US009922779B2

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

(10) **Patent No.: US 9,922,779 B2**
(45) **Date of Patent: Mar. 20, 2018**

(54) **ELECTRICAL ENCLOSURE, AND SWITCHING ASSEMBLY AND TRANSFER ASSEMBLY THEREFOR**

(71) Applicant: **EATON CORPORATION**, Cleveland, OH (US)

(72) Inventors: **Xuecheng Zhang**, Xi'An (CN); **Matthew Rain Darr**, Edwardsville, IL (US); **Xuan Guo**, Xi'An (CN)

(73) Assignee: **EATON CORPORATION**, Cleveland, OH (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 82 days.

(21) Appl. No.: **15/142,136**

(22) Filed: **Apr. 29, 2016**

(65) **Prior Publication Data**

US 2017/0316892 A1 Nov. 2, 2017

(51) **Int. Cl.**
H01H 3/12 (2006.01)
H01H 9/02 (2006.01)

(52) **U.S. Cl.**
CPC ***H01H 3/12*** (2013.01); ***H01H 9/02*** (2013.01)

(58) **Field of Classification Search**
CPC H01H 3/12; H01H 9/02
USPC 200/318–327, 330
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

5,288,958 A * 2/1994 Grunert H01H 9/22 200/329
5,493,084 A * 2/1996 Whitaker H01H 3/10 200/330
6,194,983 B1 * 2/2001 Bogdon G05G 1/04 200/329
7,348,510 B1 3/2008 Foley et al.
(Continued)

FOREIGN PATENT DOCUMENTS

DE 10 2009 053164 A1 5/2011
EP 2 843 676 A1 3/2015

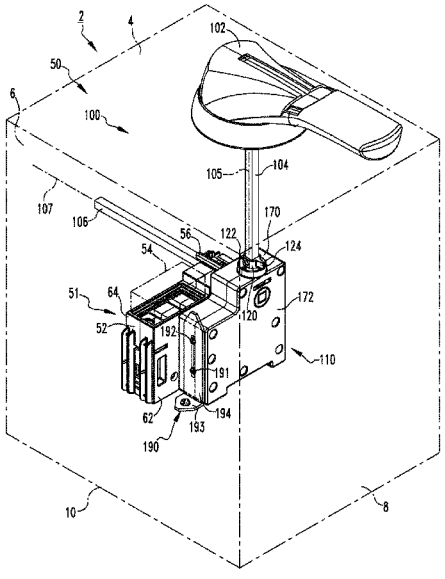
OTHER PUBLICATIONS

Eaton Corporation, Compact Circuit Protector, Bussmann Series, Industry's Smallest Fused Disconnect Offers Superior Circuit Protection, Publication No. 3191, Oct. 2015, 4 pp.
(Continued)

Primary Examiner — Edwin A. Leon
Assistant Examiner — Iman Malakooti
(74) *Attorney, Agent, or Firm* — Eckert Seamans; John Powers; Grant Coffield

(57) **ABSTRACT**

A transfer assembly is for a switching assembly of an electrical enclosure. The switching assembly includes an electrical switching apparatus having an operating handle structured to move from an OFF position to an ON position. The transfer assembly includes a driving handle; a first shaft member coupled to the driving handle; a second shaft member structured to be coupled to the operating handle; and a transmission assembly having a first component and a
(Continued)



second component, the first component being coupled to the first shaft member, the second component being coupled to the second shaft member. The transfer assembly is structured to move from a FIRST position to a SECOND position. When the transfer assembly moves from the FIRST position to the SECOND position, the first component drives the second component, thereby causing the second shaft member to move the operating handle from the OFF position to the ON position.

19 Claims, 7 Drawing Sheets

(56) **References Cited**

U.S. PATENT DOCUMENTS

7,473,116	B2	1/2009	Dudhwala et al.	
7,482,548	B2 *	1/2009	Periot	H01H 9/22 200/330
7,569,770	B2	8/2009	Remmert et al.	
7,688,573	B2	3/2010	Ranta	
8,319,123	B2	11/2012	Faulkner et al.	
9,246,318	B2	1/2016	Hussey et al.	
2002/0038759	A1	4/2002	Hamada et al.	
2009/0057118	A1 *	3/2009	Nguyen	G05G 1/10 200/330
2011/0163837	A1 *	7/2011	Darr	H01H 1/20 337/186
2015/0155111	A1 *	6/2015	Kondrus	H05K 5/0017 200/43.13

OTHER PUBLICATIONS

European Patent Office, "extended European search report", (corresp. to EP 17167168.8), dated Oct. 9, 2017, 7 pp.

* cited by examiner

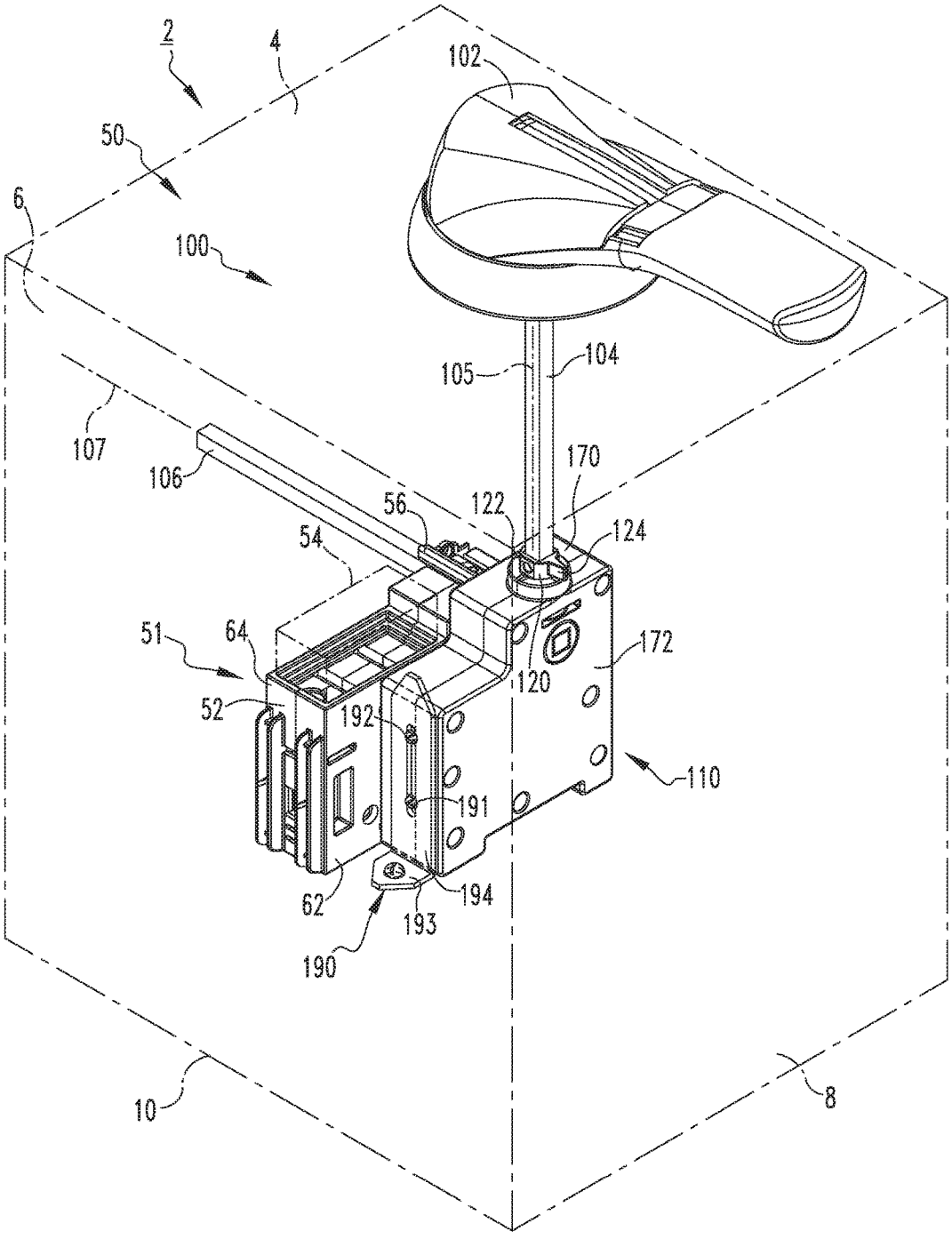

2
4
102
50
6
100
105
104
107
106
170
56
122
54
124
51
64
172
120
52
192
110
191
62
194
193
190
10
8

