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(71) Applicant
Stanley Leonard Harris,
Musits, Touchen End, Maidenhead, Berkshire

(72) Inventors
Stanley Leonard Harris
Samuel John Berry Rowan

(74) Agent and/or Address for Service
Urquhart-Dykes and Lord,
Trinity Court, Trinity Street, Priestgate, Peterborough,
Cambs PE1 1DA

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GB A 2152998	GB 1116274	US 4355444
GB A 2139659	GB 0272418	US 4302869
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A44B

(54) Connecting devices and methods of connecting

(57) A connecting device, particularly applicable to ropes and other tension members comprises a generally pear-shaped or triangular structure providing a pair of converging gripping members 12, 14 defining a nip 16 into which a tension member can be inserted. The arrangement is such that the tension member can be securely connected to the device merely by insertion into the nip and applying tension between the tension member and the device. The invention is particularly applicable to the fastening of flexible panels to lorries, trucks and the like. The gripping members may be of steel rod, of round or polygonal, e.g. triangular, cross-section, and may be flexible.

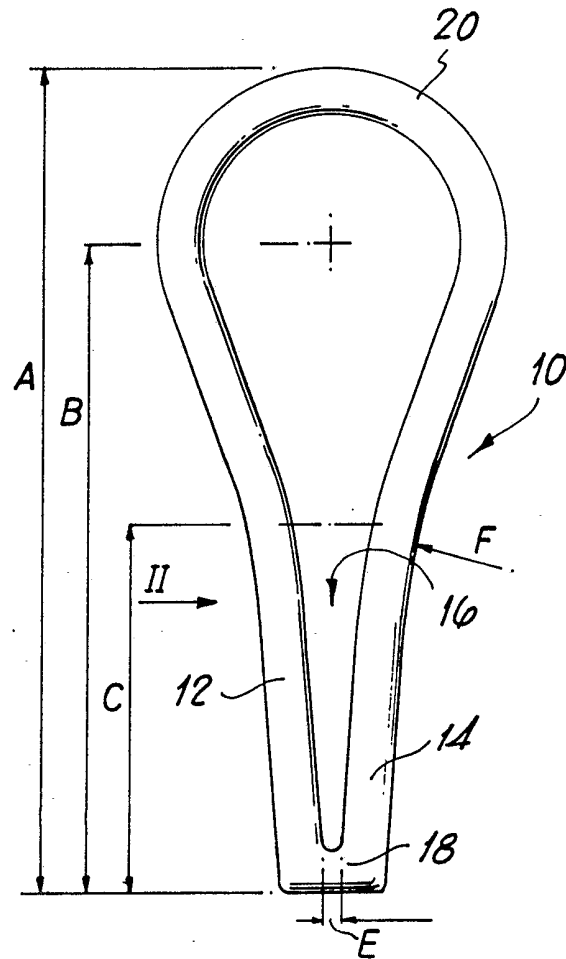


FIG.1

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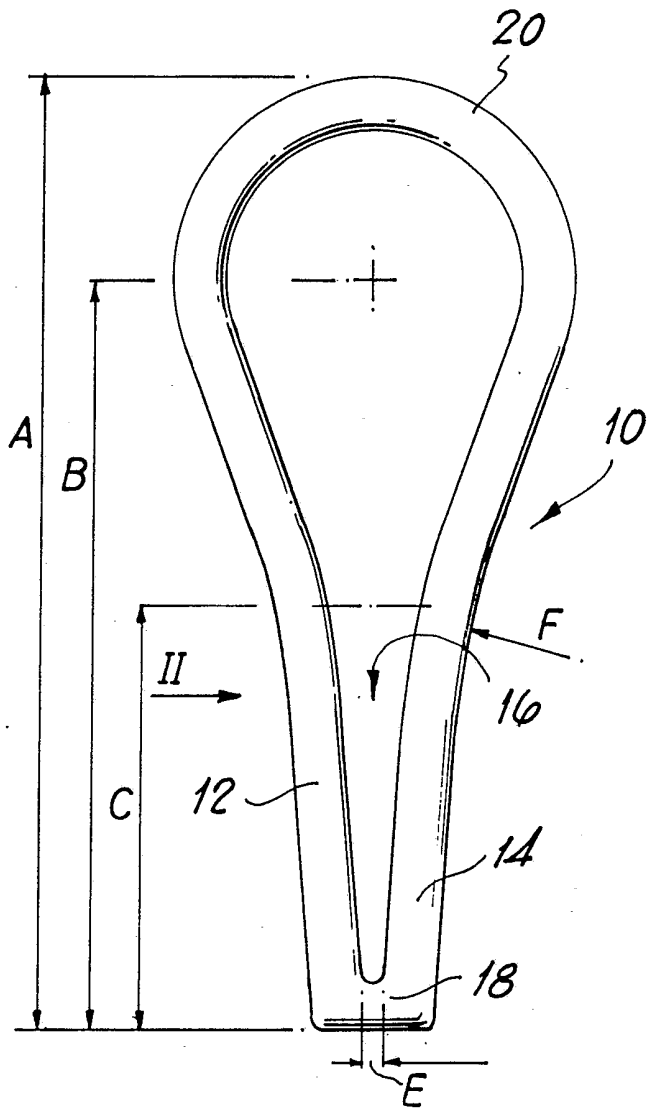


FIG. 1

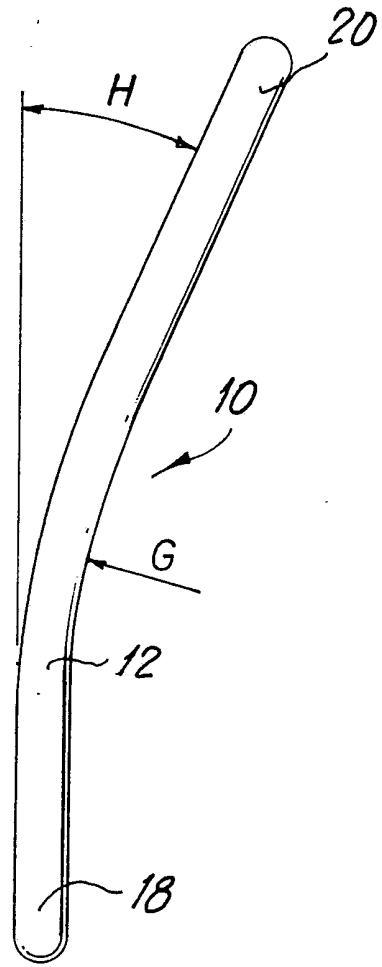


FIG. 2

SPECIFICATION

Connecting devices and methods of connecting

