ITEM OPPORTUNITY SYNOPSIS:

Conduit Cutting Tool

2021-014

Supplier Scouting Number

TECHNICAL INFORMATION:

1. Describe the Item:

Please describe the item application/ the end use of item.

Conduit Cutting tool Used to safely cut PVC and PE duct with live wires inside the Pipe

Provide the item number if applicable: (N95 Mask vs Protective Mask).

US Patent# 9,707,691 B2

2. Summary of Technical Specifications and Performance Requirements:

a. Provide dimensions / size / tolerances / performance specifications for the item.

Please Refer to US Patent attached

b. List required materials needed to make the product, Including materials of product components, if applicable.

Please Refer to US Patent attached. Mild Steel and Blades,Company is open to the material

c. Are there applicable certification requirements to supply this item? (i.e. ISO certification) Are there any applicable regulations that apply to the production of this item? (i.e. FDA regulations or EPA regulations) Are there any other standard requirements? (i.e. ASME Standard, IEEE Standard) Please specify.

N/A

d. Describe the manufacturing processes (elaborate to provide as much detail as possible).

The material will be stamped out, Blades will need to be cut to size and placed on the unit. Blades will need to interchangeable.

f. Additional Comments:
Is there other information that would impact the item's performance or usefulness? Please explain.

Possible Improvement to keep continuous grip on pipe, also a better blade may be utilized.

BUSINESS INFORMATION:		**Potential Business Volume Estimate (i.e., # Units Per Day, Month, Year):**
		200 to 300 per day. Blades will need to be changed out periodically
		Target Price / Unit Cost Information:
		$9 per unit
	Delivery Requirements:	**When is it needed by? (Immediate, 30 Days, 6 months, etc.)**
		First sample run in 30 days of being matched with supplier.
		Describe packaging requirements (i.e., individually/ group packaging).
		Single packaging supply house shelf ready
		Where is this opportunity located? Is there a preferred shipping proximity - if applicable?
		Products will be shipped to a central locations and distributed to electrical supply dealers world wide
Additional Comments:		**How long would you like to leave this opportunity open to the National Network?**
		☐ **3 days** ☐ **5 days** ☐ **7 days** ☐ **10 days** 6 months **Other**
		Is there other information you would like to include?
		20 Conduit cutting unit have have been utilized in the field. This unit brings a great deal of safety when cutting into pipes with live electrical conductors and communication conductor inside the vessel. This tool has unlimited potential in regards to quantity needed

Photos or diagrams of the item (helpful but not required).

The United States of America

The Director of the United States Patent and Trademark Office

Has received an application for a patent for a new and useful invention. The title and description of the invention are enclosed. The requirements of law have been complied with, and it has been determined that a patent on the invention shall be granted under the law.

Therefore, this

United States Patent

Grants to the person(s) having title to this patent the right to exclude others from making, using, offering for sale, or selling the invention throughout the United States of America or importing the invention into the United States of America, and if the invention is a process, of the right to exclude others from using, offering for sale or selling throughout the United States of America, or importing into the United States of America, products made by that process, for the term set forth in 35 U.S.C. 154(a)(2) or (c)(1), subject to the payment of maintenance fees as provided by 35 U.S.C. 41(b). See the Maintenance Fee Notice on the inside of the cover.

Joseph Matal

Performing the Functions and Duties of the

Under Secretary of Commerce for Intellectual Property and

Director of the United States Patent and Trademark Office

MAINTENANCE FEE NOTICE

If the application for this patent was filed on or after December 12, 1980, maintenance fees are due three years and six months, seven years and six months, and eleven years and six months after the date of this grant, or within a grace period of six months thereafter upon payment of a surcharge as provided by law. The amount, number and timing of the maintenance fees required may be changed by law or regulation. Unless payment of the applicable maintenance fee is received in the United States Patent and Trademark Office on or before the date the fee is due or within a grace period of six months thereafter, the patent will expire as of the end of such grace period.

PATENT TERM NOTICE

If the application for this patent was filed on or after June 8, 1995, the term of this patent begins on the date on which this patent issues and ends twenty years from the filing date of the application or, if the application contains a specific reference to an earlier filed application or applications under 35 U.S.C. 120, 121, 365(c), or 386(c), twenty years from the filing date of the earliest such application ("the twenty-year term"), subject to the payment of maintenance fees as provided by 35 U.S.C. 41(b), and any extension as provided by 35 U.S.C. 154(b) or 156 or any disclaimer under 35 U.S.C. 253.

If this application was filed prior to June 8, 1995, the term of this patent begins on the date on which this patent issues and ends on the later of seventeen years from the date of the grant of this patent or the twenty-year term set forth above for patents resulting from applications filed on or after June 8, 1995, subject to the payment of maintenance fees as provided by 35 U.S.C. 41(b) and any extension as provided by 35 U.S.C. 156 or any disclaimer under 35 U.S.C. 253.

US009707691B2

(12) **United States Patent**
Lindstrom et al.

(10) **Patent No.: US 9,707,691 B2**
(45) **Date of Patent: Jul. 18, 2017**

(54) **CONDUIT CUTTING TOOLS AND CONDUIT CUTTING TOOL OPERATIONAL METHODS**

(71) Applicant: **RL Tools, L.L.C.**, Clinton, MT (US)

(72) Inventors: **Paul Lindstrom**, Clinton, MT (US); **Mike Raunig**, Missoula, MT (US); **Chris Loraas**, Bismarck, ND (US)

(73) Assignee: **RL Tools, L.L.C.**, Clinton, MT (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 341 days.

(21) Appl. No.: **14/145,231**

(22) Filed: **Dec. 31, 2013**

(65) **Prior Publication Data**

US 2014/0196584 A1 Jul. 17, 2014

Related U.S. Application Data

(60) Provisional application No. 61/848,816, filed on Jan. 14, 2013.