FIG.1

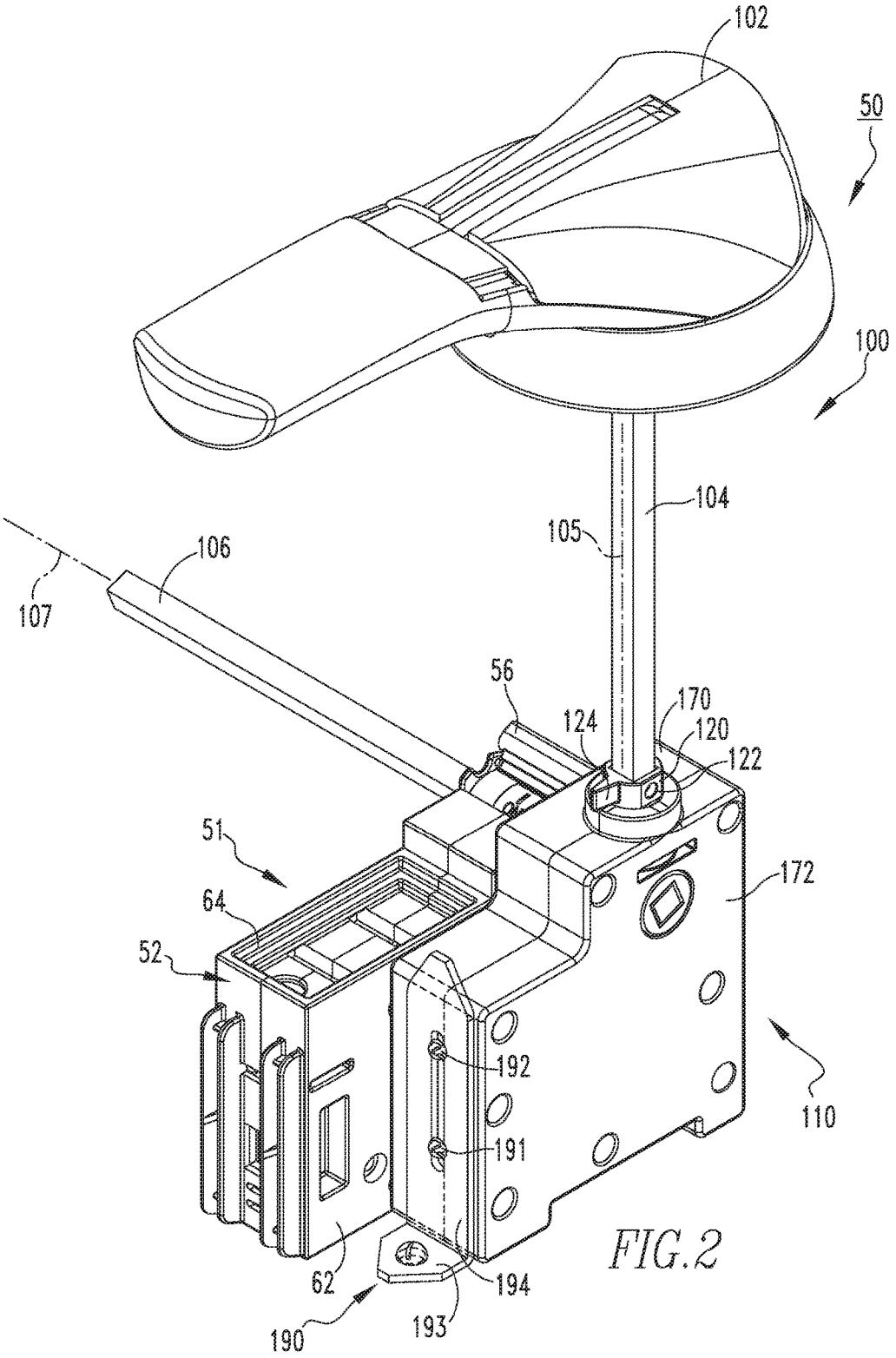

102
50
100
104
105
106
107
56
170
124
120
122
51
172
64
52
192
191
110
62
194
190
193

