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(54) Title: AN ARRANGEMENT FOR A CABLE CLAMP WITH LOCKING MECHANISM

(57) Abstract: A clamping arrangement 100 for holding a cable 112 is disclosed. The arrangement 100 includes a first part 102 and a second part 104. The first part 102 and the second part 104 have a substantially curved region. The first part 102 and the second part 104 are connected by a hinge 106 at one end and having a locking structure 108 at the other end such that the first part 102 and second part 104 form a cable enclosure in a closed position. At least one of the parts have one or more slots 114 such that each slot 114 has at least one roller 116 such that at least a part of the roller 116 is partially inside the clamping arrangement 100. The roller 116 is placed perpendicular to the cable 112 to restrict a movement of the cable 112 in only one direction.

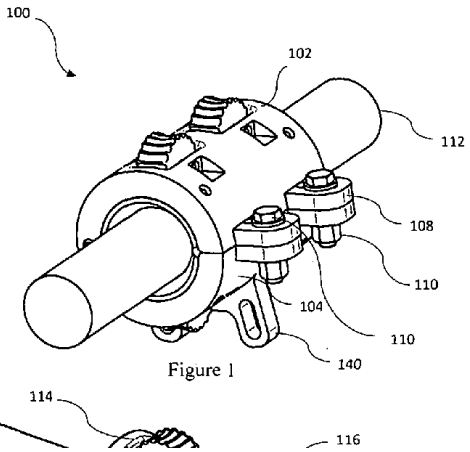
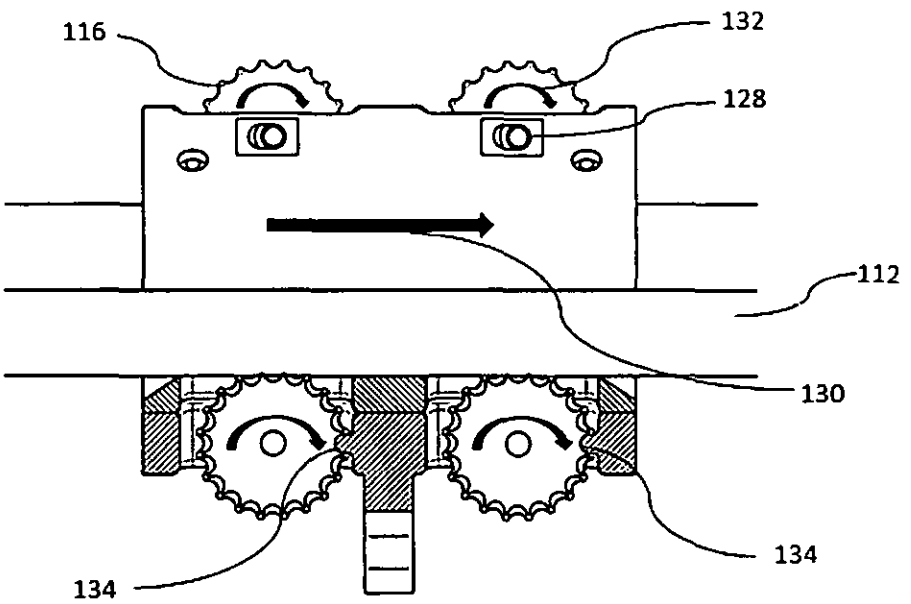


Figure 1

ABSTRACT

An Arrangement for a Cable Clamp with Locking Mechanism

A clamping arrangement 100 for holding a cable 112 is disclosed. The arrangement 100 includes a first part 102 and a second part 104. The first part 102 and the second part 104 have a substantially curved region. The first part 102 and the second part 104 are connected by a hinge 106 at one end and having a locking structure 108 at the other end such that the first part 102 and second part 104 form a cable enclosure in a closed position. At least one of the parts have one or more slots 114 such that each slot 114 has at least one roller 116 such that at least a part of the roller 116 is partially inside the clamping arrangement 100. The roller 116 is placed perpendicular to the cable 112 to restrict a movement of the cable 112 in only one direction.



We Claim:

1. A clamping arrangement 100 for holding a cable 112, the clamping arrangement 100 comprising:

a first part 102 having a substantially curved region; and

a second part 104 having a substantially curved region, the first part 102 and the second part 104 being connected by a hinge 106 at one end and having a locking structure 108 at the other end such that the first part 102 and second part 104 form a cable enclosure in a closed position;

wherein at least one of the parts have one or more slots 114, each slot 114 has at least one roller 116 such that at least a part of the roller 116 is partially inside the clamping arrangement, the arrangement being such that roller 116 is perpendicular to the cable 112 to restrict a movement of the cable 112 in only one direction.

2. The arrangement 100 as claimed in claim 1, wherein the first part 102 and second part 104 further comprising two half-cushions 118 placed in inner sides of the first part 102 and the second part 104 to cushion at least a portion of the cable.