(51) **Int. Cl.**
B26D 3/16 (2006.01)

(52) **U.S. Cl.**
CPC ***B26D 3/169*** (2013.01); *Y10T 83/04* (2015.04)

(58) **Field of Classification Search**
CPC B26D 3/169; B23D 21/06; B23D 21/08; B23D 21/10
USPC 30/92, 92.5, 93–108
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

3,025,597 A *	3/1962	Huglin	B23D 21/08	30/102
4,026,018 A *	5/1977	Byberg	H02G 1/005	30/254
RE31,674 E *	9/1984	Wozniak	B23D 17/08	83/605
4,558,515 A *	12/1985	LaBounty	E02F 3/965	144/34.5
4,847,997 A *	7/1989	Petty	B26D 3/169	30/102
4,858,316 A *	8/1989	Dubey	B23D 21/08	30/102
5,060,378 A *	10/1991	LaBounty	E01C 23/122	30/134
5,206,996 A *	5/1993	McDaniel	B26D 3/169	30/101

(Continued)

OTHER PUBLICATIONS

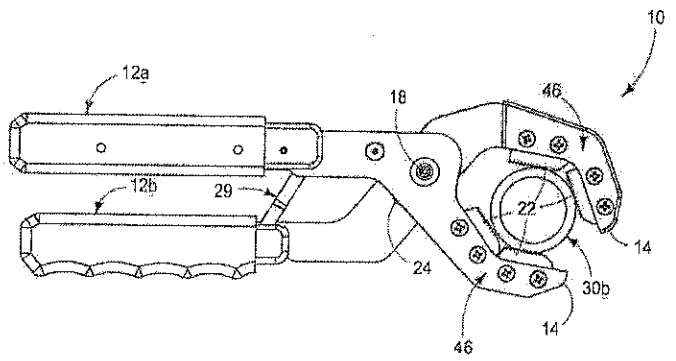
"Tool " Photographs, 1980, 6 pages.

Primary Examiner — Jason Daniel Prone
Assistant Examiner — Richard Crosby, Jr.
(74) *Attorney, Agent, or Firm* — Wells St. John P.S.

(57) **ABSTRACT**

Conduit cutting tools and conduit cutting tool operational methods are described. According to one aspect, a conduit cutting tool includes a pivot pin, a pair of elongated members coupled with the pivot pin, and wherein the elongated members include a jaw and a handle and interior portions of the jaws include cutting blades, wherein the jaws are spaced apart from one another in an open configuration to receive a conduit and one of the elongated members is configured to move with respect to an other of the elongated members as a result of an input force to the handles, and wherein the movement of the one elongated member rotates the jaw of the one elongated member towards the jaw of the other elongated member and moves the jaw of the one elongated member in a substantially linear direction towards the jaw of the other elongated member.

6 Claims, 4 Drawing Sheets



(56) **References Cited**

U.S. PATENT DOCUMENTS

5,581,886	A *	12/1996	Sesser	B23D 21/08 30/101
5,718,051	A *	2/1998	Huang	B23D 21/10 30/250
5,862,593	A *	1/1999	Huang	B26D 3/169 30/182
6,739,055	B2 *	5/2004	Lee	B23D 21/08 30/101
7,503,243	B2 *	3/2009	Putsch	B25B 7/10 81/409.5
7,743,509	B2 *	6/2010	Macsay	B26D 3/169 30/192
7,886,446	B2 *	2/2011	Yu Chen	B26B 13/26 30/175
8,266,991	B2 *	9/2012	Thorson	B23D 21/04 30/101
8,578,614	B2 *	11/2013	Hernandez	B26D 3/169 30/184
9,089,958	B2 *	7/2015	Cleland	B23D 21/02
2002/0170182	A1 *	11/2002	Nordlin	B23D 29/023 30/251
2010/0146795	A1 *	6/2010	Houle	B26B 13/08 30/134
2011/0258860	A1 *	10/2011	Chervenak	B26B 17/02 30/266
2012/0102752	A1 *	5/2012	Steele	B26D 3/169 30/92
2013/0118015	A1 *	5/2013	Smith	B26D 3/169 30/92
2015/0340849	A1 *	11/2015	Kochi	B23D 21/06 30/251