FIG.2

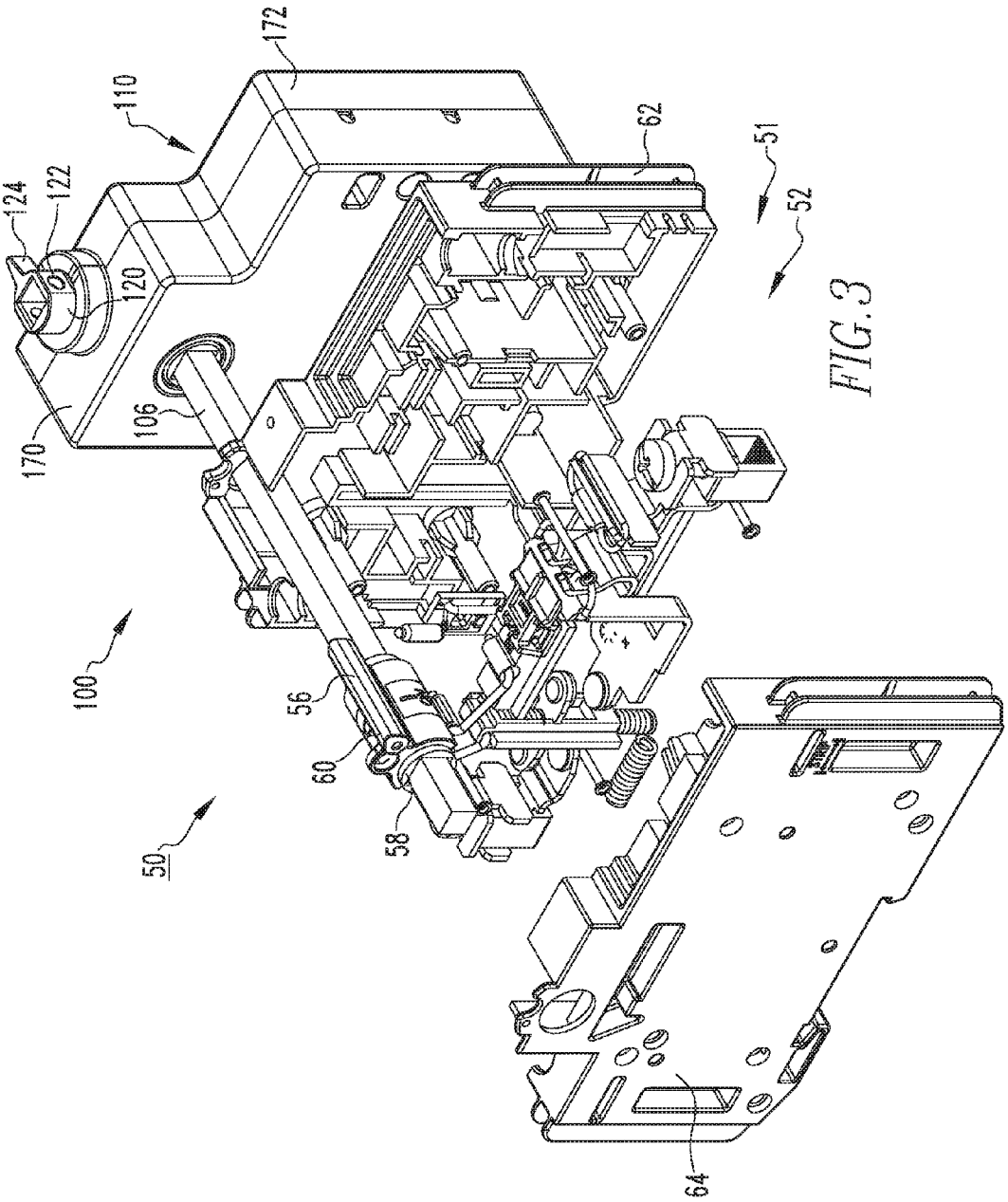


FIG. 3

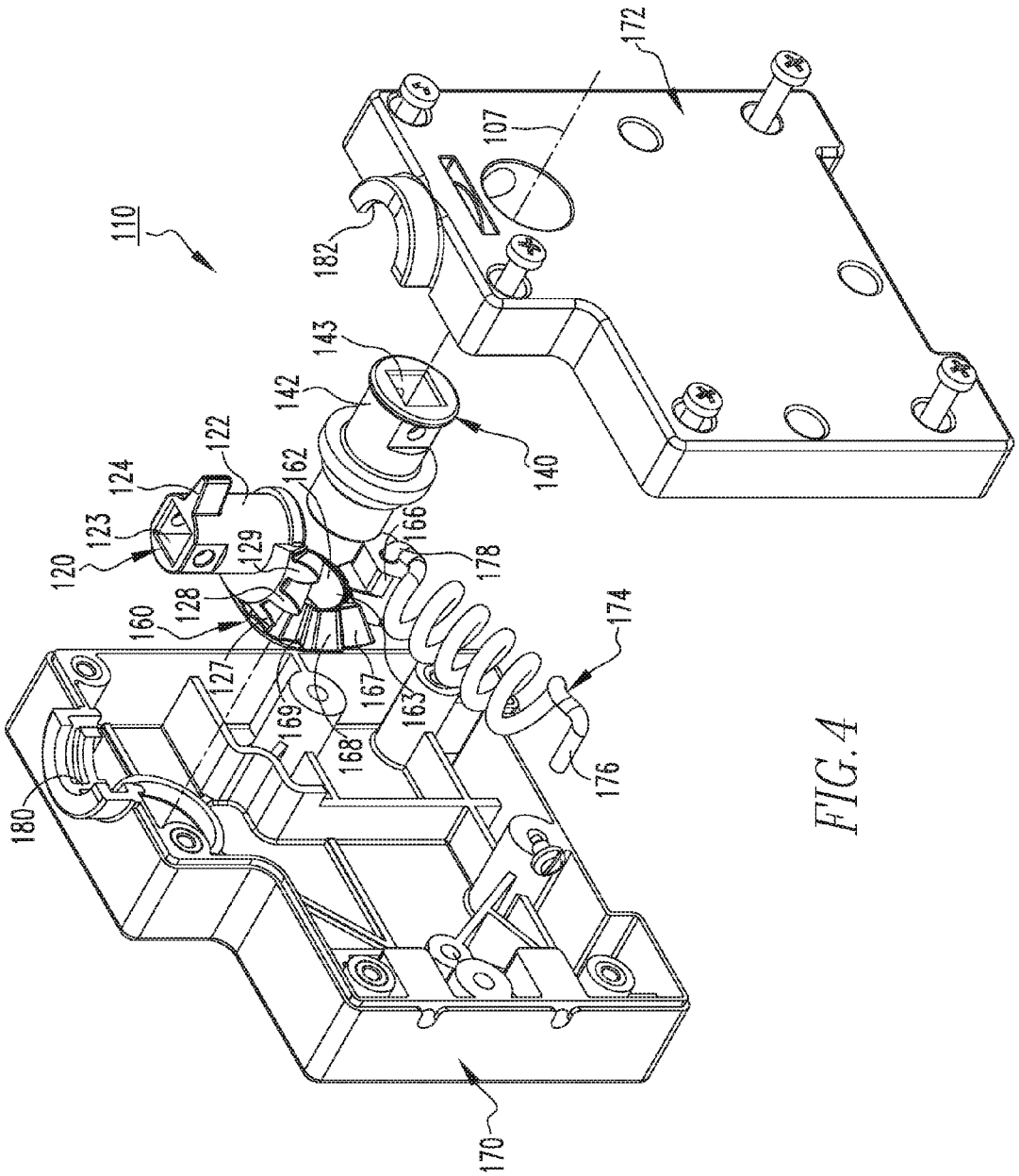

110
172
107
182
143
142
140
122
162
124
123
120
129
166
178
160
128
174
127
167
163
169
168
176
180
170