5 This invention relates to connecting devices and methods of connecting. The invention is particularly applicable to connecting devices for ropes and other tension members. An example of the application of the invention is to connecting devices for use in securing loads to road vehicles such as trucks or lorries, and to devices for securing the flexible sheet material side panels of lorries in their lowered position.

10 In the case of road haulage vehicles, there is a statutory requirement for loads carried thereon to be properly secured. This requirement is usually met by the use of tension members such as ropes, cables and the like to secure the load in position on the floor of the lorry. For this purpose, there is a need for some effective means for readily securing the rope or other tension member to the body of the lorry.

15 Presently available means for meeting these requirements for securing loads to lorries and for fastening their flexible sheet material side panels include the use of conventional ropes and hook devices secured to the lorry and, in the case of the side panels, the use of conventional buckle and strap fasteners.

20 Such provision is reasonably satisfactory provided the user is adequately adept at knotting the rope to the fastener hook in a tensioned condition, and likewise in operating the buckle and strap devices. Nevertheless, these arrangements, and other existing provisions for carrying out the same tasks leave a lot to be desired. Thus, they are not particularly easy to use. Though moderately simple, they are not particularly effective to enable connection of the tension member in a tensioned condition. The buckle and strap arrangements are relatively expensive. Moreover, and perhaps this is paramount, neither arrangement enables relatively quick fastening of the tension member.