* cited by examiner

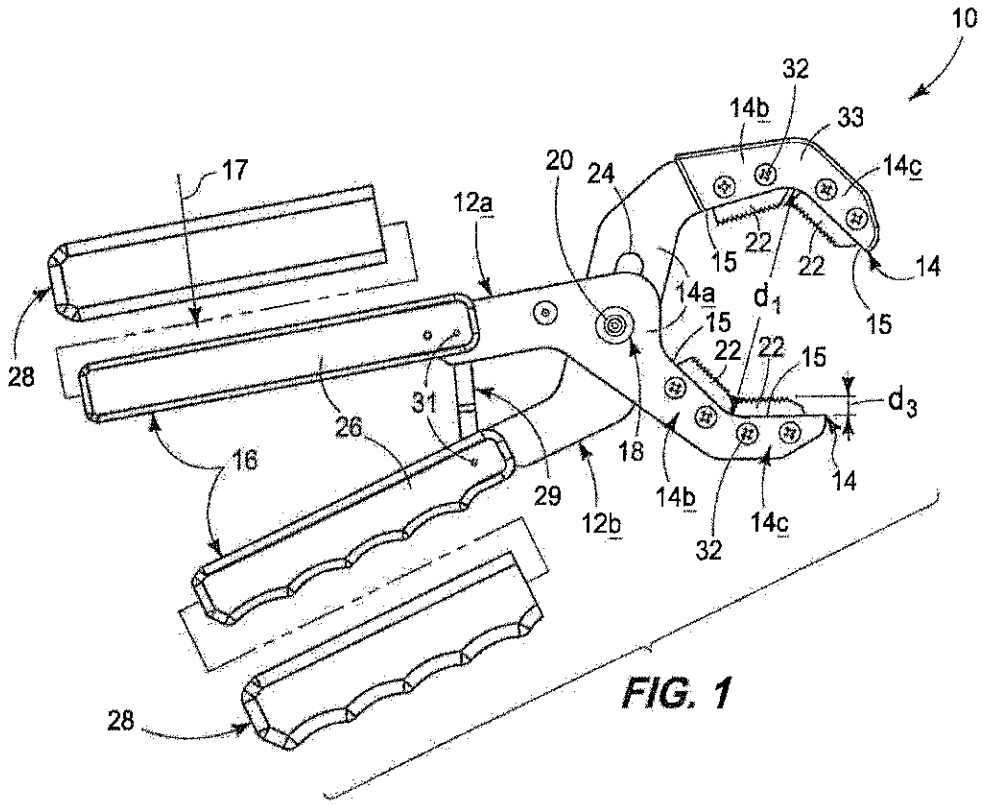

10
32
14b
33
14c
17
20
24
12a
15
22
22
14
14a
d_1
15
15
22
22
15
d_3
28
31
26
16
18
29
12b
14b
14
14c
32
28

FIG. 1

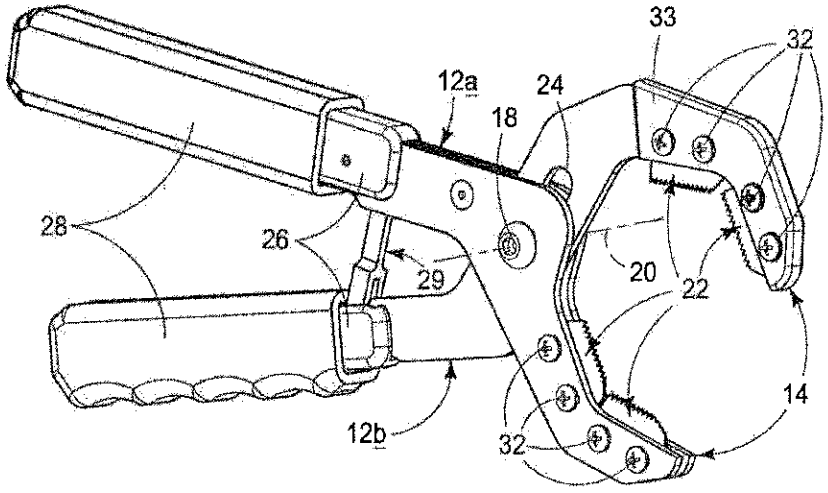

33
32
12a
24
18
28
26
29
20
22
14
12b
32

FIG. 2

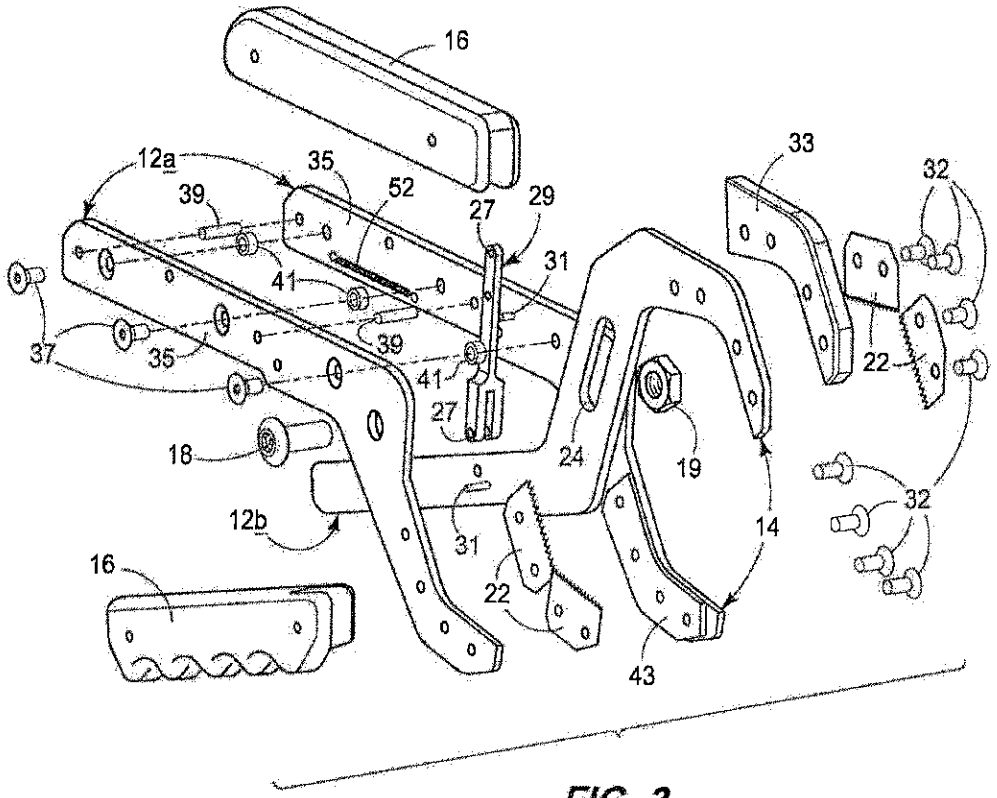

16
12a
35
39
52
27
29
33
32
31
41
37
35
39
22
41
27
18
24
19
12b
31
14
32
16
22
43