FIG. 4

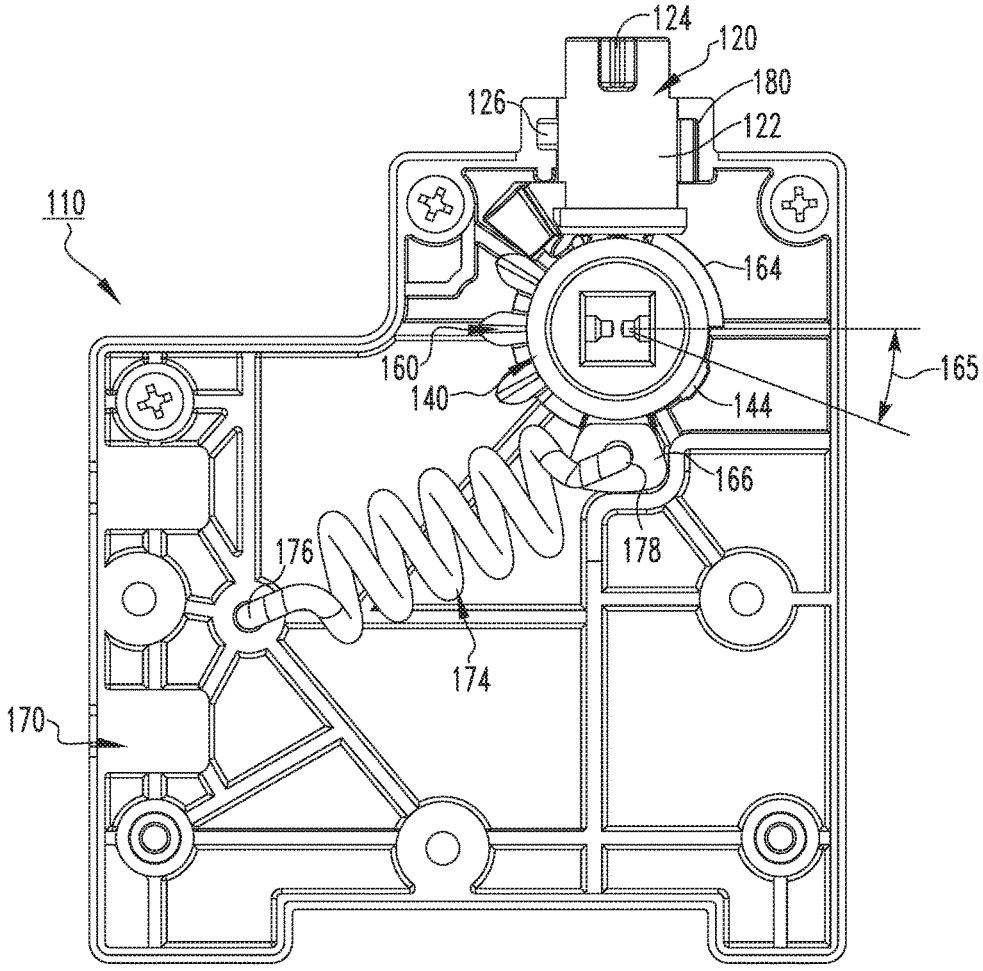

124
120
180
126
122
110
164
160
140
144
165
166
176
178
174
170

FIG. 5A

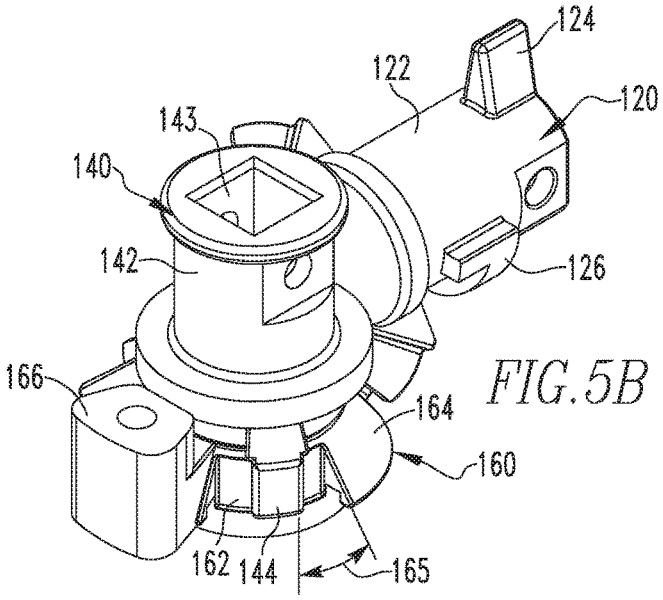

124
122
120
143
140
142
126
166
164
160
162
144
165

FIG. 5B

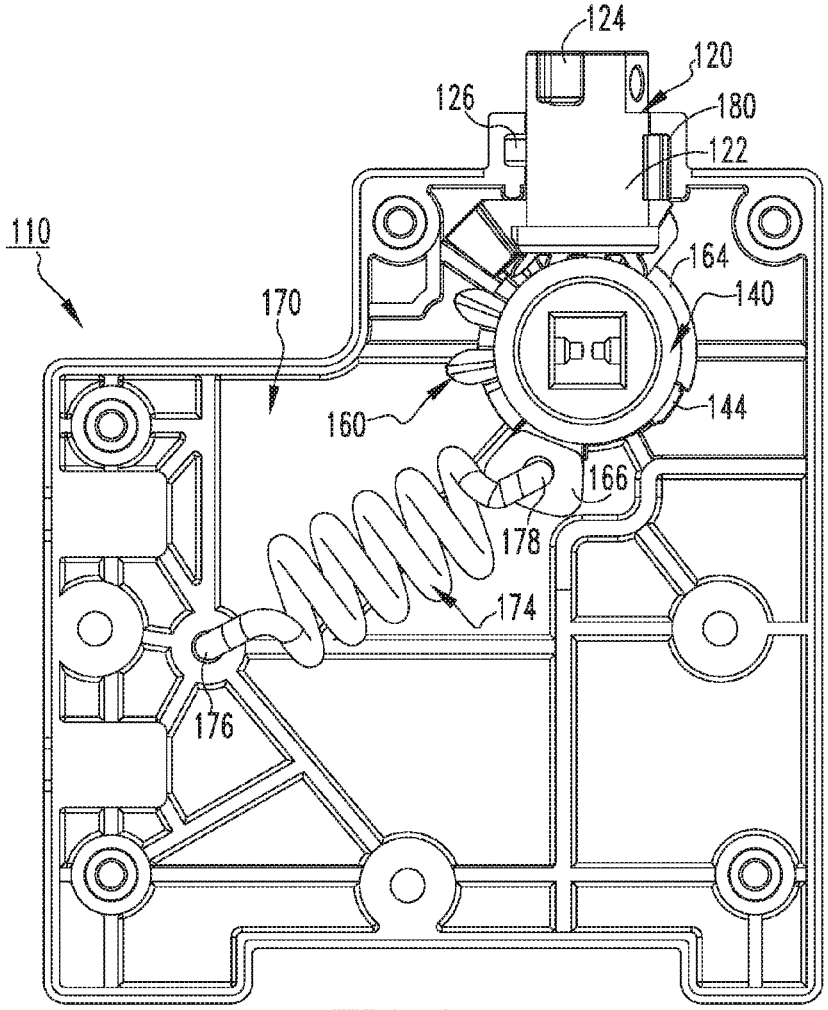

124
120
126
180
122
110
164
170
140
160
144
166
178
174
176

FIG. 6A

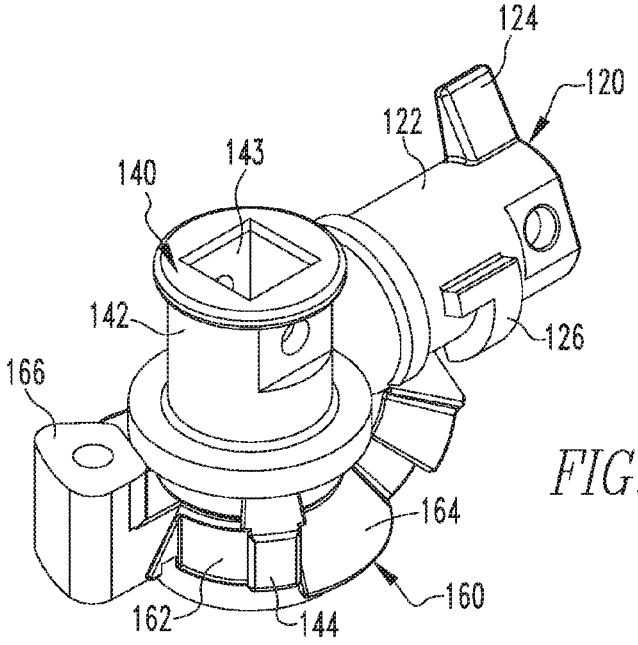

124
120
122
143
140
142
126
166
164
160
162
144

FIG. 6B

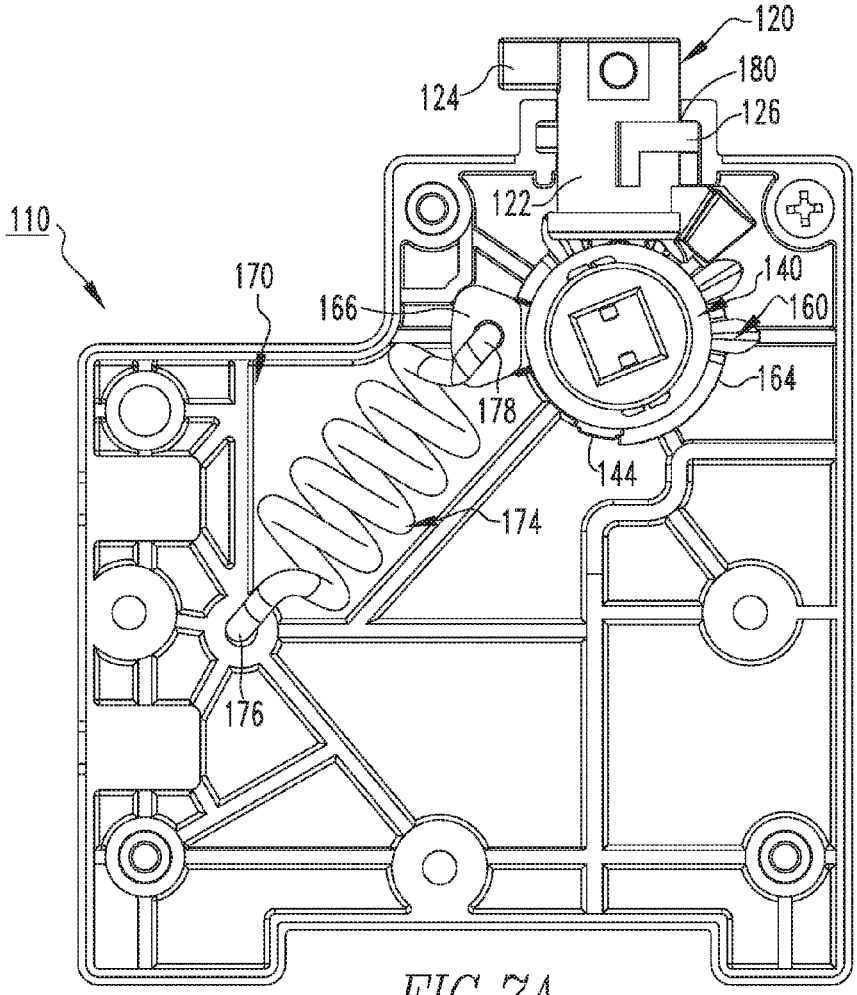

120
180
126
124
122
110
170
166
140
160
164
178
144
174
176

FIG. 7A

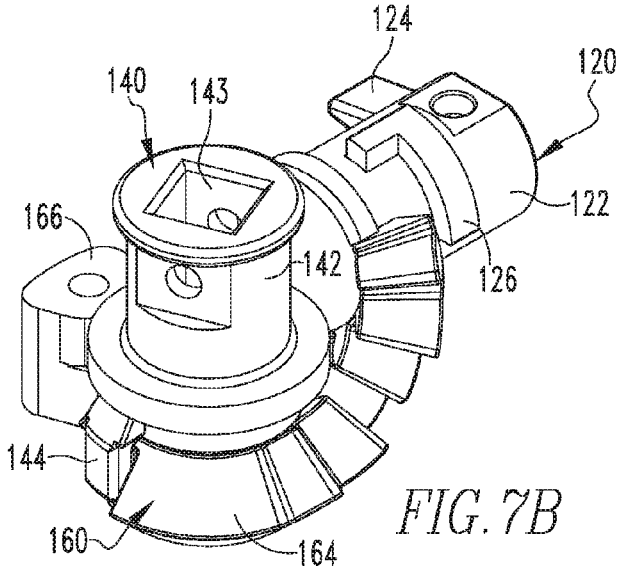

124
120
140
143
122
166
142
126
144
160
164

FIG. 7B

ELECTRICAL ENCLOSURE, AND SWITCHING ASSEMBLY AND TRANSFER ASSEMBLY THEREFOR

BACKGROUND

Field

The disclosed concept relates generally to enclosures and, more specifically, to electrical enclosures. The disclosed concept further relates to switching assemblies for electrical enclosures including, for example, electrical switching apparatus. The disclosed concept also relates to transfer assemblies for switching assemblies.

Background Information

Electrical enclosures can enclose a wide range of electrical equipment, such as, for example and without limitation, electrical switching apparatus. Many known electrical enclosures do not provide a reliable mechanism to operate the electrical switching apparatus located within the electrical enclosure from a position outside of the electrical enclosure. For example, moving the electrical switching apparatus located within the electrical enclosure between ON and OFF positions typically requires a burdensome process of opening the electrical enclosure (e.g., a door member) in order to reach inside and access the electrical switching apparatus.

There is thus room for improvement in electrical enclosures, and in switching assemblies and transfer assemblies therefor.

SUMMARY

These needs and others are met by embodiments of the disclosed concept, which are directed to an electrical enclosure, and switching assembly and transfer assembly therefor.

As one aspect of the disclosed concept, a transfer assembly for a switching assembly of an electrical enclosure is provided. The switching assembly includes an electrical switching apparatus having an operating handle structured to move from an OFF position to an ON position. The transfer assembly comprises a driving handle; a first shaft member coupled to the driving handle; a second shaft member structured to be coupled to the operating handle; and a transmission assembly comprising a first component and a second component, the first component being coupled to the first shaft member, the second component being coupled to the second shaft member. The transfer assembly is structured to move from a FIRST position to a SECOND position. When the transfer assembly moves from the FIRST position to the SECOND position, the first component drives the second component, thereby causing the second shaft member to move the operating handle from the OFF position to the ON position.

