward as the second tightening device 535 is rotated, so that the jumper wire W accommodated between the upper accommodating groove 534a and the lower accommodating groove 536a is fixed or released. At this time, similar to the first tightening device 523, the second tightening device 535 is rotated by using an insulation stick and so on, thereby being capable of moving the lower wire fixing member 536 upward.

(134) In addition, the position adjustment part 530 includes the rotation adjustment part 537 that protrudes on the lower portion of the front surface of the moving body 531, and the rotation adjustment part 537 is configured to limit the rotation of the trap-type live wire terminal insulation cap C of the present disclosure as same as the protrusion part that is described above. That is, the

rotation adjustment part **537** is configured to limit a downward rotation of the trap-type live wire terminal insulation cap C, so that work is smoothly performed.

(135) Meanwhile, it is preferable that the upper wire fixing member **534** is coupled to the position adjustment part **530**, i.e., the upper wire fixing member **534** is coupled to the front surface of the moving body **531** such that the upper wire fixing member **534** is capable of being rotated, and is configured to fix a rotation angle after the rotation angle is adjusted. This is to more smoothly and flexibly fix the jumper wire W to the upper accommodating groove **534a**, in which the jumper wire W is rotated together with the lower wire fixing member **536** and is not cut.

(136) In addition, in describing a configuration that fix the rotation angle after adjusting an angle of the upper wire fixing member **534** by rotating the upper wire fixing member **534**, the configuration includes the rotation adjustment part **537** which protrudes on the lower portion of the front surface of the moving body **531** and in which the penetration hole **537a** is formed in the vertical direction, and includes the rotation fixing member **538** which is inserted into and coupled to the lower portion of the penetration hole **537a** of the rotation adjustment part **537** and which is provided with the locking member **538a** configured to be moved upward and downward along the penetration hole **537a**. Furthermore, the upper wire fixing member **534** includes the angle adjustment groove **534d** including a plurality of angle adjustment grooves **534d** formed in the rear side of the lower surface of the upper wire fixing member **534** in the left and right directions, the angle adjustment grooves **534d** being configured such that the locking member **538a** of the rotation fixing member **538** is capable of being inserted and pulled.

(137) As described above, the rotation adjustment part **537** has the penetration hole **537a** and is configured to limit the downward rotation of the trap-type live wire terminal insulation cap C of the present disclosure. Furthermore, as the upper portion of the rotation fixing member **538** is coupled to the penetration hole **537a** and the locking member **538a** of the rotation fixing member **538** is moved upward, the upper portion of the locking member **538a** is inserted into any one of the angle adjustment grooves **534d** of the upper wire fixing member **534**, so that the upper wire fixing member **534** is fixed without rotation.

(138) In addition, the upward and downward movement of the locking member **538a** is performed when the worker rotates the locking member **538a** since the upper portion of the rotation fixing member **538** is coupled to the penetration hole **537a** of the rotation adjustment part **537** and the locking member **538a** penetrates the rotation fixing member **538** and the locking member **537a** is hinge-coupled to the rotation fixing member **538**.

(139) That is, after the locking member **538a** is in a state in which the locking member **538a** is moved downward or the locking member **538a** is rotated and moved downward by the worker, when the worker rotates the upper wire fixing member **534** and then the worker rotates the locking member **538a** and moves the locking member **538a** upward, the upper portion of the locking member **538a** is inserted into any one of the angle adjustment grooves **534d** formed in the rear lower surface of the upper wire fixing member **534**, thereby realizing the angle adjustment of the upper wire fixing member **534**.

(140) Meanwhile, as illustrated in FIG. 27 to FIG. 29, another embodiment of the crossarm-type jumper wire supporting member **500** may be provided. In another embodiment, the crossarm-type jumper wire supporting member **500** is provided with a wire tensioner ring **520a** so that a wire tensioner is prepared together by hanging a ring formed on the wire tensioner on the wire tensioner ring **520a**, and is provided with a wire tensioner coupling hole **520b**.

(141) Specifically, in another embodiment of the crossarm-type jumper wire supporting member **500**, the crossarm-type jumper wire supporting member **500** includes the base frame **510**, the fixing part **520**, and the position adjustment part **530** as same as in an embodiment, and further includes the wire tensioner ring **520a** provided on the upper surface of the fixing part **520**.

