(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 2 230 656 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
22.09.2010 Bulletin 2010/38

(51) Int Cl.:
G09F 7/18 *(2006.01)* ***G09F 15/00*** *(2006.01)*

(21) Application number: **10156470.6**

(22) Date of filing: **15.03.2010**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO SE SI SK SM TR
Designated Extension States:
AL BA ME RS

(30) Priority: **16.03.2009 NL 2002630**

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(54) Tightening cord to connect a sail to a tube

(57) A tightening cord 1 comprises an elastic cord 3 with a hook 5 at one end and a coupling element 7 at the other end. The hook 5 and the coupling element 7 are provided with coupling means for coupling them together.

The coupling means are arranged such that the coupling element 7 can be detached from the hook 5 when moved in a direction 35 pointing away from the loop 33 and can be attached to the hook 5 when moved in a direction 37 pointing towards the loop 33. If the eyelet 29 pulls at the tightening cord 1, for example because the wind blows against the sail 39, the loop 33 pulls the coupling element 7 rigidly against the hook 5, so that the tightening cord coming loose is avoided.

Since the coupling element 7 is directly connected to the hook 5 during use, the eyelet 29 of a sail 39 can be pulled closer to a tube 31 the sail is attached to.

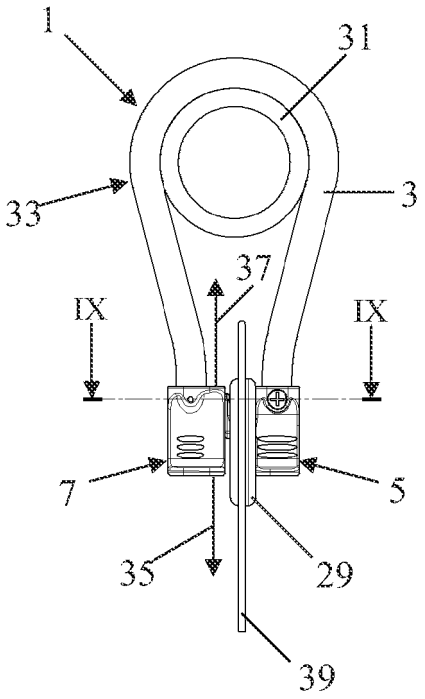

FIG. 5

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Description

Field of the invention.

[0001] The invention relates to a tightening cord for coupling an eyelet of a sail to a profile, for example a tube, which tightening cord comprises an elastic cord, as well as a hook which is connected to an end of the cord and which is formed by an elongated element of which one end is bent towards the other end and is present at a distance from the other end, which tightening cord further includes a coupling element which is attached to the other end of the cord, which hook has an inside wall whose wall portions are facing each other, and an outside wall whose wall portions are facing away from each other.

State of the art.

[0002] A tightening cord of this type is known from WO-A-2004/045899. This known tightening cord is suitable for tightening a car safety seat in a car. The coupling element of this known tightening cord can be fastened to an object, for example the car safety seat and the hook can be hooked behind something else, for example a component of the car. If this known hook were used for coupling an eyelet to a tube, with the hook being hooked behind the eyelet and the elastic cord being connected with the coupling element to the tube, there would be a chance that in the event of large forces exerted on the sail, for example with gusts of wind, the hook would be bent open and come loose from the eyelet.

Summary of the invention.

[0003] It is an object of the invention to provide a tightening cord of the type defined in the opening paragraph for which the chance of coming loose is reduced compared to the known tightening cord. To this end the tightening cord according to the invention is **characterised, in that** the hook on the outside wall facing outwards is provided with coupling means and the coupling element is provided with further coupling means which can cooperate with the coupling means of the hook. Since the coupling element is directly connected to the hook during use, and the hook and coupling element together form a U shape whose ends the cord is attached to and a pulling force is exerted during a load, the hook cannot be forced open and come loose from the eyelet. In addition, the hook and the coupling element are located beside the sail and there are no component parts extending beyond the sail. This provides a greater effective spring length between the hook and the object the sail is attached to, for example a tube, or the sail can be attached closer to the tube than with the customary tightening cord. Since the coupling means are further placed at the outside wall of the hook, the inside wall of the hook pointing inwards remains free for the coupling to the eyelet.