As another aspect of the disclosed concept, a switching assembly including an electrical switching apparatus and the aforementioned transfer assembly is provided.

As another aspect of the disclosed concept, an electrical enclosure including a number of enclosure members and the aforementioned switching assembly is provided. The enclosure members are cooperatively structured to form an enclosed region. The electrical switching apparatus is located within the enclosed region and the driving handle is located external with respect to the enclosed region.

BRIEF DESCRIPTION OF THE DRAWINGS

A full understanding of the disclosed concept can be gained from the following description of the preferred embodiments when read in conjunction with the accompanying drawings in which:

FIG. **1** is a simplified front isometric view of an electrical enclosure, and switching assembly and transfer assembly therefor, partially shown in simplified form in phantom line drawing, and shown with the transfer assembly in a FIRST position, in accordance with a non-limiting embodiment of the disclosed concept;

FIG. **2** is a front isometric view of the switching assembly and transfer assembly therefor of FIG. **1**, shown with the transfer assembly in a SECOND position;

FIG. **3** is a partially exploded front isometric view of a portion of the switching assembly and transfer assembly therefor of FIG. **2**, shown with the transfer assembly in the FIRST position;

FIG. **4** is an exploded front isometric view of the transmission assembly for the transfer assembly of FIG. **3**;

FIG. **5**A is a front elevation view of a portion of the transmission assembly of FIG. **4**, shown with the transmission assembly in the FIRST position;

FIG. **5**B is a front isometric view of a number of components of the transmission assembly of FIG. **5**A;

FIG. **6**A is a front elevation view of the portion of the transmission assembly of FIG. **5**A, shown with the transmission assembly in a THIRD position;

FIG. **6**B is a front isometric view of a number of components of the transmission assembly of FIG. **6**A;

FIG. **7**A is a front elevation view of the portion of the transmission assembly of FIG. **6**A, shown with the transmission assembly in the SECOND position; and

FIG. **7**B is a front isometric view of a number of components of the transmission assembly of FIG. **7**A.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

As employed herein, the term "number" shall mean one or an integer greater than one (i.e., a plurality).