FIG. 3

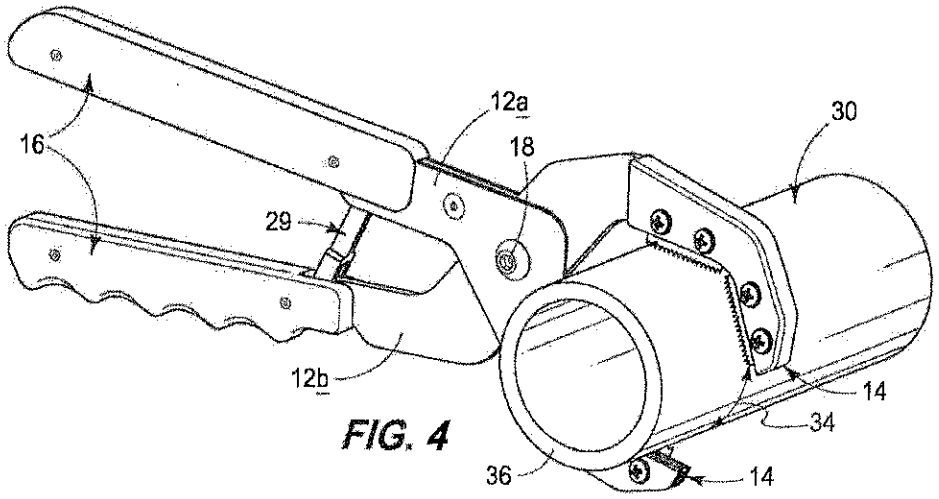

12a
30
16
18
29
12b
14
34
36
14

FIG. 4

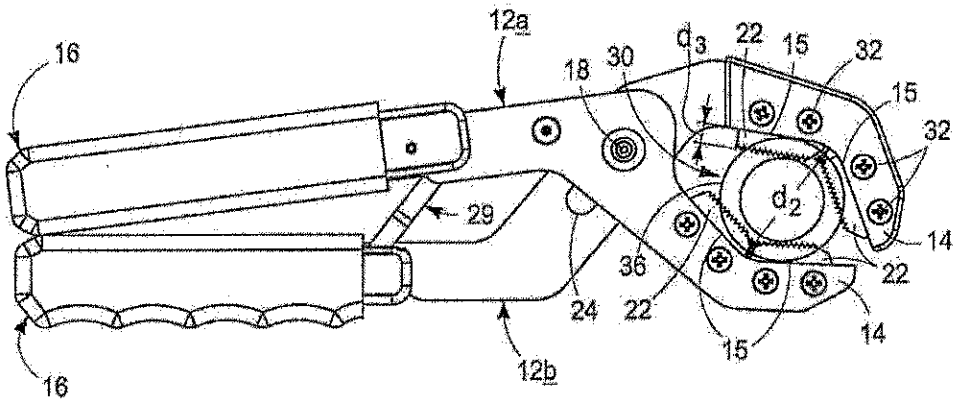

12a
16
18
30
d_3
22
15
32
15
32
d_2
14
22
29
36
24
22
15
14
12b
16

FIG. 5

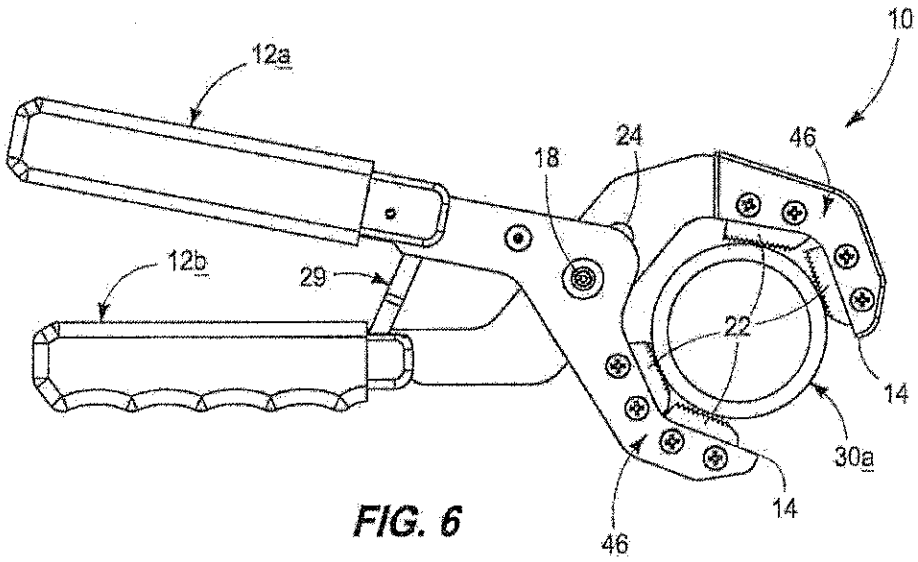

10
12a
24
46
18
12b
29
22
14
30a
14
46

FIG. 6

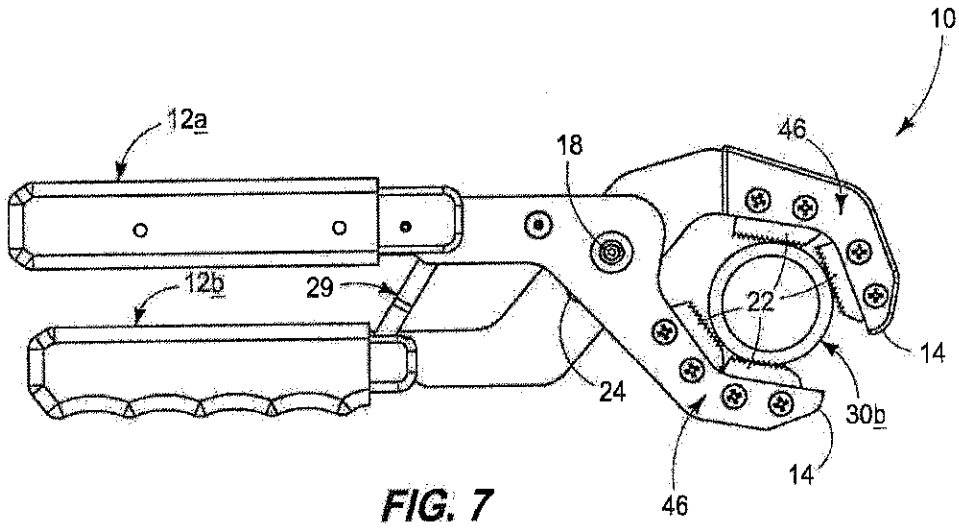


FIG. 7

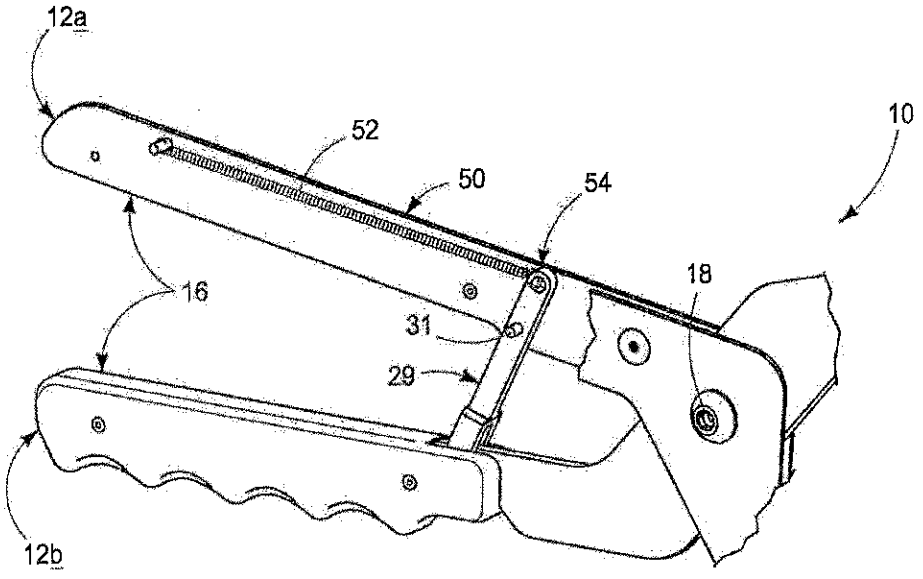


FIG. 8

CONDUIT CUTTING TOOLS AND CONDUIT CUTTING TOOL OPERATIONAL METHODS

RELATED PATENT DATA

This application claims priority to U.S. Provisional Patent Application Ser. No. 61/848,816, filed Jan. 14, 2013, entitled "PVC Cylindrical Material Cutting Device", the disclosure of which is incorporated herein by reference.

TECHNICAL FIELD

This disclosure relates to conduit cutting tools and conduit cutting tool operational methods.

BACKGROUND OF THE DISCLOSURE

Insulated electrical wires may be carried within conduits which may be installed in building structures or buried in different example applications. Currently, there are risks to cutting the conduits (often PVC) to length while insulated wires are present in the interior of the conduit. For example, the interior wires may be damaged during the cutting process necessitating repairs as well as placing the operator cutting the conduit at risk of potential electrical shock.

At least some embodiments of the disclosure are directed towards conduit cutting tools and methods of operation of the tools. Additional aspects of the disclosure are described below.

BRIEF DESCRIPTION OF THE DRAWINGS

Example embodiments of the disclosure are described below with reference to the following accompanying drawings.

FIG. **1** is an illustrative representation of a conduit cutting tool according to one embodiment in an open configuration.

FIG. **2** is a perspective view of a conduit cutting tool according to one embodiment in an open configuration.

FIG. **3** is an exploded view of a conduit cutting tool according to one embodiment.

FIG. **4** is a perspective view of a conduit cutting tool according to one embodiment during use.

FIG. **5** is an illustrative representation of a conduit cutting tool according to one embodiment cutting through a conduit.

FIGS. **6** and **7** are illustrative representations of a conduit cutting tool according to one embodiment engaging conduits having different diameters.

FIG. **8** is a perspective view of a bias system of a conduit cutting tool according to one embodiment.