(142) As illustrated in FIG. 28, the wire tensioner ring **520a** has an effect that a ring of a wire tensioner is hung and coupled to the wire tensioner ring **520a** before the crossarm-type jumper wire

supporting member **500** is installed on the crossarm S, and has an effect that the wire tensioner is capable of being easily and conveniently used after the crossarm-type jumper wire supporting member **500** is installed on the crossarm S without additionally moving the wire tensioner upward. (143) In addition, as in an embodiment described above, the crossarm-type jumper wire supporting member **500** has the front side thereof opened, and includes a door **520c** hinge-coupled to the opened front side of the crossarm-type jumper wire supporting member **500** and configured to be opened and closed. Furthermore, after the crossarm S is inserted into the fixing part **520** of the crossarm-type jumper wire supporting member **500**, the door **520c** closes the opened front side and is fixed, so that the crossarm S is prevented from being separated, thereby realizing an effect of performing a safer work.

(144) In addition, as in the embodiment described above, the crossarm-type jumper wire supporting member **500** includes the coupling part **521** which is formed such that the coupling part **521** is coupled to the upper portion of the base frame **510** and which is formed on the rear side of the crossarm-type jumper wire supporting member **500**, and the trap-type live wire terminal insulation cap C of the present disclosure is capable of being positioned above or below the crossarm S by using the coupling part **521**.

(145) At this time, in a situation in which the coupling part **521** is coupled to the base frame **510** such that the trap-type live wire terminal insulation cap C of the present disclosure is positioned above the crossarm S, when the wire tensioner is hung and coupled to the wire tensioner ring **520a**, the wire tensioner is positioned at the front side of the fixing part **520**. Therefore, as the wire tensioner is positioned at the opened front side of the fixing part **520**, the crossarm-type jumper wire supporting member **500** may be difficult to be installed on the crossarm S due to the wire tensioner, so that the coupling part **521** may include the wire tensioner coupling hole **520b** to which the wire tensioner is capable of being hung and coupled such that the wire tensioner is positioned at the rear side of the fixing part **520**.

(146) In addition, the wire tensioner coupling hole **520b** is formed such that the wire tensioner coupling hole **520b** is positioned at the center of the coupling part **521**, so that the fixing part **520** is stably and firmly coupled to the base frame **510**. That is, the coupling part **521** is stably and firmly coupled to the base frame **510**.

(147) In addition, the fixing part **520** includes the first tightening device **523** which penetrates the lower portion of the fixing part **520** and which is screw-coupled and configured to be moved upward and downward, and the first tightening device **523** fixes the crossarm S, thereby realizing an effect of maintaining the crossarm-type jumper wire supporting member **500** to be firmly fixed to the crossarm S.

(148) That is, when the crossarm S is inserted into the inner side of the fixing part **520**, the first tightening device **523** moved downward. Then, after the crossarm S is inserted into the fixing part **520**, the first tightening device **523** is moved upward and is in close contact with the lower portion of the crossarm S and supports the crossarm S. At the same time, the first tightening device **523** presses the crossarm S upward so that the upper portion of the crossarm S is in close contact with the inner upper surface of the fixing part **520**, so that the crossarm-type jumper wire supporting member **500** is firmly installed on the crossarm S.

(149) In addition, as in the embodiment, the crossarm-type jumper wire supporting member **500** in another embodiment may include the square crossarm fixing member **524** having an upper portion thereof coupled to the inner upper portion of the fixing part **520**, so that the crossarm-type jumper wire supporting member **500** is capable of being installed on both the single-type crossarm and the square crossarm by using the square crossarm fixing member **524**.

(150) As a result, since the trap-type live wire terminal insulation cap C of the present disclosure is installed at a fixed position by using the hanger-type jumper wire supporting member **400** or the crossarm-type jumper wire supporting member **500**, the cut jumper wire W is fixed at a predetermined position and is wrapped, insulated, and protected, so that safety incidents caused by

high voltage current may be prevented and also work efficiency may be increased.

(151) Next, in describing the indirect live wire insulation method for the jumper wire using the trap-type live wire terminal insulation cap C, the method includes: the first preparation process S10 in which the hanger-type jumper wire supporting member 400 or the crossarm-type jumper wire supporting member 500 is installed around a jumper wire W that requires work, a second preparation process S20 in which the rear side of the trap-type live wire terminal insulation cap C is coupled to the hanger-type jumper wire supporting member 400 or the crossarm-type jumper wire supporting member 500, and the fastening process S40 in which the terminal of the jumper wire W that is cut is inserted into and fixed to the trap-type live wire terminal insulation cap C.