As employed herein, the statement that two or more parts are "connected" or "coupled" together shall mean that the parts are joined together either directly or joined through one or more intermediate parts.

As employed herein, the statement that two or more parts or components "engage" one another shall mean that the parts exert a force against one another either directly or through one or more intermediate parts or components.

As employed herein, the term "drives" shall mean that a first component causes a second component to move, either through direct engagement between the first component and the second component, or through indirect engagement wherein the first component and the second component do not directly engage one another, but a number of intermediate components provide a link between the first component and the second component in order to allow the first component to cause the second component to move.

As employed herein, the term "coupling member" refers to any suitable connecting or tightening mechanism expressly including, but not limited to, rivets, screws, bolts, the combination of bolts and nuts (e.g., without limitation, lock nuts), washers and nuts, zip ties, and wire ties.

FIG. **1** shows an electrical enclosure **2** (partially shown in simplified form in phantom line drawing), in accordance with a non-limiting embodiment of the disclosed concept.

The example electrical enclosure **2** includes a number of enclosure members (e.g., without limitation, door **4** and panel members **6**,**8**,**10**, all shown in simplified form) coupled to one another, and a switching assembly **50**. The switching assembly **50** includes an electrical switching apparatus **51** and a transfer assembly **100**. The door **4** and the panel members **6**,**8**,**10** together define an enclosed region to enclose the electrical switching apparatus **51**. As will be discussed in greater detail hereinbelow, the transfer assembly **100** provides a novel mechanism to allow the electrical switching apparatus **51** to move between an ON position and an OFF position without having to separately open the door **4** or otherwise access the interior of the electrical enclosure **2**. That is, operators can operate the transfer assembly **100** to move the electrical switching apparatus **51** between the ON and OFF positions from outside of the electrical enclosure **2**. This saves time, as operators might otherwise be required to open a door (not shown) in order to move a similarly enclosed electrical switching apparatus (not shown) between ON and OFF positions. Additionally, the transfer assembly **100** improves safety in that operators can open a respective electrical circuit before opening the electrical enclosure **2** to access the interior.

The electrical switching apparatus **51** includes a compact circuit protector **52** and a fuse **54** (shown in simplified form in phantom line drawing in FIG. **1**) mechanically coupled and electrically connected to the compact circuit protector **52**. The compact circuit protector **52** has an operating handle **56**, which is depicted in an OFF position in FIG. **1** and an ON position in FIG. **2**. In order to cause the operating handle **56** to move between the ON and OFF positions (i.e., in order to close and open the electrical circuit), and responsive to activation by an operator, the transfer assembly **100** is structured to move between a FIRST position and a SECOND position.

The transfer assembly **100** includes a driving handle **102**, a number of shaft members **104**,**106**, and a transmission assembly **110**. The shaft members **104**,**106** and the transmission assembly **110** transmit rotary motion of the driving handle **102** (i.e., as a result of an operator manually moving the driving handle **102**) into movement of the electrical switching apparatus operating handle **56**. The first shaft member **104** extends through the door **4** and is coupled to the driving handle **102** such that the door **4** is located between the driving handle **102** and the transmission assembly **110**. Referring to the partially exploded view of FIG. **3**, the compact circuit protector **52** includes a number of wall members **62**,**64** structured to be coupled to the operating handle **56**, and the operating handle **56** includes a receiving portion **58** and a distal portion **60** opposite the receiving portion **58**. In one exemplary embodiment, the second shaft member **106** at least partially extends into the receiving portion **58** and through the wall members **62**,**64**. Furthermore, the receiving portion **58** is shaped corresponding to the cross-section of the second shaft member **106** (e.g., without limitation, rectangular-shaped) and is coupled to the second shaft member **106** in order that rotation of the second shaft member **106** corresponds to rotation of the operating handle **56**. Stated differently, rotation of the second shaft member **106** causes the operating handle **56** to rotate.

FIG. **4** shows an exploded view of the transmission assembly **110**. As shown, the transmission assembly **110** is structured to operate as a gear box that transmits rotation of the first shaft member **104** (FIGS. **1** and **2**) into rotation of the second shaft member **106** (FIGS. **1** through **3**). More specifically, the transmission assembly **110** includes a number of gears (e.g., without limitation, bevel gears **120**,**160**), another component **140**, a number of housing members **170**,**172** coupled to one another, and a biasing element (e.g., without limitation, compression spring **174**). It will be appreciated that the second shaft member **106** extends through the housing member **170**.

The first bevel gear **120** has a body **122**, a first protrusion **124** and a second, partially annular-shaped protrusion **126** (shown in FIGS. **5**A through **7**B) each extending outwardly from the body **122**. The body **122** has a rectangular-shaped receiving portion **123**. The first shaft member **104** extends into the receiving portion **123** and is coupled to the body **122**. In this manner, rotation of the first shaft member **104** causes rotation of the first bevel gear **120**. The housing members **170**,**172** each have respective semi-annular shaped grooved regions **180**,**182**. Thus, when the housing members **170**,**172** are assembled and are adjacent one another, the semi-annular shaped grooved regions **180**,**182** together define a smooth annular-shaped grooved region. In operation, when the first shaft member **104** is rotated responsive to rotation of the driving handle **102**, the second protrusion **126** rotates within the grooved regions **180**,**182** (see, for example, FIGS. **5**A, **6**A, and **7**A). This motion advantageously fixes the longitudinal position of the first shaft member **104** with respect to the housing members **170**,**172**. In other words, the first shaft member **104** may rotate with respect to portions of the transmission assembly (i.e., the housing members **170**,**172**), but the second protrusion **126** and the grooved regions **180**,**182** limit the length with which the first shaft member **104** can extend into the transmission assembly **110**.

Additionally, referring again to FIGS. **1** through **3**, the first protrusion **124** is located external with respect to the housing members **170**,**172** and is structured to provide an indication of whether the electrical switching apparatus **51** is in the ON or OFF position. For example and without limitation, as shown in FIG. **1**, when the electrical switching apparatus **51** is in the OFF position, the first protrusion **124** extends from the body **122** away from the electrical switching apparatus **51** (i.e., in a direction perpendicular to the electrical switching apparatus **51**). When the transmission assembly **110** has been moved to the SECOND position, shown in FIG. **2**, the first protrusion **124** extends from the body **122** in a direction parallel with the electrical switching apparatus **51**. As such, the first protrusion **124** provides a beneficial mechanism to indicate which positions of the transfer assembly **100** correspond to the ON and OFF positions of the electrical switching apparatus **51**. This helps with alignment of the transfer assembly **110** during assembly of the electrical enclosure **2**.