[0004] An embodiment of the tightening cord according to the invention is **characterised, in that** the coupling means and further coupling means are arranged such that if the cord is bent into a loop, while the two ends of the cord run parallel to each other, the coupling element can be detached from the hook when moved in a direction pointing away from the loop and can be attached to the hook when moved in a direction pointing towards the loop. If the eyelet pulls at the tightening cord, for example because the wind blows against the sail, the loop pulls the coupling element rigidly against the hook, so that the tightening cord coming loose is avoided.

[0005] A practical embodiment of the tightening cord according to the invention is **characterised, in that** the hook is U-shaped and with a leg of the U shape is attached to the cord, while the outside wall of the other leg of the U shape is provided with at least a single groove or rib extending in longitudinal direction of the leg, and the coupling element is provided with an elongated recess open at one end and provided with a rib or groove in a recess boundary wall extending in longitudinal direction of the recess and congruent with the elongated rib or groove. The free leg of the U-shaped hook preferably has two grooves or ribs facing each other and the wall of the recess also has two further ribs or further grooves facing each other and which can cooperate with the grooves or ribs of the hook.

[0006] A further embodiment of the tightening cord according to the invention is **characterised in that** the hook and/or the coupling member are made from a glass fibre or carbon fibre reinforced plastic.

[0007] A still further embodiment of the tightening cord according to the invention is **characterised in that** the hook and/or coupling member are attached to the cord by means of a pin or screw sticking transversely through the cord.

Brief description of the drawings.

[0008] The invention will be described in more detail based on examples of embodiment of the tightening cord according to the invention while reference is made to the appended drawing figures, in which:

Fig. 1 shows a perspective view of an embodiment of the tightening cord according to the invention in extended state;
Fig. 2 shows a side view of the tightening cord shown in Fig. 1;
Fig. 3 shows a plan view of the tightening cord;
Fig. 4 shows a cross-sectional view of the tightening cord;
Fig. 5 shows a front view of the tightening cord bent into a loop during the fastening of an eyelet to a tube;
Fig. 6 a side view of the tightening cord bent into a loop during the fastening of an eyelet to a tube;
Fig. 7 shows a cross-sectional view along the line VII - VII in Fig. 6 of a detail of the ends of the tightening cord coupled to each other and hooked around an

eyelet;
Fig. 8 shows the detail shown in Fig. 7 of the cross-sectional view along the line VIII - VIII in Fig. 6; and
Fig. 9 shows the detail shown in Fig. 7 of the cross-sectional view along the line IX - IX in Fig. 5.

Detailed description of the drawings.

[0009]

Fig. 1 shows a perspective view of an embodiment of the tightening cord according to the invention in extended state. The tightening cord 1 comprises an elastic cord 3 with a hook 5 attached to it at one end and a acoupling element 7 at the other.
Figs. 2, 3 and 4 show a side view, plan view and longitudinal view respectively of the tightening cord. The hook 5 has an inside wall 9 (see Figs. 2 and 4) whose wall portions are facing each other, and an outside wall 11 whose wall portions are facing away from each other. The outside wall 11 facing outwards has coupling means 13 (see Fig. 1) and the coupling element 7 has further coupling means 15 which can cooperate with the coupling means of the hook.