3. The arrangement 100 as claimed in claim 2, wherein the two half-cushions 118 have one or more slots 122 for enabling at least one roller to make contact with the cable.

4. The arrangement 100 as claimed in claim 1, wherein the hinge 106 further includes a fastener 150 to connect the first part 102 and the second part 104.

5. The arrangement 100 as claimed in claim 1, wherein the locking structure 108 enables to lock the first part 102 and the second part 104.

6. The arrangement 100 as claimed in claim 1, wherein the cable 112 is a lower power electrical distribution cable, telephone cable, cable television cable or fiber optical cable.

Dated this 29th day of December 2017

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FIELD OF INVENTION

The invention relates to cable clamps and more particularly to suspending cables mounted aerially using poles or other overhead support structures.

BACKGROUND

Power cables are frequently suspended aerially from poles, towers or other support structures. An aerial arrangement of the power cables has the advantages of relatively simple and flexible installation and allows space substantially below the cables for other purposes. Diverse forms of clamping arrangements for cables or pipes are known. Existing cable clamps are designed in a way that they can only be hanged inside the tower peak. There is a need for a cable clamp to be designed in such a way that it can be mounted above the tower peak and the cable can be strung from outside the tower peak. Also, once the cable is placed in an enclosure, it is often desirable to allow the cable to move forward and block reverse movement of the cable so that movement of the cable is unidirectional. The existing clamps fail to address the aforementioned issues.

Hence, there is a need for an improved cable clamp to overcome the limitations set forth above.

SUMMARY OF THE INVENTION

Exemplary embodiments of the invention disclose a clamping arrangement for holding a cable. The arrangement comprises a first part and a second part having a substantially curved region. The first part and the second part are connected by a hinge at one end and having a locking structure at the other end such that the first part and second part form a cable enclosure in a

closed position. At least one of the parts have one or more slots wherein each slot has at least one roller such that at least a part of the roller is partially inside the clamping arrangement. The arrangement is such that the roller is perpendicular to the cable to restrict a movement of the cable in only one direction.

BRIEF DESCRIPTION OF DRAWINGS

Other objects, features, and advantages of the invention will be apparent from the following description when read with reference to the accompanying drawings. In the drawings, wherein like reference numerals denote corresponding parts throughout the several views:

Figure 1 illustrates a front isometric view of a clamping arrangement holding a cable, according to an exemplary embodiment of the invention;

Figure 2 illustrates a back isometric view of a clamping arrangement holding a cable, according to an exemplary embodiment of the invention;

Figure 3 illustrates a front perspective view of a cable clamping arrangement, according to an exemplary embodiment of the invention;

Figure 4 illustrates a back perspective view of a cable clamping arrangement, according to an exemplary embodiment of the invention;

Figure 5 illustrates a top perspective view of a cable clamping arrangement, according to an exemplary embodiment of the invention;

Figure 6 illustrates a bottom perspective view of a cable clamping arrangement, according to an exemplary embodiment of the invention;

Figure 7 illustrates a top view of a cable clamping arrangement, according to an exemplary embodiment of the invention;

Figure 8 illustrates a side view of a cable clamping arrangement, according to an exemplary embodiment of the invention;

Figure 9 illustrates an exploded view of a first part and a second part of a cable clamping arrangement, according to an exemplary embodiment of the invention;

Figure 10 illustrates a front view of a cable clamping arrangement, according to an exemplary embodiment of the invention;

Figure 11 illustrates a back view of a cable clamping arrangement, according to an exemplary embodiment of the invention;

Figure 12 illustrates partial cross-sectional view of the clamping arrangement to demonstrate roller locking mechanism, according to an exemplary embodiment of the invention;

Figure 13 illustrates full cross-sectional view of the clamping arrangement to demonstrate roller locking mechanism, according to an exemplary embodiment of the invention;

Figure 14 illustrates partial cross-sectional view of the clamping arrangement to demonstrate roller unlocking mechanism, according to an exemplary embodiment of the invention; and

Figure 15 illustrates full cross-sectional view of the clamping arrangement to demonstrate roller unlocking mechanism, according to an exemplary embodiment of the invention.

DETAILED DESCRIPTION OF DRAWINGS

The following description with reference to the accompanying drawings is provided to assist in a comprehensive understanding of exemplary embodiments of the invention. It includes various specific details to assist in that understanding but these are to be regarded as merely exemplary. Accordingly, those of ordinary skill in the art will recognize that various changes

and modifications of the embodiments described herein can be made without departing from the scope and spirit of the invention. In addition, descriptions of well-known functions and constructions are omitted for clarity and conciseness.

Figures 1 and 2 illustrates a front and back isometric view respectively of a clamping arrangement 100 holding a cable, according to an exemplary embodiment of the invention. The clamping arrangement 100 may be suitable for suspending a cable from an associated overhead structure, such from as an overhead support wire, an overhead high-tension power line tower, or the like. The clamping arrangement 100 may also be suitable for rigid mounting to an overhead high-tension power line tower or the like. According to an embodiment, the cable may be a lower power electrical distribution cable, telephone cable, cable television cable or fibre optical cable. According to another embodiment, the cable may be a OPGW (optical ground wire).