Referring again to FIG. **4**, the second bevel gear **160** includes a body **162**, a first protrusion **164** (shown in FIGS. **5**A through **7**B) and a second protrusion **166** each extending outwardly from the body **162**. The body **162** has a number of teeth (three teeth **167**,**168**,**169** are indicated), and the body **122** of the bevel gear **120** has a number of teeth (three teeth **127**,**128**,**129** are indicated). The teeth **127**,**128**,**129**,**167**,**168**,**169** are each located internal with respect to the housing members **170**,**172**. The teeth **127**,**128**,**129** mechanically engage and cooperate with the teeth **167**,**168**,**169**. That is, rotation of the first bevel gear **120** (i.e., responsive to rotation of the first shaft member **104** about a longitudinal axis **105** (FIGS. **1** and **2**) of the first shaft member **104**) is structured to cause the second bevel gear **160** to rotate about a longitudinal axis (see longitudinal axis **107** in FIGS. **1** and **2**, which extends through a central thru hole of the second bevel gear **160**) of the second shaft member **106**. In turn, the rotation of the second bevel gear **160** is structured to cause

the second shaft member **106**, by way of the component **140**, to rotate about the longitudinal axis **107**. It will thus be understood that when the transfer assembly **100** moves from the FIRST position to the SECOND position, the first bevel gear **120** drives the component **140**, thereby causing the second shaft member **106** to move the operating handle **56** between the ON position and the OFF position.

More specifically, the component **140** includes a body **142** and a projection **144** (shown in FIGS. **5**A through **7**B) extending outwardly from the body **142**. The body **142** has a rectangular-shaped receiving portion **143** that receives the second shaft member **106** in order to couple the second shaft member **106** to the body **142** to transmit rotation of the second bevel gear **160** into rotation of the second shaft member **106**. As such, the body **142** extends into and through at least a portion of the body **162**.

As shown in FIGS. **5**A and **5**B, when the bevel gears **120**,**160** and the component **140** are in the FIRST position (i.e., when the transfer assembly **100** is in the FIRST position), the first protrusion **164** of the second bevel gear **160** is spaced from the projection **144** of the component **140**. When the second bevel gear **160** initially moves from the FIRST position (FIGS. **1**, **3**, **4**, **5**A, and **5**B) toward the SECOND position (FIGS. **2**, **7**A, and **7**B) responsive to rotation of the first bevel gear **120**, the first protrusion **164** rotates toward the projection **144**. Continued rotation of the second bevel gear **160** results in the protrusion **164** moving into engagement with the projection **144**. This is depicted in FIG. **6**A, which shows the transfer assembly **110** in a THIRD position between the FIRST position and the SECOND position. When the transfer assembly is moving from the FIRST position toward the THIRD position, the second bevel gear **160** rotates independently with respect to the component **140**, and as such, is not causing the second shaft member **106** to rotate. It will be appreciated that when the transfer assembly **110** moves from the FIRST position to the THIRD position, the first protrusion **164** rotates an angle (see, for example, angle **165** from the perspective of FIG. **5**A) between 10 degrees and 40 degrees with respect to (i.e., rotates around) the longitudinal axis **107** (FIGS. **1**, **2**, and **4**) in order to move into engagement with the projection **144**. When the transfer assembly **100** moves from the THIRD (FIGS. **6**A and **6**B) position toward the SECOND position (FIGS. **7**A and **7**B), the first protrusion **164** drives (i.e., engages and thereby rotates together with) the projection **144**, thereby causing the second shaft member **106**, which is fixed with respect to the component **140**, to rotate.

Accordingly, it will be appreciated that the novel mechanism of the disclosed concept advantageously allows the transfer assembly **100** to be employed with a large number of different electrical switching apparatus (not shown) in addition to the electrical switching apparatus **51**. More specifically, the compact circuit protector **52** has a predetermined range of rotation over which the operating handle **56** rotates. If the transfer assembly **100** is employed with a suitable alternative electrical switching apparatus (not shown), the range of rotation may be different. As such, in order to ensure that the operating handle (not shown) of such an electrical switching apparatus (not shown) reliably moves between ON and OFF positions, the angle **165** is advantageously able to be changed to correspond to the different angle of rotation.

In order to reliably move the transfer assembly **100** between the FIRST position and the SECOND position, and also to maintain the transfer assembly **100** in the FIRST position and the SECOND position, as desired, the transmission assembly **110** preferably further includes the compression spring **174**. Specifically, referring to FIGS. **5**A and **7**A, the compression spring **174** has a first end portion **176** coupled to and fixed with respect to the housing member **170**, and a second, opposing end portion **178** coupled to the second protrusion **166** of the second bevel gear **160**. When the transfer assembly **100** moves between the FIRST position and the SECOND position, the second end portion **178** rotates about the longitudinal **107** (FIGS. **1** and **2**) in order to function as an operating mechanism for the transmission assembly **110**. Specifically, when the transfer assembly **100** is in the FIRST position, the compression spring **174** biases the transfer assembly **100** to the FIRST position. When the transfer assembly **100** moves from the FIRST position to the SECOND position, the compression spring **174** passes its equilibrium position (i.e., the position in which the compression spring does not bias the transfer assembly **110** toward either the FIRST position or the SECOND position). As the compression spring **174** passes its equilibrium position, the compression spring begins to release stored energy and to bias the transfer assembly **100** toward the SECOND position. Thus, when the transfer assembly **100** is in the SECOND position, the compression spring **174** biases the transfer assembly **100** to the SECOND position.

Referring again to FIG. **1**, in order to mount the transfer assembly **100** within the electrical enclosure **2**, the transmission assembly **110** further includes a mounting member **190** and a number of coupling members **191**,**192** that couple the mounting member **190** to the housing members **170**,**172**. In the example shown and described herein, the mounting member **190** has a pair of planar portions **193**,**194** extending from and being perpendicular to one another. The first planar portion **193** is flush with and coupled to the panel member **10**. The second planar portion **194** has an elongated slot and the coupling members **191**,**192** extend through the slot and into at least one of the housing members **170**,**172** in order to couple the housing members **170**,**172** to the mounting member **190** (i.e., and thus the panel member **10**). As a result, the height of the transfer assembly **100** is advantageously able to be adjusted as a result of the slot in the mounting member **190**.

Accordingly, it will be appreciated that the disclosed concept provides for an improved (e.g., without limitation, more efficient and safer) electrical enclosure **2**, and switching assembly **50** and transfer assembly **100** therefor, in which operating personnel can move an electrical switching apparatus **51** between ON and OFF positions from a location external to the electrical enclosure **2**. In other words, the electrical switching apparatus **51**, which is located in an enclosed region defined by a door **4** and a number of panel members **6**,**8**,**10**, can be operated and/or moved between ON and OFF positions from a position external the enclosed region by, for example, simple rotation of a driving handle **102** of the transfer assembly **100**. Thus, among other advantages, the disclosed concept saves operators time, and provides safety and protection, as compared to prior art electrical enclosures.

While specific embodiments of the disclosed concept have been described in detail, it will be appreciated by those skilled in the art that various modifications and alternatives to those details could be developed in light of the overall teachings of the disclosure. Accordingly, the particular arrangements disclosed are meant to be illustrative only and not limiting as to the scope of the disclosed concept which is to be given the full breadth of the claims appended and any and all equivalents thereof.

What is claimed is:

1. A transfer assembly for a switching assembly of an electrical enclosure, said switching assembly comprising an electrical switching apparatus having an operating handle structured to move from an OFF position to an ON position, said transfer assembly comprising:

a driving handle;

a first shaft member coupled to said driving handle;

a second shaft member structured to be coupled to said operating handle; and

a transmission assembly comprising a first component and a second component, said first component being coupled to said first shaft member, said second component being coupled to said second shaft member,

wherein said transfer assembly is structured to move from a FIRST position to a SECOND position, and

wherein, when said transfer assembly moves from the FIRST position to the SECOND position, said first component drives said second component, thereby causing said second shaft member to move said operating handle from the OFF position to the ON position; wherein said first component is a first gear member; and wherein said transmission assembly further comprises a second gear member engaging said first gear member and said second component.