(152) Specifically, in the first preparation process S10, a worker determines whether any one of the jumper wire W which is required to be worked on and which is an electric wire L having tension around a jumper wire, a suspension insulator, or a crossarm S is capable of being used, and then the worker installs a pair of hanger-type jumper wire supporting members 400 or the crossarm-type jumper wire supporting member 500 on the electric wire L having tension, the suspension insulator, or the crossarm S. At this time, it is preferable that the hanger-type jumper wire supporting member 400 is installed according to a cutting part of the jumper wire W when the jumper wire W is cut.

(153) In the second preparation process S20, the rear side of the trap-type live wire terminal insulation cap C, i.e., the coupling part 113 formed at the rear side of the rear body 110 is coupled to the hanger-type jumper wire supporting member 400 or the crossarm-type jumper wire supporting member 500 installed in the first preparation process S10, and respective trap-type live wire terminal insulation caps C are installed on the pair of quick links 540 of the hanger-type jumper wire supporting members 400 or one or two trap-type live wire terminal insulation caps C are coupled to the coupling protrusion 533 of the crossarm-type jumper wire supporting member 500.

(154) At this time, the second preparation process S20 may further include a fixing process S25 in which the jumper wire W is fixed between the upper accommodating groove 534a and the lower accommodating groove 536b when one jumper wire W which does not require work but which is positioned around the jumper wire W that requires work so that one jumper wire W is required to be separately fixed exists while the crossarm-type jumper wire supporting member 500 is used.

(155) After then, the worker uses the insulation stick and so on so that one jumper wire W is in a safely and temporarily fixed state, and then the fastening process S40 is performed immediately.

(156) In the fastening process S40, terminals of the cut jumper wires W are inserted into and fixed to the pair of trap-type live wire terminal insulation caps C so that the cut jumper wires W are insulated and protected, in which the trap-type live wire terminal insulation caps C are the pair of trap-type live wire terminal insulation caps C installed on the pair of hanger-type jumper wire supporting members 400 or the pair of trap-type live wire terminal insulation caps C installed on the crossarm-type jumper wire supporting member 500 in the second preparation process S20.

(157) At this time, before the fastening process S40, a third preparation process S26 may be further included. In the third preparation process S26, the worker considers a length of the jumper wire W that is to be cut and considers a facing direction of the terminal of the jumper wire W after the jumper wire W is cut, and the worker adjusts a position of the trap-type live wire terminal insulation cap C.

(158) In addition, in the third preparation process S26, when the hanger-type jumper wire supporting member 400 is used, the worker sets positions of the pair of trap-type live wire terminal insulation caps C and sets directions of the opened front sides by using the insulation stick and so on.

(159) In addition, in the third preparation process S26, when the crossarm-type jumper wire supporting member 500 is used, the worker determines whether the cut electric wire is fixed to a position above or below the crossarm S, then the coupling part 521 formed on the upper portion of the lower portion of the fixing part 520 is coupled to the upper portion of the base frame 510, then

then the position adjustment part 530 is slidably moved along the base frame 510 so as to adjust the position, and then the worker rotates the pair of trap-type live wire terminal insulation caps C upward by using the insulation stick and so on, thereby setting the positions and the opened front sides of the trap-type live wire terminal insulation caps C. At this time, the worker may require a number of workers in order to improve the safety of the high voltage current.

(160) The foregoing is specific description of the technical features of the present disclosure for the preferred embodiments of the present disclosure. In addition, those skilled in the art will appreciate that various modifications, additions and substitutions are possible, without departing from the scope and spirit of the present disclosure.