The clamping arrangement 100 includes a first part 102 and a second part 104. The first part 102 and the second part 104 form a clamp body. According to an exemplary embodiment, the first part 102 and the second part 104 may be of arc shape. According to an exemplary embodiment, the first part 102 and the second part 104 may be made of cast aluminium pieces for supporting high tension power transmission cables. The first part 102 and the second part 104 are connected by a hinge 106 at one end and a locking structure 108 at the other end. According to an embodiment, the first part 102 and the second part 104 may be hinged using a set of bolt-and-nut fastener pairs 110. The first part 102 and the second part 104 form a cable channel in locked position. The cable channel holds the clamped portion of the cable. According to an embodiment, the second part 104 may contain provision 140 for assembly of the clamp onto the tower. According to another embodiment the clamp may be permanently

fixed to the tower by welding it. The clamping arrangement 100 enables to assemble the clamp onto the tower either from inside (suspension) or on the outside (rigid fixing).

The first part 102 and the second part 104 have one or more slots 114. Each slot 114 has at least one roller 116. The arrangement of the roller is such that at least a part of the roller 116 is inside the clamping arrangement. The roller 116 is placed perpendicular to the cable 112 to restrict a movement of the cable 112 in only one direction.

Figures 3, 4, 5 and 6 illustrate front, back, top and bottom perspective views respectively of a cable clamping arrangement, according to an exemplary embodiment of the invention.

Figure 7 and Figure 8 illustrates a top view and a side view of a cable clamping arrangement respectively, according to an exemplary embodiment of the invention.

Figure 9 illustrates an exploded view of a first part and a second part of a cable clamping arrangement, according to an exemplary embodiment of the invention. The first part 102 and the second part 104 may include half-cushions 118 placed in inner sides of the first part 102 and the second part 104, according to an embodiment of the invention. The first part 102 and the second part 104 cushion at least a portion of the cable. According to another embodiment of the invention, the half cushions 118 may have one or more slots 122 for enabling roller 116 to make contact with the cable. According to yet another embodiment of the invention, the half-cushions 118 may have small protrusions 120 to hold the half-cushions 118 in place when the cable is passed through the clamp. The fasteners 124 are used to fix the rollers 116 in the clamp. The fastener 150 is used to hinge the first part 102 and the second part 104. According to an exemplary embodiment, the fastener may be a pin.

Figure 10 and 11 illustrates a front view and back view respectively of a cable clamping arrangement, according to an exemplary embodiment of the invention.

Figures 12, 13, 14 and 15 illustrate a locking and an unlocking mechanism for unidirectional movement of a cable enclosed in a clamping arrangement, according to an exemplary embodiment of the invention. The locking mechanism uses a roller locking system to restrict cable movement in one direction. The rollers are allowed to move freely inside the slots provided in the first part and the second part of the clamping arrangement. The rollers are designed in such a way that once the cable passes through the clamp, the cable will have movement in only one direction and the movement of the cable in opposite direction is restricted. According to an embodiment of the invention, the first part and the second part have a sliding arrangement to lock and unlock the movement of the rollers.

Figure 12 illustrates partial cross-sectional view of the clamping arrangement and Figure 13 illustrates full cross-sectional view of the clamping arrangement, to demonstrate roller locking mechanism, according to an exemplary embodiment of the invention.

The sliding arrangement for the rollers 116 enables the rollers to slide in the sliding slot 128. When the cable is pulled in the opposite direction 130 to an original movement of the cable, the movement of the rollers 132 is also in the opposite direction to the original movement of the cable. The rollers 116 tend to move in the sliding arrangement and slide in the slot 128. When the rollers 116 slide to the rightmost end of the sliding slot, the rollers 116 get locked at position 134 as shown in Figure 7A. The locking of the rollers 116 restricts the movement of the cable in the opposite direction 130. Thus, unidirectional movement of the cable is achieved using the roller-locking mechanism.

Figure 14 illustrates a partial cross-sectional view of the clamping arrangement and Figure 15 illustrates a full cross-sectional view of the clamping arrangement, to demonstrate roller unlocking mechanism, according to an exemplary embodiment of the invention.