DETAILED DESCRIPTION OF THE DISCLOSURE

This disclosure is submitted in furtherance of the constitutional purposes of the U.S. Patent Laws "to promote the progress of science and useful arts" (Article 1, Section 8).

At least some aspects of the present disclosure are directed towards apparatus and methods of use to cut circular conduits, such as PVC pipe, to desired length. The conduits may include sensitive contents in some applications (e.g., electrical wires) and some embodiments of the disclosure are directed towards apparatus and methods of facilitating the cutting of these conduits while avoiding damage to the contents of the conduits during the cutting.

Referring to FIGS. **1** and **2**, a conduit cutting tool **10** is shown according to one example embodiment of the disclosure. The depicted embodiment of the conduit cutting tool **10** is configured to be utilized by an individual to cut conduits of different gauges and diameters as discussed further below.

The illustrated conduit cutting tool **10** includes a plurality of elongated members **12***a*, **12***b*. Individual ones of the elongated members **12***a*, **12***b* include a jaw **14** at a first end and a handle **16** at a second end which is opposite to the first end. Elongated members **12***a*, **12***b* may be a suitable material, such as steel, to withstand forces generated during cutting operations.

The elongated members **12***a*, **12***b* are coupled with another in parallel planes via a pivot pin **18**. The pivot pin **18** permits rotation of the elongated members **12***a*, **12***b* with respect to one another during operation. Pivot pin **18** defines a pivot axis **20** which is substantially perpendicular to the planes of the elongated members **12***a*, **12***b* in one embodiment.

As shown in the embodiment of FIG. **1**, interior portions of jaws **14** include a plurality of cutting blades **22** which are configured to cut through walls of a conduit to be cut. Each jaw **14** includes a plurality of substantially linear segments **14***a*, **14***b*, **14***c* which arrange the cutting blades **22** in an angular relationship with one another to define a generally circular cutting configuration during use. The outermost segments **14***c* of jaws **14** are tapered in the illustrated embodiment to enable use of the tool **10** in low clearance areas.