Claims

1. A trap-type live wire terminal insulation cap comprising: a base body (100) into which a terminal of a jumper wire (W) is inserted, the base body (100) having a front side of an outer circumference provided with a plurality of operation holes (112) formed therethrough; a plurality of gripping members (200) having front sides thereof hinge-coupled to the operation holes (112) of the base body (100), the gripping members (200) having respective links (210) that protrude on front side upper portions of the gripping members (200); an operation head (300) slidably coupled to the front side of the outer circumference of the base body (100) such that the operation head (300) is elastically supported rearward, the operation head (300) which has a front surface provided with respective operation grooves (310) corresponding to the operation holes (112) and to which the links (210) of the gripping members (200) are hinge-coupled to the operation grooves (310); and a hanger-type jumper wire supporting member (400) having an upper portion coupled to an electric wire (L) having tension or to a suspension insulator and having a lower portion to which a rear side of the base body (100) is coupled.
2. The trap-type live wire terminal insulation cap of claim 1, wherein the base body (100) comprises: a rear body (110) into which the terminal of the jumper wire (W) is inserted and which has a front side of an outer circumference provided with the plurality of operation holes (112) formed therethrough; and a front body (120) into which a front side of the rear body (110) is inserted and coupled, the front body (120) having a rear surface provided with a plurality of installation grooves (122) so as to be positioned outside the rear body (110), and the front body (120) being provided with respective elastic members (124) installed in the installation grooves (122), wherein the operation head (300) comprises an elastic supporting part (320) which protrudes on an outer circumference of the operation head (300) and which supports rear sides of the elastic members (124).
3. The trap-type live wire terminal insulation cap of claim 1, wherein the gripping members (200) comprise respective teeth parts (220) formed on rear lower surfaces of the gripping members (200).
4. The trap-type live wire terminal insulation cap of claim 3, wherein the teeth parts (220) are formed in curved shapes.
5. The trap-type live wire terminal insulation cap of claim 1, wherein the hanger-type jumper wire supporting member (400) comprises: a coupling ring (410) having an upper portion hung and coupled to the electric wire (L) having tension or to the suspension insulator; and an insulation rope (420) having an upper portion coupled to a lower portion of the coupling ring (410) and having a lower portion coupled to the rear side of the base body (100).
6. The trap-type live wire terminal insulation cap of claim 5, wherein the coupling ring (410) comprises: a first hook (412) having an upper inner side provided with a first hanging groove into which the electric wire (L) having tension or the suspension insulator is capable of being inserted and hung, the first hook (412) having a first side surface provided with a rail groove (412a) formed in an arc shape and having an upper rear side opened; a separation prevention lever (414) having an upper terminal opened such that a second hanging groove corresponding to the first hanging groove

of the first hook (412) is formed, the separation prevention lever (414) having an upper portion formed in a shape corresponding to a shape of the rail groove (412a) of the first hook (412) and coupled to the rail groove (412a) such that the separation prevention lever (414) is capable of being rotated along the rail groove (412a), and the separation prevention lever (414) having a lower portion that protrudes toward the opened upper rear side of the first hook (412); and a second hook (416) having a third hanging groove corresponding to the first hanging groove of the first hook (412), the second hook (416) being coupled to the first side surface of the first hook (412) and closing a first side of the rail groove (412a) of the first hook (412) and a first side of the opened upper rear side of the first hook (412).

7. An indirect live wire insulation method for a jumper wire, the method using the trap-type live wire terminal insulation cap (C) of claim 1, and the method comprising: a first preparation process (S10) in which the hanger-type jumper wire supporting member (400) or the crossarm-type jumper wire supporting member (500) is installed around the jumper wire (W) that requires work; a second preparation process (S20) in which a rear side of the trap-type live wire terminal insulation cap (C) is coupled to the hanger-type jumper wire supporting member (400) or the crossarm-type jumper wire supporting member (500); a cutting process S30 in which the jumper wire W that requires work is cut; and a fastening process (S40) in which a terminal of the jumper wire (W) that is cut is inserted into and fixed to the trap-type live wire terminal insulation cap (C).

8. A trap-type live wire terminal insulation cap comprising: a base body (100) into which a terminal of a jumper wire (W) is inserted, the base body (100) having a front side of an outer circumference provided with a plurality of operation holes (112) formed therethrough; a plurality of gripping members (200) having front sides thereof hinge-coupled to the operation holes (112) of the base body (100), the gripping members (200) having respective links (210) that protrude on front side upper portions of the gripping members (200); an operation head (300) slidably coupled to the front side of the outer circumference of the base body (100) such that the operation head (300) is elastically supported rearward, the operation head (300) which has a front surface provided with respective operation grooves (310) corresponding to the operation holes (112) and to which the links (210) of the gripping members (200) are hinge-coupled to the operation grooves (310); and a crossarm-type jumper wire supporting member (500) having an upper portion coupled to a crossarm(S) and to which a rear side of the base body (100) is coupled to at least one of both sides of the crossarm-type jumper wire supporting member (500).