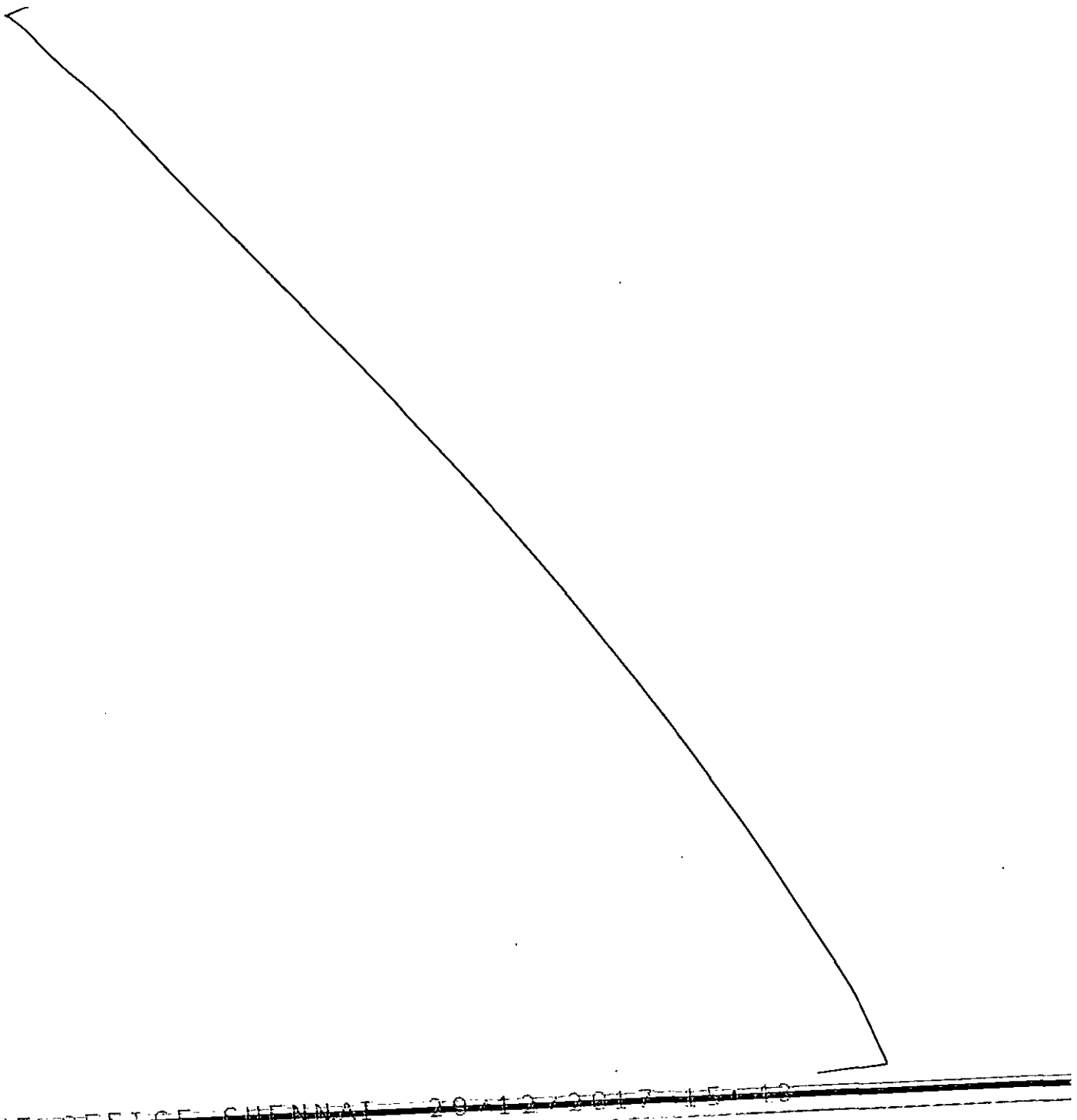
When the cable is pulled in the forward direction 136 in line with the original direction of movement of the cable, the movement of the rollers 138 is also in the forward direction. The rollers 116 tend to move in the sliding slot 128 towards the direction 136. When the rollers 116 slide to the leftmost end of the sliding slot 128, the rollers do not get locked and there is no hindrance to the movement of the cable in the forward direction.

The disclosed cable clamping arrangement has at least advantages of enabling easy set-up of the clamping arrangement on top of tower, rigid mounting of the clamp on the tower, reduction in cable stringing time, unidirectional cable movement and minimizes effort and time in manual as well as heli-stringing of cables.

In the drawings and specification there has been set forth preferred embodiments of the invention, and although specific terms are employed, these are used in a generic and descriptive sense only and not for purposes of limitation. Changes in the form and the proportion of parts, as well as in the substitution of equivalents, are contemplated as circumstances may suggest or render expedient without departing from the spirit or scope of the invention.

It is understood that the above description is intended to be illustrative, and not restrictive. It is intended to cover all alternatives, modifications and equivalents as may be included within the spirit and scope of the invention as defined in the appended claims. Many other

embodiments will be apparent to those of skill in the art upon reviewing the above description. The scope of the invention should, therefore, be determined with reference to the appended claims, along with the full scope of equivalents to which such claims are entitled. In the appended claims, the terms "including" and "in which" are used as the plain-English equivalents of the respective terms "comprising" and "wherein," respectively.