In the illustrated embodiment, grips **26** are installed over the surfaces of the handles **16**. Grips **26** are ergonomic and may be constructed of an electrically-insulating material, such as a suitable plastic or rubber, and capable of protecting the user from moderate electrical currents. In addition, a plurality of grip covers **28** are provided about grips **26** and which may be constructed of a foam, rubber or other suitable electrically-insulating material in example embodiments. Grip covers **28** provide cushion to the users' hands during use as well as additional electrical insulation.

The conduit cutting tool **10** is illustrated in an open configuration in FIG. **1**. Tool **10** is able to receive conduits to be cut between jaws **14** when tool **10** is in the open configuration. In the illustrated example embodiment, the jaws **14** are spaced from one another by an increased distance d1 when tool **10** is the open configuration compared with a distance d2 when the tool **10** is in the closed configuration described further below and as shown in FIG. **5** in one example.

A user may apply an input force **17** during use which urges the handles **16** towards one another and causes at least one of the elongated members **12***a*, **12***b* to move with respect to the other elongated member **12***a*, **12***b* which changes the configuration of the tool **10** from the open to the closed configurations. In one example, the handle **16** of elongated member **12***b* may be fixed and input force **17** may be applied by a user to the handle **16** of elongated member **12***a* which moves the handle **16** of elongated member **12***a* towards the handle **16** of elongated member **12***b*.

In one embodiment, elongated member **12***b* includes an elongated slot **24** which receives pivot pin **18** and pivot pin **18** moves within slot **24** during movement of the elongated member **12***a* and cutting operations of the conduit cutting tool **10**. Slot **24** defines a path of movement of pivot pin **18** and elongated member **12***a* during changes of the conduit cutting tool **10** between the open and closed configurations. In addition, slot **24** defines the spacing of jaws **14** from another and orientation of jaws **14** relative to one another during use in the depicted example embodiment.

In FIG. 1, the pivot pin **18** is shown adjacent to a first end of slot **24** corresponding to the open configuration of tool **10**, while in FIG. **5**, the pivot pin **18** is shown adjacent to a second end of slot which opposite to the first end and corresponds to the closed configuration of tool **10**. In the illustrated example embodiment, slot **24** is arranged to provide substantially linear movement of the jaws **14** relative to one another between the open and closed configurations. In addition, jaw **14** of elongated member **12***a* is configured to rotate about pivot pin **18** and relative to jaw **14** of elongated member **12***b* during changes of the conduit cutting tool **10** between the open and closed configurations.

Conduit cutting tool **10** includes a compression slide linkage **29** which is coupled with each of handles **16**. In one embodiment, plural holes **27** of linkage **29** are coupled with individual ones of the handles **16** at respective pivot points **31** which enables linkage **29** to rotate relative to the pivot points **31** during movement of the elongated members **12***a*, **12***b* relative to one another. In one embodiment, the linkage **29** rotates in a counter-clockwise direction about the pivot pin **31** of elongated member **12***a* and the linkage **29** rotates in a clockwise direction about the pivot pin **31** of elongated member **12***b* as a result of input force **17**. The compression slide linkage **29** generates an intermediate pivot link force from the pivot pin **31** of elongated member **12***b* towards the pivot pin **31** of elongated member **12***a* which forces the pivot pin **18** to slide within slot **24** when the handles **16** are moved towards one another by the user. The application of force **17** results in a force by the elongated member **12***a* on the slot **24** of the elongated member **12***b* at the pivot pin **18** which is in a direction towards the handle **16** of the elongated member **12***a* and perpendicular to the slot **24**.

Leverage of the jaws **14** increases with respect to the conduit being cut as the angle of the slide linkage **29** decreases relative to elongated member **12***b* (e.g., jaws **14** impart a force of about 1:1 to the conduit being cut when cutting a conduit having a 2" diameter in the illustrated example embodiment). In the described embodiment, the slide linkage **29** enables the range of motion of the user's hand to cut different conduits having a relatively wide range of diameters. The conduit cutting tool **10** is configured to cut 1¼"-2" diameter PVC schedule **80** conduits in the example described embodiments. Other configurations of tool **10** having different sizes may be utilized to conduits of other diameters in other embodiments.

Referring to FIG. 2, the cutting blades **22** are attached to jaws **14** using plural retaining devices **32**, such as screws, in one embodiment. Accordingly, cutting blades **22** are removable in the illustrated embodiment and cutting blades **22** of different dimensions may be supplied with tool **10** for use to cut conduits of different gauges. For example, a set of cutting blades **22** having a uniform cutting depth d3 (see FIG. 1) corresponding to a thickness of a wall of the conduit to be cut is selected and attached to the jaws **14** using the retention devices **32**. In one embodiment, cutting blades **22** having a cutting depth which is equal to the thickness of the wall of the conduit to be cut are utilized.

Elongated member **12***b* includes a protective plate **33** which covers portions of the front, back and top surfaces of jaw **14** as shown in the illustrated embodiment. Protective plate **33** may be a suitable electrically insulative material, such as plastic, in some embodiments. Cutting blades **32** may be received within the protective plate **33** and retained between an interior surface of the protective plate **33** and the jaw **14** of elongated member **12***b* by the retaining devices **32** and which provides the cutting blades **22** in a configuration to extend an appropriate distance from interior surfaces **15** of jaws **14**. In some embodiments, jaws **14** may include slots which allow blades **22** to be adjusted inward and outward relative to jaw surfaces **15** to adjust the distance d3 which the cutting blades **22** extend past surfaces **15** of jaws **14**.