9. The trap-type live wire terminal insulation cap of claim 8, wherein the base body (100) comprises: a rear body (110) into which the terminal of the jumper wire (W) is inserted and which has a front side of an outer circumference provided with the plurality of operation holes (112) formed therethrough; and a front body (120) into which a front side of the rear body (110) is inserted and coupled, the front body (120) having a rear surface provided with a plurality of installation grooves (122) so as to be positioned outside the rear body (110), and the front body (120) being provided with respective elastic members (124) installed in the installation grooves (122), wherein the operation head (300) comprises an elastic supporting part (320) which protrudes on an outer circumference of the operation head (300) and which supports rear sides of the elastic members (124).

10. The trap-type live wire terminal insulation cap of claim 8, wherein the gripping members (200) comprise respective teeth parts (220) formed on rear lower surfaces of the gripping members (200).

11. The trap-type live wire terminal insulation cap of claim 10, wherein the teeth parts (220) are formed in curved shapes.

12. The trap-type live wire terminal insulation cap of claim 8, wherein the crossarm-type jumper wire supporting member (500) comprises: a base frame (510) having a length in a vertical direction; a fixing part (520) coupled to an upper portion of the base frame (510) and installed on the crossarm(S); and a position adjustment part (530) slidably coupled to the base frame (510) and coupled to the base frame (510) such that the rear side of the base body (100) is capable of being

rotated.

13. The trap-type live wire terminal insulation cap of claim 12, wherein the fixing part (520) comprises a coupling part (521) having a front side opened, the coupling part (521) being formed on an upper portion and a lower portion of the fixing part (520) so as to be coupled to the upper portion of the base frame (510).

14. The trap-type live wire terminal insulation cap of claim 12, wherein the fixing part 520 comprises: a lower supporting member (522) hinge-coupled to a rear side of the fixing part (520); and a first tightening device (523) hinge-coupled to a rear lower portion of the fixing part (520), the first tightening device (523) having an upper portion hinge-coupled to a rear side of the lower supporting member (522) and being configured to move the lower supporting member (522) up and down.

15. The trap-type live wire terminal insulation cap of claim 12, wherein the fixing part (520) comprises a square crossarm fixing member (524) having an upper portion coupled to an inner upper portion of the fixing part (520).

16. The trap-type live wire terminal insulation cap of claim 12, wherein the position adjustment part (530) comprises: a moving body (531) slidably coupled to the base frame (510); a locking part (532) installed on a rear side of the moving body (531) and configured to fix or release a sliding movement of the moving body (531); and a coupling protrusion (533) that protrudes on a front surface of the moving body (531), the coupling protrusion (533) being coupled such that the rear side of the base body (100) is capable of being rotated.

17. The trap-type live wire terminal insulation cap of claim 16, wherein the coupling protrusion (533) comprises a pair of coupling protrusions (533) that protrudes from both sides of a rear surface of the moving body (531).

18. The trap-type live wire terminal insulation cap of claim 16, wherein the position adjustment part (530) comprises: an upper wire fixing member (534) having an upper portion of a rear surface thereof coupled to an upper portion of a front surface of the moving body (531) such that the upper wire fixing member (534) is capable of being rotated, the upper wire fixing member (534) having a front side of a lower surface provided with an upper accommodating groove (534a) in which the jumper wire (W) is capable of being accommodated; a second tightening device (535) having an upper portion which penetrates a rear side of the lower surface of the upper wire fixing member (534) and which is screw-coupled to the upper wire fixing member (534); and a lower wire fixing member (536) having a rear side through which the second tightening device (535) penetrates and to which the second tightening device (535) is screw-coupled, the lower wire fixing member (536) being installed spaced apart from a lower portion of the upper wire fixing member (534), and the lower wire fixing member (536) having a front side of an upper surface provided with a lower accommodating groove (536a) in which the jumper wire (W) is capable of being accommodated.

19. The trap-type live wire terminal insulation cap of claim 18, wherein the position adjustment part (530) comprises: a rotation adjustment part (537) which protrudes on a lower portion of the front surface of the moving body (531) and in which a penetration hole (537a) is formed in the vertical direction; and a rotation fixing member (538) which is inserted into and coupled to a lower portion of the penetration hole (537a) of the rotation adjustment part (537) and which is provided with a locking member (538a) configured to be moved upward and downward along the penetration hole (537a), wherein the upper wire fixing member (534) comprises an angle adjustment groove (534d) comprising a plurality of angle adjustment grooves (534d) formed in the rear side of the lower surface of the upper wire fixing member (534) in left and right directions, the angle adjustment grooves (534d) being configured such that the locking member (538a) of the rotation fixing member (538) is capable of being inserted and pulled.