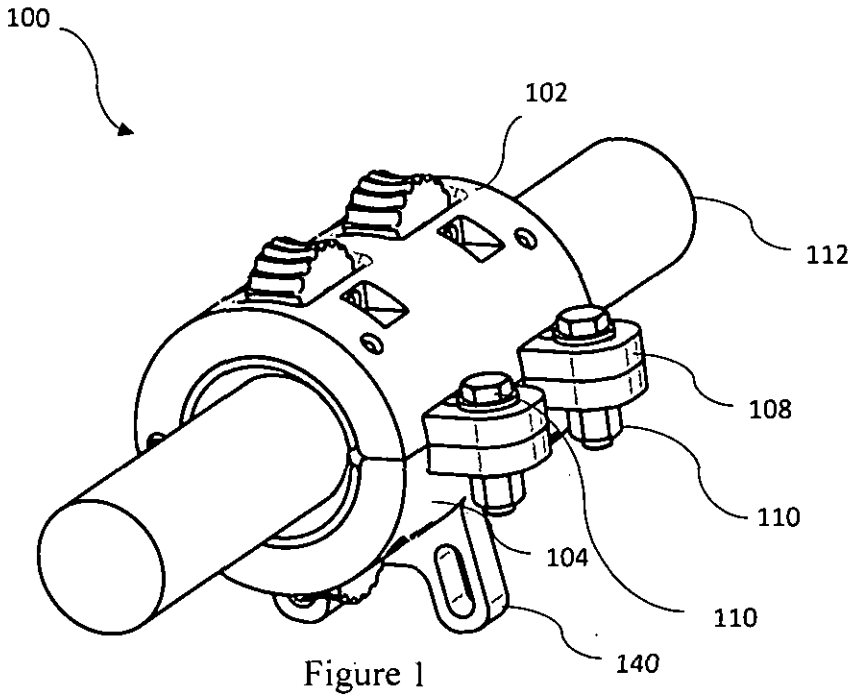


Figure 1

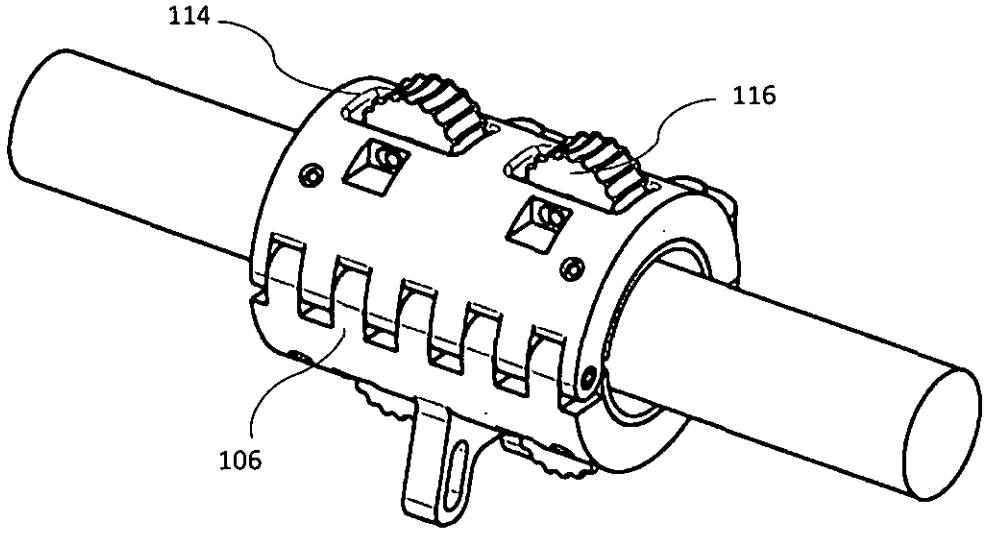


Figure 2

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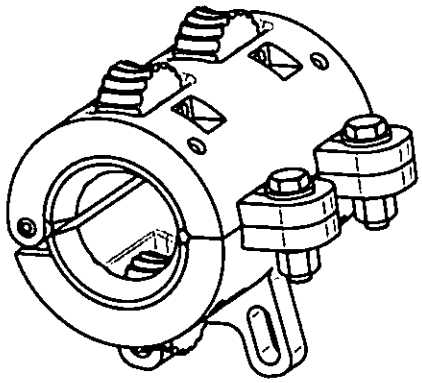