Referring to FIG. 3, additional details of one embodiment of conduit cutting tool **10** are shown according to one embodiment. Elongated member **12***a* includes a plurality of parallel members **35** which may be attached in a parallel relationship to one another (and with respect to elongated member **12***b*) using a plurality of rivets **37** and pins **39**. Rivets **37** may pass through a plurality of spacers **41** which space parallel members **35** from one another about elongated member **12***b*. Pivot pin **18** may also be coupled with a nut **19** to retain pin **18** within slot **24** and to couple elongated members **12***a*, **12***b* with one another. An insert **43** is provided intermediate parallel members **35** adjacent to jaw **14** to receive retaining devices **32** and provide the cutting blades **22** attached to elongated member **12***a* in proper lateral and opposing alignment with the cutting blades **22** of elongated member **12***b*.

Referring to FIG. 4, example operations of the conduit cutting tool **10** are described according to one embodiment. Initially, the tool **10** is provided in the open configuration and a conduit **30** to be cut is received within jaws **14**. The application of an input force to handles **16** forces handles **16** towards one another and causes the cutting blades **22** to engage wall **32** of conduit **30**. The tool **10** may be rotated about the circumference of the conduit **30** to scribe **34** the conduit **30** at an appropriate location for cutting. Thereafter, additional input force may be applied to squeeze the handles **16** together further while the tool **10** is rotated back and forth about the circumference of the conduit **30** which causes the cutting blades **22** to cut into conduit **30** a pre-determined depth corresponding to the thickness of wall **32** of the conduit **30** and which provides the tool **10** in the closed configuration.

The upper surfaces of elongated members **12***a*, **12***b* are spaced from one another at an angle of approximately 15.5 degrees in the open configuration and approximately 7.3 degrees in the closed configuration in one embodiment. In addition, elongated member **12***a* extends 7.94" from pivot pin **18** to the end of grip cover **26** and elongated member **12***b* extends 7.307" from pivot pin **18** to the end of grip cover **26** in one embodiment. Jaw **14** of elongated member **12***a* extends outwardly 3.060" from the pivot pin **18**, jaw **14** of elongated member **12***b* extends outwardly 3.55" from the pivot pin **18**, elongated member **12***b* is 11.5" long from the end of jaw **14** to the end of handle **26**, and segments **14***c* of jaws **14** have a thickness of 0.625" in one embodiment. Jaws **14** are spaced from one another when tool **10** is in the open configuration to receive conduits **30** having a diameter of 2.528 inches or less in one embodiment.

In one embodiment described above, the cutting blades **22** are selected which protrude from the interior surfaces **15** of the jaws **14** by a distance d3 which is the same as the thickness of the wall **32** of the conduit **30** to be cut. During the cutting of the conduit **30**, interior surfaces **15** of the jaws **14** eventually contact the outer surface of wall **32** as shown in FIG. **5** and prevent the cutting blades **22** from protruding past the wall **32** into the internal portion of the conduit **30** and avoiding damage to internal contents of the conduit **30**, such as wires (not shown). Cutting blades **22** which protrude different distances d3 from interior surfaces **15** of jaws **14** may be installed and used to cut conduits **30** of other gauges, and worn cutting blades **22** may be replaced in example

embodiments. In the example of FIG. **5**, the cutting blades **22** encircle a majority of the circumference of the conduit **30** being cut.

In some embodiments, the cutting blades **22** are knife-edges capable of bi-directional use to cut through wall **32** of conduit **30** while the cutting tool **10** is rotated back and forth about the circumference of conduit **30**. In one more specific embodiment, the cutting blades **22** are knife-edge V-tooth blades with 14 teeth per inch and with individual teeth extending outwardly 0.75" and being approximately 0.020" thick. In addition, the cutting blades **22** may comprise a durable material, such as stainless steel, which is suitable for cutting numerous conduits **30**.

Referring to FIGS. **6-7**, conduit cutting tool **10** may be utilized to cut conduits **30***a*, **30***b* of different diameters. For example, conduit **30***a* has a diameter of 2.375" and conduit **30***b* has a diameter of 1.66". The combination of elements including the pivot pin **18**, slot **24**, linkage **29** and spring **52** (shown in FIG. **8**) may be referred to as an adjustment system which operates to control the position of the jaws **14** relative to one another and to accommodate different diameters of conduits to be cut.

The cutting blades **22** of the jaws **14** form a plurality of vertices **46** which receive the conduits **30***a*, **30***b* during rotation of the tool **10** about the conduits **30***a*, **30***b* to cut the conduits **30***a*, **30***b*. The illustrated example arrangement of cutting blades **22** with vertices **43** enables contact of the blades **22** with conduits **30***a*, **30***b* of different diameters. The pivot pin **18** is located at different positions within slot **24** during initial engagement of cutting blades **22** with the conduits **30***a*, **30***b* resulting from the jaws **14** being spaced apart from one another by different linear distances corresponding to the different diameters of the conduits **30***a*, **30***b*.

Referring to FIG. **8**, conduit cutting tool **10** includes a bias system **50** which is configured to bias the handles **16** apart from one another to provide the conduit cutting tool **10** in the open configuration where the handles **16** are farthest apart from one another in the absence of an input force applied by the user to move handles **16** towards one another. In one embodiment, bias system **50** includes a compression spring **52** which is coupled with an end **54** of linkage **29** and elongated member **12***a*. The spring **52** provides a bias force which maintains tool **10** in the open configuration where the handles **16** are spaced apart from one another.

The application of an input force by a user to force handles **16** closer together operates to stretch spring **50** and increases the spring tension. The tension of spring **50** returns the conduit cutting tool **10** to the open configuration after removal of the input force to the handles **16** by the user.

The provision of bias system **50** facilitates use of the tool **10** with one hand by an operator as the handles **16** are maintained apart from one another in the open configuration which allows the user to position the tool **10** at an appropriate location about the conduit **30** using a single hand. Thereafter, the force applied to the handles **16** by the hand of the operator may be increased as the tool **10** is rotated back and forth about the conduit **30** to cut the conduit **30**.