25 Thus, there is a need for a connecting device and a method of using same for ropes and other tension members which is simple and easy to use, effective and relatively inexpensive, while also permitting relatively quick connection of a tension member thereto. It is an aim of the present invention to provide a connecting device and a method of using same offering improvements in relation to one or more of these requirements, or generally.

30 According to the invention there is provided a connecting device for ropes and other tension members having a pair of converging gripping members defining a nip into which a tension member can be inserted, the arrangement being such that a tension member can be securely connected to the device merely by

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insertion into the nip and applying tension between the tension member and the device.

70 The invention also provides a method of connecting a rope or other tension member to a connecting device, the method comprising the steps of providing a connecting device as defined in the last preceding paragraph, inserting the tension member into the nip thereof, and applying tension between the tension

75 member and the connecting device.

80 Preferably, the connecting device is generally of tapering form, having a wide end remote from the nip, for insertion of a tension member. The connecting device may have a closed structure generally of pear shaped or triangular form.

85 Preferably, the converging gripping members defining said nip comprise material having a round cross-sectional shape. The gripping members may be formed of steel rod.

90 The invention also provides a vehicle such as a lorry, truck or the like having a series of connecting device for securing a corresponding series of tension members to the body of the vehicle in tensioned condition to secure a load, or to secure a flexible panel or cover of the vehicle, characterised in that the connecting devices each comprise a device as defined above. The connecting devices may be secured or fixed to the body of the vehicle.

95 In the case where the connecting device is not fixed rigidly to the body of a vehicle or other structure and can be therefore manipulated in the connecting operation, the provision of a closed structure for the connecting device, such as a pear shaped or triangular form, is of utility in that the end of the connecting device remote from the nip can be employed to apply tension to the device after engagement of the rope or other tension member with the nip, thereby increasing the grip between the two. Effectively, the pear or triangular shape assists the user to increase the tension applied to the assembly and thus to increase the degree of grip provided.

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110 The invention also provides a connecting device, and a method of using same, not limited by all the features of the broadest definitions of the invention above, but comprising any novel feature or novel combination of features disclosed herein.

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120 An embodiment of the invention will now be described by way of example with reference to the accompanying drawings in which:

Fig. 1 shows a plan view of a connecting device; and

Fig. 2 shows a side view of the device of Fig. 1, the direction of viewing being indicated by arrow II in Fig. 1.

125 As shown in the drawings, a connecting device 10 for ropes and other tension members comprises a pair of converging gripping members 12, 14 defining a nip 16 into which a tension member (not shown) such as a rope can be inserted. The arrangement is such that

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the tension member can be securely connected to the device 10 merely by insertion into the nip 16 and applying tension between the rope and the device.

5 As shown in the drawings, connecting device 10 is generally of tapering form having a closed narrow end 18, at the nip end, and a wide opposite end 20, which is likewise closed. The overall structure is generally pear shaped. Alternative shapes could be adopted such as a generally triangular form or other forms according to particular requirements.

10 The entire connecting device 10 is formed from round section steel rod. In the specific embodiment, the rod is of 10 millimetre or 0.39 inch diameter. Other dimensions of the specific embodiment are indicated in the drawings by reference letters A to H, and by way of example are quoted below as follows:

- 20 A : 190 millimetres
 B : 150 millimetres
 C : 80 millimetres
 D : 18 millimetres
 E : 5 millimetres
 25 F : radius 180 millimetres
 G : radius 180 millimetres
 H : angle of 15 degrees

The above specific embodiment has been found to be particularly effective for connecting to a tension member in the form of a braided conventional rope of sisal, hemp or other conventional materials having an outside diameter of approximately 14 millimetres. In use, the action of connecting the device to such a rope is almost instantaneous. The rope is merely placed in the nip and the slightest pull is sufficient to connect the rope to the device. The greater the tension applied, the more firmly the rope is pulled down into the nip and thereby the connection between the two is increased. Although tests to the destructive limits of the materials involved have not yet been carried out it seems likely that the automatic gripping and connecting function will be effective up to the strength limits of the materials involved, but certainly up to and probably beyond the tension requirements for all normal applications.