Figure 3

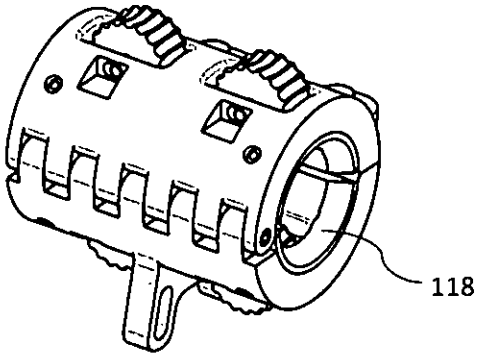

Figure 4

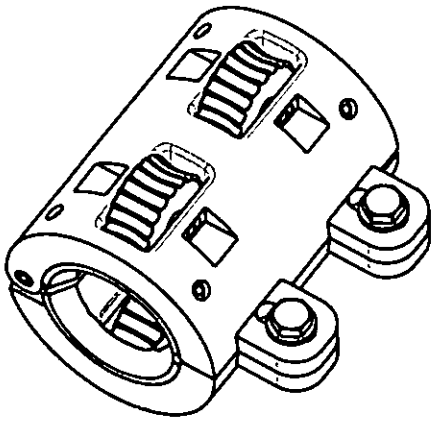

Figure 5

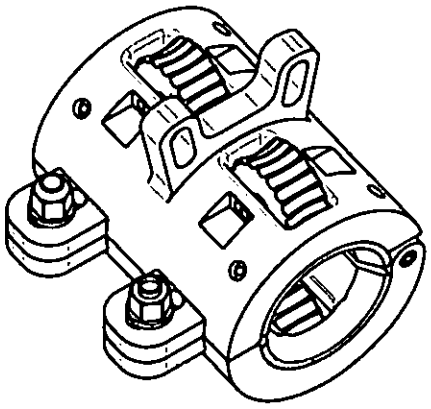

Figure 6

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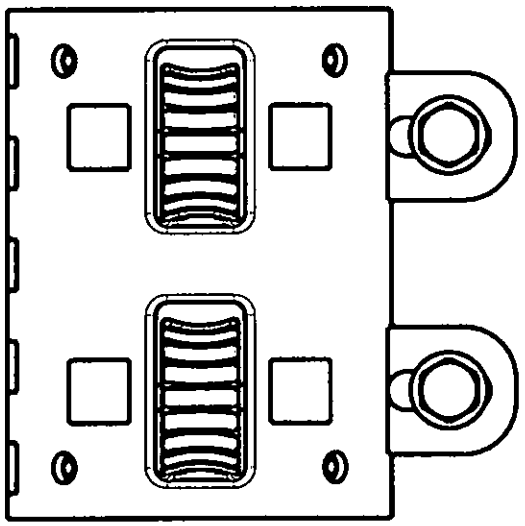

Figure 7

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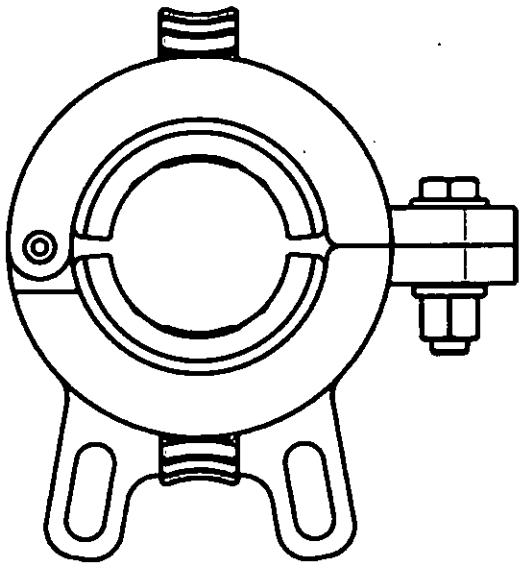