At least some aspects of the disclosure provide conduit cutting tools and methods of operation which provide reduced risk of electrical shock and damage to wires (or other contents) which are inside of a conduit during cutting of the conduit compared with use of other conventional cutting tools. Some of the example described embodiments provide conduit cutting tools which may cut conduits of different gauges and diameters. In addition, some embodiments of the disclosure provide tools which include a bias system to bias the tools in an open configuration as described above.

CONCLUSION

In some embodiments, a conduit cutting tool comprises a pivot pin defining a pivot axis, a pair of elongated members coupled with one another by the pivot pin, and wherein the elongated members individually comprise a jaw at a first end and a handle at a second end and interior portions of the jaws comprise cutting blades which are configured to cut the conduit, wherein the jaws are spaced apart from one another by a first distance when the conduit cutting tool is in an open configuration to receive a conduit to be cut between the jaws and one of the elongated members is configured to move with respect to an other of the elongated members as a result of an application of an input force to the handles to provide the tool in a closed configuration wherein the jaws are spaced apart from one another by a second distance less than the first distance to cut the conduit, and wherein the movement of the one elongated member rotates the jaw of the one elongated member towards the jaw of the other elongated member and moves the jaw of the one elongated member in a substantially linear direction towards the jaw of the other elongated member.

In some embodiments, a conduit cutting tool comprises a pivot pin defining a pivot axis, a pair of elongated members coupled with one another by the pivot pin, and wherein the elongated members individually comprise a jaw at a first end and a handle at a second end and interior portions of the jaws include cutting blades which are configured to cut the conduit, wherein a first of the elongated members is configured to rotate about the pivot axis as a result of an application of an input force to the handles, wherein a second of the elongated members comprises a slot configured to receive the pivot pin, a linkage coupled with the handles of the elongated members and configured to cause movement of the pivot pin within the slot as a result of the application of the input force to the handles, and wherein the application of the input force to the handles changes the conduit cutting tool from an open configuration wherein a conduit to be cut is received between the jaws to a closed configuration to cut the conduit.

In some embodiments, a conduit cutting tool operational method comprises providing a plurality of jaws of a conduit cutting tool about a conduit to be cut, the interior surfaces of the jaws comprising cutting blades configured to cut the conduit, applying a force to a plurality of handles coupled with the jaws to move the handles towards one another, as a result of the applying, moving one of the jaws in a substantially linear direction towards an other of the jaws and rotating the one jaw towards the other jaw, and during the applying, moving the conduit cutting tool back and forth around a circumference of the conduit to cut the conduit using the cutting blades.

In compliance with the statute, the invention has been described in language more or less specific as to structural and methodical features. It is to be understood, however, that the invention is not limited to the specific features shown and described, since the means herein disclosed comprise preferred forms of putting the invention into effect. The invention is, therefore, claimed in any of its forms or modifications within the proper scope of the appended aspects appropriately interpreted in accordance with the doctrine of equivalents.

Further, aspects herein have been presented for guidance in construction and/or operation of illustrative embodiments of the disclosure. Applicant(s) hereof consider these described illustrative embodiments to also include, disclose and describe further inventive aspects in addition to those explicitly disclosed. For example, the additional inventive aspects may include less, more and/or alternative features than those described in the illustrative embodiments. In more specific examples, Applicants consider the disclosure to include, disclose and describe methods which include less, more and/or alternative steps than those methods explicitly disclosed as well as apparatus which includes less, more and/or alternative structure than the explicitly disclosed structure.

What is claimed is:

1. A conduit cutting tool comprising:

a pivot pin defining a pivot axis;

a pair of elongated members coupled with one another by the pivot pin, and wherein the elongated members individually comprise a jaw at a first end and a handle at a second end and interior portions of the jaws comprise cutting blades which are configured to cut a conduit;

wherein the jaws are spaced apart from one another by a first distance when the conduit cutting tool is in an open configuration to receive the conduit to be cut between the jaws and one of the elongated members is configured to move with respect to an other of the elongated members as a result of an application of an input force to at least one of the handles to provide the tool in a closed configuration wherein the jaws are spaced apart from one another by a second distance less than the first distance to cut the conduit;

wherein the elongated members are configured to allow the jaw of the one elongated member to rotate towards the jaw of the other elongated member and to move in a substantially linear direction towards the jaw of the other elongated member during the movement of the one elongated member with respect to the other elongated member;

wherein the other elongated member comprises a slot and the pivot pin moves within the slot during the movement of the one elongated member with respect to the other elongated member;

a linkage coupled with the handles of the elongated members and which is configured to cause the movement of the pivot pin within the slot during the movement of the one elongated member with respect to the other elongated member;

wherein the linkage is coupled with and configured to rotate about another pivot pin which is coupled with the one elongated member during the movement of the one elongated member with respect to the other elongated member;

a spring configured to bias the handles apart from one another to provide the conduit cutting tool in the open configuration in the absence of the input force; and

wherein a first end of the linkage is coupled with the other elongated member and the spring is coupled with a second end of the linkage which is opposite to the first end of the linkage.

2. The tool of claim 1 wherein the slot defines the substantially linear movement of the jaw of the one elongated member in a straight line towards the jaw of the other elongated member.

3. The tool of claim 1 wherein the jaw of the one elongated member rotates about the pivot pin during the movement of the one elongated member with respect to the other elongated member.

4. The tool of claim 1 wherein the another pivot pin is between the first and second ends of the linkage.

5. The tool of claim 1 wherein individual ones of the jaws include at least three substantially linear segments.

6. The tool of claim 1 wherein the cutting blades extend a distance outwardly from surfaces of the jaws which corresponds to a gauge of the conduit.

* * * * *