50 In the case of the application of the device to fastening flexible sheet material side panels of lorries and the like, the device could be applied in several possible ways. For example, the device could be secured to the side panels themselves or to a length of rope or other tension member secured thereto. Each device would be connected to a short length of rope or other tension member secured to the vehicle body. Alternatively, the devices could be fixed to the vehicle body, for example with the nips 16 facing upwards. Then, ropes or other tension members from the panel sides would be inserted into the nips and secured merely by a rapid pull on the rope. In such a case, the device would not necessarily need the pear shaped or correspondingly shaped

form described above.

70 It will be apparent from the above description that the invention will be quite widely applicable to the connecting of tension members to other structures. While the embodiment is particularly applicable to use with conventional ropes, it is to be expected that the device could be adapted for use with other tension members, including those having different cross-sectional shapes from ropes. The dimensions of the connecting members will vary according to the dimensions of the material to be secured. The converging form of the nip 16 enables it to accommodate a considerable variation of diameters however. Alternative cross-sectional shapes for the gripping members 12 and 14 may be possible. Perhaps the round section is the most universally applicable. However, a polygonal section may be effective and for certain applications a diamond or triangular section with the arrangement such that the points or angles of the diamond or triangle face towards each other, may be particularly effective for certain situations.

90 The nip itself must be constructed so as to exert a gripping action on the rope or other tension member. Some flexibility in the material employed may be advantageous. Too much flexibility may permit the rope or the like to be pulled out of the device.

95 In a further embodiment, not illustrated, the structure of the gripping device is substantially as described above, but the diameter of the round section metal thereof is approximately 5 centimetres or half that of the preceding embodiment. The form of the nip is modified slightly so that the nip itself comes to an actual point, or almost so, instead of there being provided as shown in Fig. 1 a well defined blunt end to the nip. This embodiment has been constructed for use with a particular sort of synthetic plastic rope, and functions substantially as described above.

110 CLAIMS

1. A connecting device for ropes and other tension members having a pair converging gripping members defining a nip into which a tension member can be inserted, the arrangement being such that a tension member can be securely connected to the device merely by insertion into the nip and applying tension between the tension member and the device.

120 2. A connecting device according to claim 1, the device being generally of tapering form, having a wide end remote from the nip, for insertion of a tension member.

125 3. A connecting device according to claim 1 or claim 2 having a closed structure generally of pear-shaped or triangular form.

130 4. A connecting device according to any one of the preceding claims wherein the converging gripping members defining said nip comprise material having a round cross-section

tional shape.

5. A connecting device according to any of claims 1 to 3 wherein the said nip comprises material having a polygonal cross-sectional shape.
- 5 6. A connecting device according to claim 5 wherein the said material has a diamond or triangular section arranged such that the points or angles of the diamond or triangle face towards each other.
- 10 7. A connecting device according to any one of the preceding claims wherein the said gripping members are formed of steel rod.
- 15 8. A connecting device according to any one of claims 1 to 7 wherein the said gripping members comprise a material having some flexibility.
- 20 9. A connecting device according to any one of the preceding claims wherein the said nip itself defines an actual point.
10. A connecting device according to any one of claims 1 to 9 wherein the said nip has a blunt end.
- 25 11. A connecting device substantially as described herein with reference to, and as shown in, the accompanying drawings.
12. A vehicle such as a lorry, truck or the like having a series of connecting devices for securing a corresponding series of tension members to the body of the vehicle in tensioned condition to secure a load, or to secure a flexible panel or cover of the vehicle, characterised in that said connecting devices each comprise a device according to any one of the preceding claims.
- 30 13. A vehicle according to claim 12 wherein the said connecting devices are secured or fixed to the body of the vehicle.
- 35 14. A method of connecting a rope or other tension member to a connecting device, the method comprising the steps of providing a connecting device according to any one of claims 1 to 11, inserting the tension member into the nip thereof, and applying tension between the tension member and the connecting device.
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