2. The transfer assembly of claim 1 wherein said transfer assembly has a THIRD position between the FIRST position and the SECOND position; wherein, when said transfer assembly moves from the FIRST position to the THIRD position, said second gear member rotates independently with respect to said second component; and wherein, when said transfer assembly moves from the THIRD position to the SECOND position, said second gear member and said second component rotate together.

3. The transfer assembly of claim 2 wherein said second component comprises a body and a projection extending outwardly from said body of said second component; wherein said second shaft member at least partially extends into said body of said second component; wherein said second shaft member has a longitudinal axis; wherein said second gear member comprises a body and a protrusion extending outwardly from said body of said second gear member; wherein, when said transfer assembly is in the FIRST position, said protrusion is spaced from said projection; and wherein, when said transfer assembly moves from the FIRST position to the THIRD position, said protrusion rotates between 10 degrees and 40 degrees with respect to the longitudinal axis in order to move into engagement with said projection.

4. The transfer assembly of claim 1 wherein said transmission assembly further comprises a housing member and a biasing element; wherein said biasing element is coupled to said housing member and said second gear member; wherein, when said transfer assembly is in the FIRST position, said biasing element biases said transfer assembly to the FIRST position; and wherein, when said transfer assembly is in the SECOND position, said biasing element biases said transfer assembly to the SECOND position.

5. The transfer assembly of claim 4 wherein said second shaft member has a longitudinal axis; wherein said biasing element is a compression spring comprising a first end portion and a second end portion disposed opposite said first end portion; wherein said first end portion is coupled to and is fixed with respect to said housing member; and wherein, when said transfer assembly moves from the FIRST position to the SECOND position, said second end portion rotates about the longitudinal axis.

6. The transfer assembly of claim 1 wherein said transmission assembly further comprises a first housing member and a second housing member coupled to said first housing member; wherein said second shaft member extends through said first housing member; wherein said first housing member has a grooved region; wherein said second housing member has a grooved region disposed adjacent said grooved region of said first housing member; wherein said first gear member comprises a body and a protrusion extending outwardly from said body; and wherein said protrusion is structured to rotate within said grooved region of said first housing member and said grooved region of said second housing member.

7. The transfer assembly of claim 1 wherein said transmission assembly further comprises a first housing member and a second housing member coupled to said first housing member; wherein said second shaft member extends through said first housing member; wherein said first gear member comprises a body and a protrusion extending outwardly from said body; wherein said body has a number of teeth disposed internal with respect to said first housing member and said second housing member; and wherein said protrusion is disposed external with respect to said first housing member and said second housing member.

8. The transfer assembly of claim 1 wherein said first gear member is a first bevel gear member; wherein said second gear member is a second bevel gear member having a thru hole; wherein said second component extends at least partially into the thru hole; and wherein said second shaft member has a longitudinal axis extending through the thru hole.

9. The transfer assembly of claim 1 wherein said transmission assembly further comprises a first housing member, a second housing member coupled to said first housing member, a mounting member, and a number of coupling members; wherein said second shaft member extends through said first housing member; wherein said mounting member has an elongated slot; and wherein said number of coupling members extend through said slot and into one of said first housing member and said second housing member in order to couple said mounting member to said first housing member and said second housing member.

10. A switching assembly of an electrical enclosure, said switching assembly comprising:

an electrical switching apparatus having an operating handle structured to move from an OFF position to an ON position; and

a transfer assembly comprising:

a driving handle,

a first shaft member coupled to said driving handle,

a second shaft member coupled to said operating handle, and

a transmission assembly comprising a first component and a second component, said first component being coupled to said first shaft member, said second component being coupled to said second shaft member,

wherein said transfer assembly is structured to move from a FIRST position to a SECOND position,

wherein, when said transfer assembly moves from the FIRST position to the SECOND position, said first component drives said second component, thereby causing said second shaft member to move said operating handle from the OFF position to the ON position; wherein said first component is a first gear member; and wherein said transmission assembly further com-

prises a second gear member engaging said first gear member and said second component.

11. The switching assembly of claim **10** wherein said operating handle comprises a receiving portion and a distal portion disposed opposite said receiving portion; and wherein said second shaft member extends at least partially into said receiving portion.

12. The switching assembly of claim **11** wherein said second shaft member has a rectangular-shaped cross section; and wherein said receiving portion is shaped corresponding to the rectangular-shaped cross section of said second shaft member.

13. The switching assembly of claim **10** wherein said electrical switching apparatus comprises a compact circuit protector and a fuse electrically connected to said compact circuit protector; wherein said compact circuit protector comprises a wall member; and wherein said second shaft member extends through said wall member.

14. An electrical enclosure comprising:

a number of enclosure members cooperatively structured to form an enclosed region; and

a switching assembly comprising:

an electrical switching apparatus disposed within the enclosed region, said electrical switching apparatus having an operating handle structured to move from an OFF position to an ON position, and

a transfer assembly comprising:

a driving handle disposed external with respect to the enclosed region,

a first shaft member coupled to said driving handle,

a second shaft member coupled to said operating handle, and

a transmission assembly comprising a first component and a second component, said first component being coupled to said first shaft member, said second component being coupled to said second shaft member,

wherein said transfer assembly is structured to move from a FIRST position to a SECOND position,

wherein, when said transfer assembly moves from the FIRST position to the SECOND position, said first component drives said second component, thereby causing said second shaft member to move said operating handle from the OFF position to the ON position; wherein said first component is a first gear member; and wherein said transmission assembly further comprises a second gear member engaging said first gear member and said second component.

15. The electrical enclosure of claim **14** wherein said number of enclosure members comprises a door member; wherein said first shaft member extends through said door member; and wherein said door member is disposed between said driving handle and said transmission assembly.

16. The electrical enclosure of claim **14** wherein said number of enclosure members comprises a panel member; wherein said transmission assembly further comprises a first housing member, a second housing member coupled to said first housing member, a mounting member coupled to said panel member, and a number of coupling members; wherein said second shaft member extends through said first housing member; wherein said mounting member has an elongated slot; and wherein said number of coupling members extend through said slot and into one of said first housing member and said second housing member in order to couple said mounting member to said first housing member and said second housing member.

17. The electrical enclosure of claim **16** wherein said mounting member comprises a first planar portion and a second planar portion extending from and being disposed perpendicular to said first planar portion; and wherein said first planar portion is flush with and coupled to said panel member.

18. The electrical enclosure of claim **14** wherein said transfer assembly has a THIRD position between the FIRST position and the SECOND position; wherein, when said transfer assembly moves from the FIRST position to the THIRD position, said second gear member rotates independently with respect to said second component; and wherein, when said transfer assembly moves from the THIRD position to the SECOND position, said second gear member and said second component rotate together.

19. The electrical enclosure of claim **18** wherein said second component comprises a body and a projection extending outwardly from said body of said second component; wherein said second shaft member at least partially extends into said body of said second component; wherein said second shaft member has a longitudinal axis; wherein said second gear member comprises a body and a protrusion extending outwardly from said body of said second gear member; wherein, when said transfer assembly is in the FIRST position, said protrusion is spaced from said projection; and wherein, when said transfer assembly moves from the FIRST position to the THIRD position, said protrusion rotates between 10 degrees and 40 degrees with respect to the longitudinal axis in order to move into engagement with said projection.

* * * * *