[0010] The hook 5 is U-shaped (see Figs. 2 and 4) and is attacted to the cord 3 with a leg 17. The outside wall of the other, free leg 19 has two ribs 21 facing each other, which extend in longitudinal direction of the leg and form part of the coupling means 13. The coupling element 7 is provided with an elongated recess 25 open at one end 23 and provided with grooves 27 congruent with the ribs 21 (see Fig. 4) in a recess boundary wall extending in longitudinal direction of the recess. These grooves 27 form part of the further coupling means 15.
[0011] Figs. 5 and 6 show a front view and side view respectively of the tightening cord 1 bent into a loop during the fixing of an eyelet 29 to a tube 31. The coupling means 13 and further coupling means 15 are arranged such that if the cord 3 is bent into a loop 33, as is shown in these drawing Figures, and the two ends of the cord are placed parallel to each other, the coupling element 7 can be detached from the hook when moved in a direction 35 pointing away from the loop 33 and be attached to the hook 5 when moved in a direction 37 pointing towards the loop 33. If the eyelet 29 pulls at the trightening cord 1, for example because the wind blows against the sail 39, the loop 33 pulls the coupling element 7 fixed to the hook 5, so that the tightening cord coming loose is avoided.
[0012] Figs. 7, 8 and 9 show for clarity the cross-sectional views along the lines VII - VII and VIII - VIII in Fig. 6 and line IX - IX in Fig. 5 of a detail of the ends of the tightening cord 1 coupled to each other and hooked around the eyelet 29. The hook 5 and the coupling element 7 are attached to the cord 3 by means of pins 41 sticking transversely through the cord (see Fig. 9), which pins are made of a glass fibre or carbon fibre reinforced plastic such as, for example, PA, PET, POM or PP.
[0013] Albeit the invention described above has been described in the foregoing with reference to the drawing figures, it should be established that the invention is not by any manner or means restricted to the embodiments shown in these drawing figures. The scope of the invention is also extended to any embodiments deviating from the embodiments shown in the drawing figures within the spirit and scope of the claims.

Claims

1. A tightening cord for coupling an eyelet of a sail to a profile, for example a tube, which tightening cord comprises an elastic cord, as well as a hook which is connected to an end of the cord and which is formed by an elongated element of which one end is bent towards the other end and is present at a distance from the other end, which tightening cord further includes a coupling element which is attached to the other end of the cord, which hook has an inside wall whose wall portions are facing each other, and an outside wall whose wall portions are facing away from each other, **characterised in that** the hook on the outside wall facing outwards is provided with coupling means and the coupling element is provided with further coupling means which can cooperate with the coupling means of the hook.

2. A tightening cord as claimed in claim 1, **characterised in that** the coupling means and further coupling means are arranged such that if the cord is bent into a loop, while the two ends of the cord run parallel to each other, the coupling element can be detached from the hook when moved in a direction pointing away from the loop and can be attached to the hook when moved in a direction pointing towards the loop.

3. A tightening cord as claimed in claim 2, **characterised in that** the hook is U-shaped and with a leg of the U shape is attached to the cord, while the outside wall of the other leg of the U shape is provided with at least a single groove or rib extending in longitudinal direction of the leg, and the coupling element is provided with an elongated recess open at one end and provided with a rib or groove in a recess boundary wall extending in longitudinal direction of the recess and congruent with the elongated rib or groove.

4. A tightening cord as claimed in claim 1, 2 or 3, **characterised in that** the hook and/or the coupling member are made from a glass fibre or carbon fibre reinforced plastic.

5. A tightening cord as claimed in any one of the preceding claims, **characterised in that** the hook and/or coupling member are attached to the cord by

means of a pin or screw sticking transversely through the cord.