Figure 8

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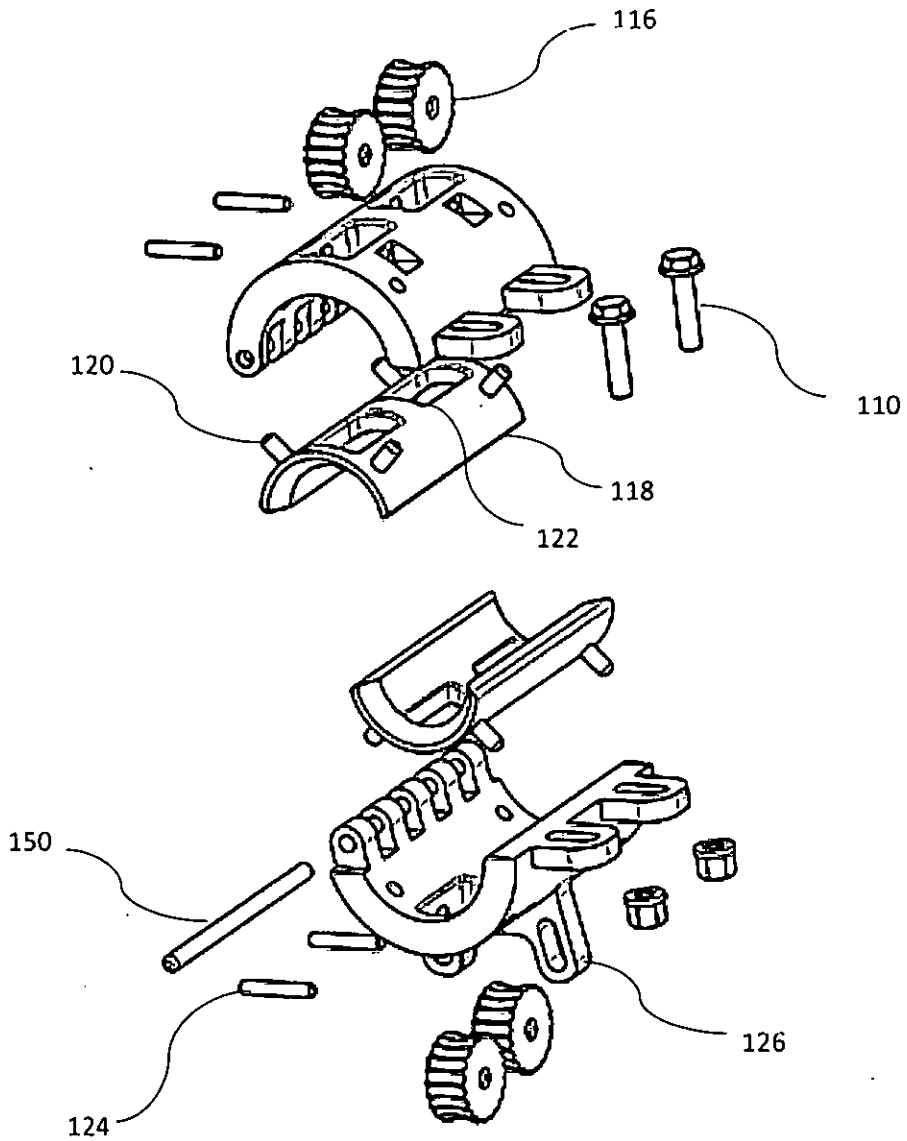

Figure 9

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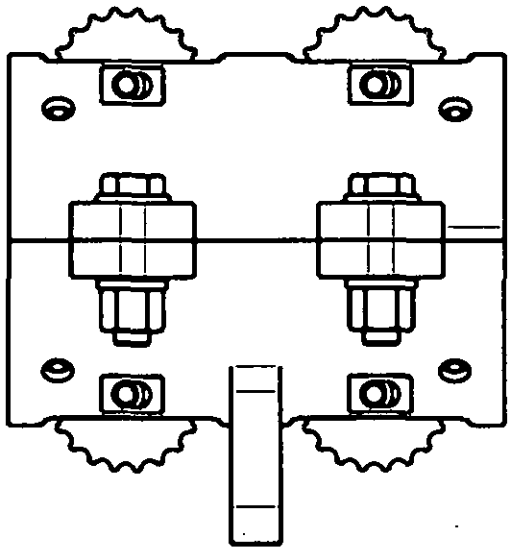

Figure 10

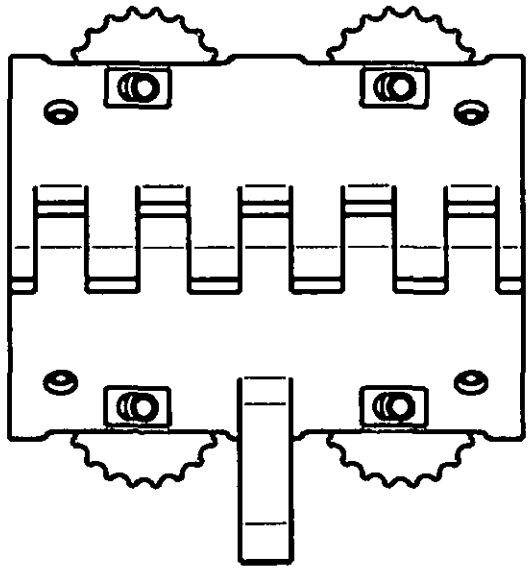

Figure 11

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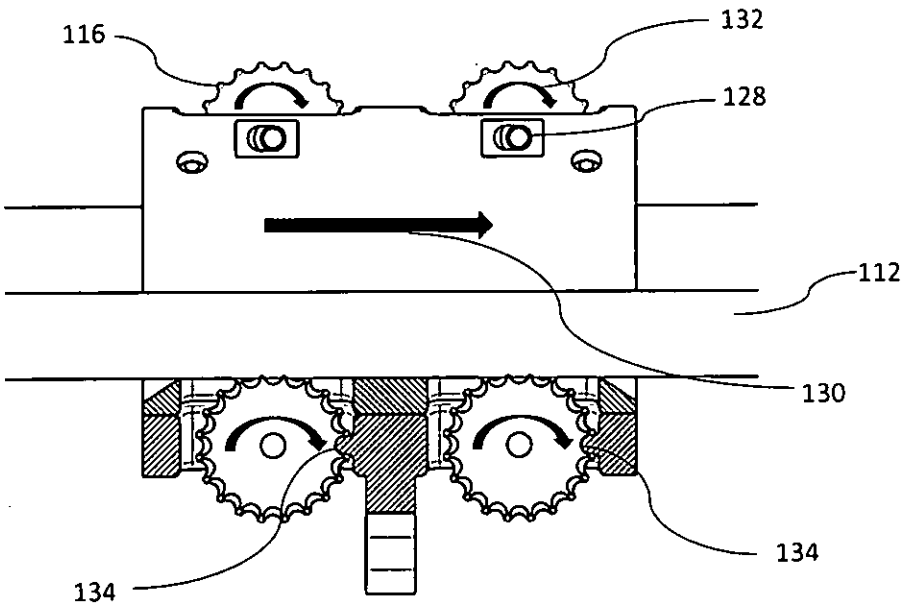

Figure 12

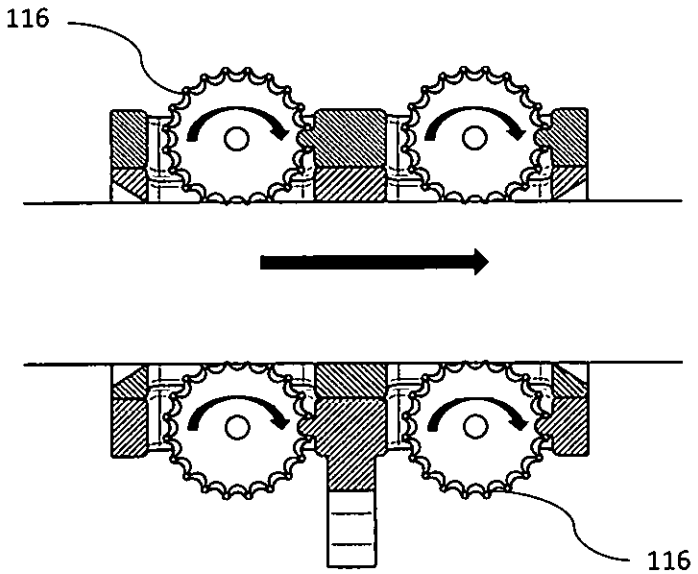

Figure 13

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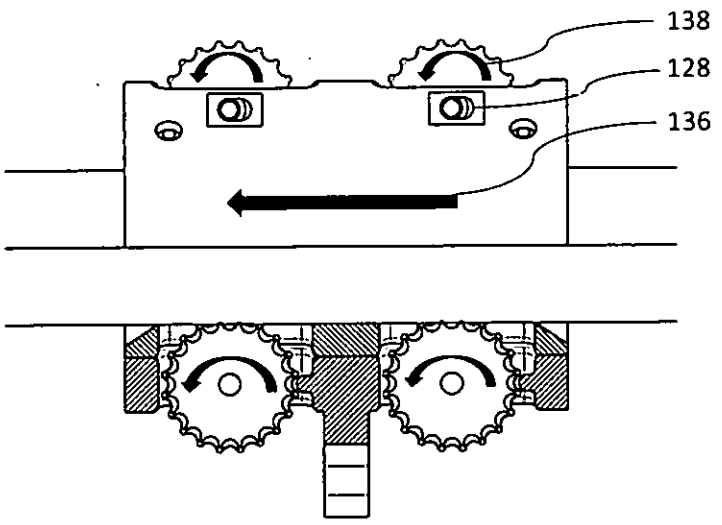

Figure 14

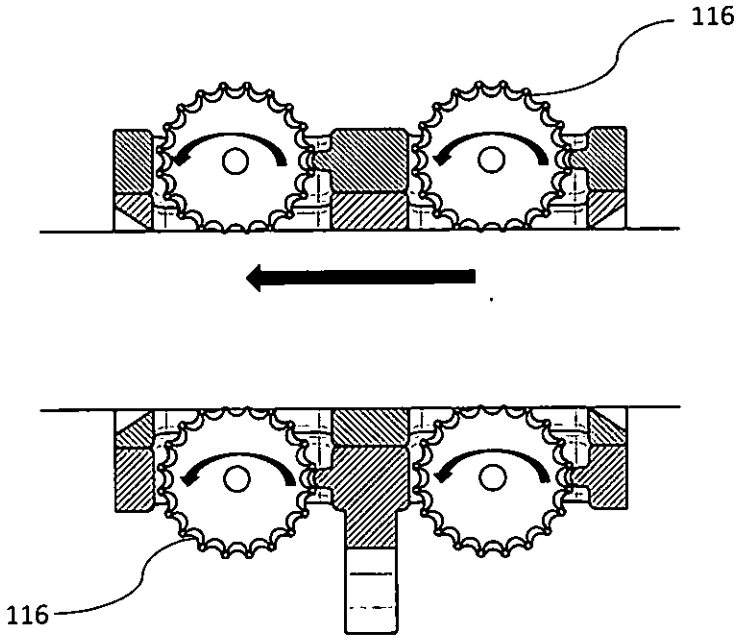

Figure 15

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