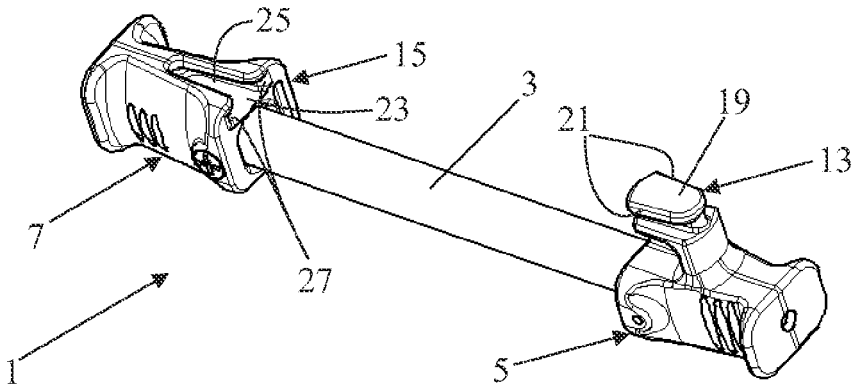

FIG. 1

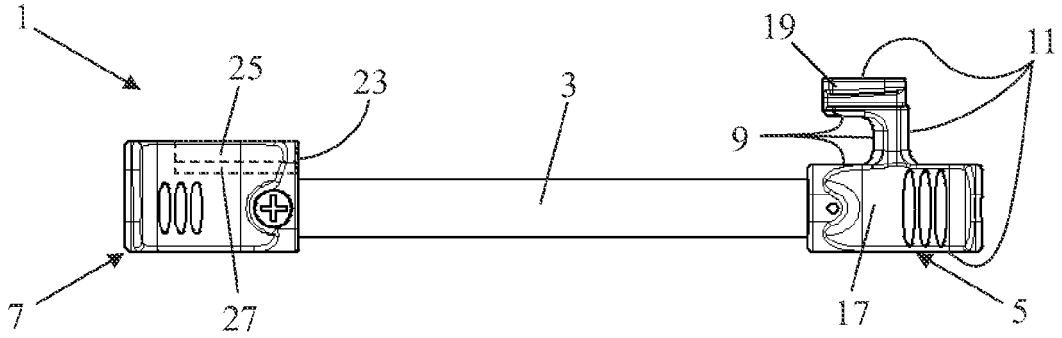

FIG. 2

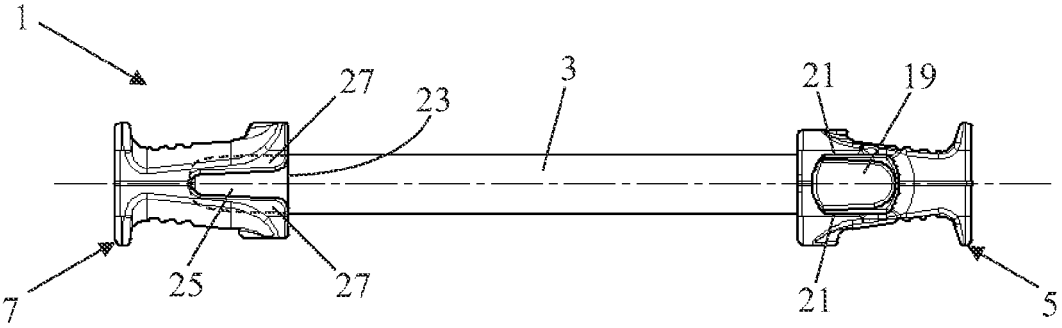

FIG. 3

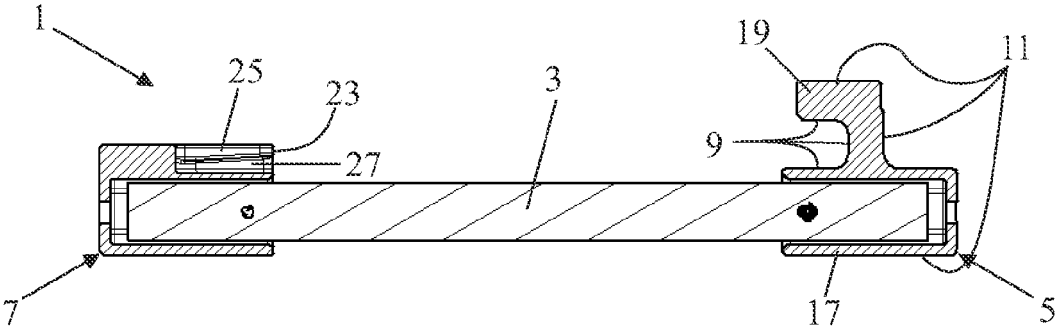

FIG. 4

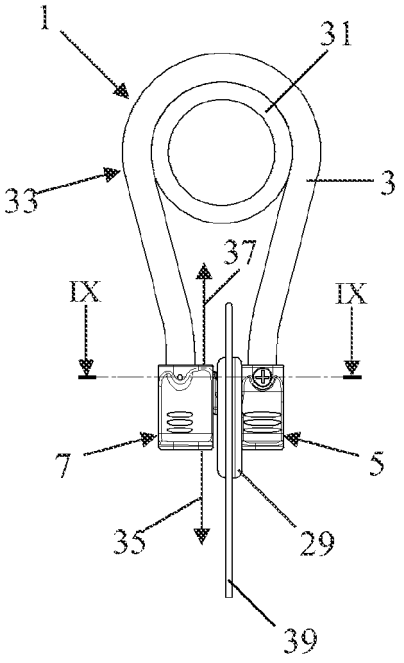

FIG. 5

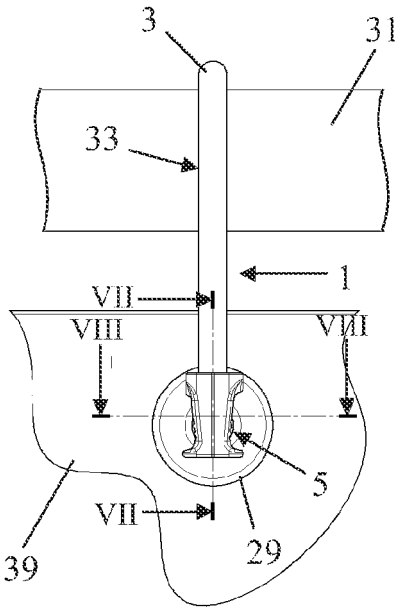

FIG. 6

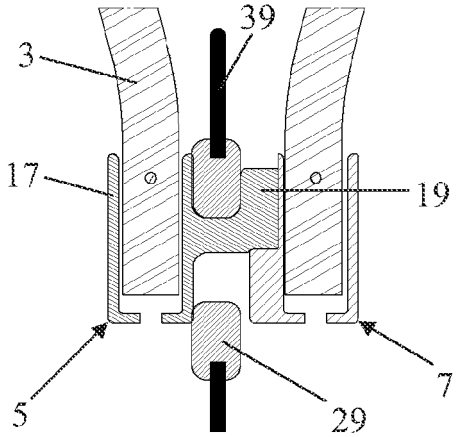

FIG. 7

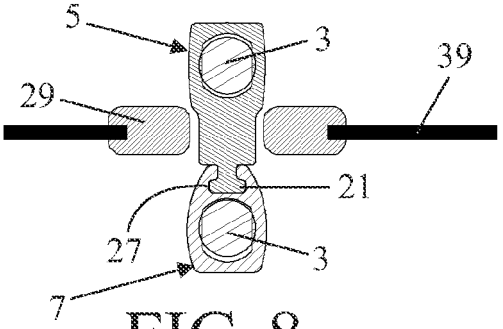

FIG. 8

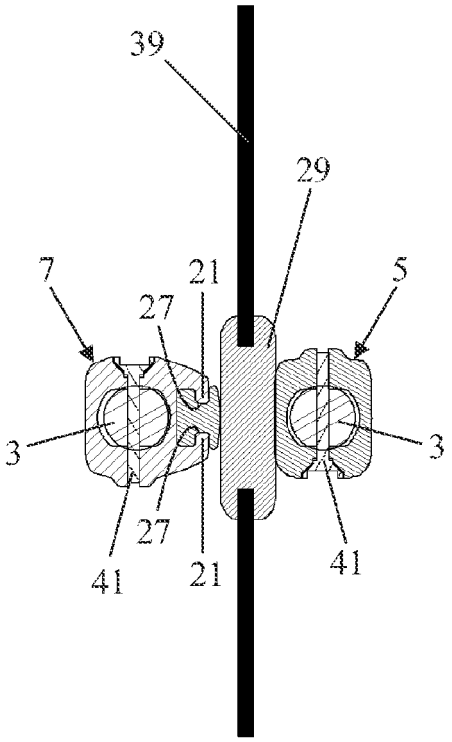

FIG. 9

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EUROPEAN SEARCH REPORT

Application Number
EP 10 15 6470

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			TECHNICAL FIELDS SEARCHED (IPC) G09F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	10 June 2010	Demoor, Kristoffel

CATEGORY OF CITED DOCUMENTS

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EPO FORM 1503 03.82 (P04C01)

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10-06-2010

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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