April 23, 1968 C. K. CHATTEN ETAL 3,379,162

POSITIONING DEVICE FOR CABLE FAIRING

Filed Nov. 16, 1966

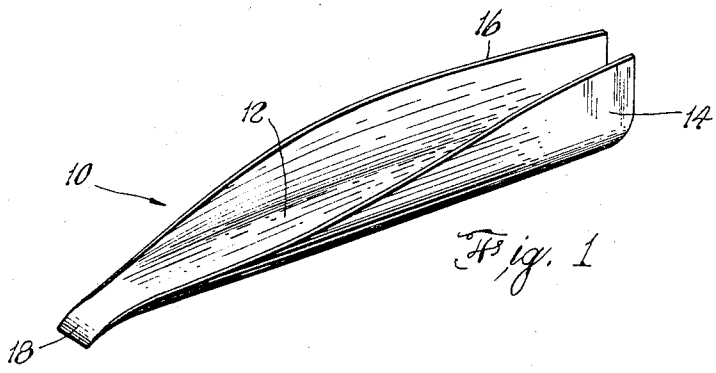


Fig. 1

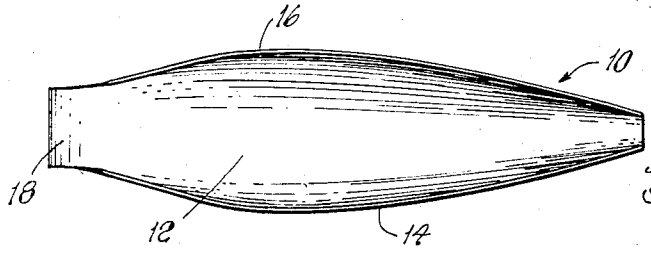


Fig. 2

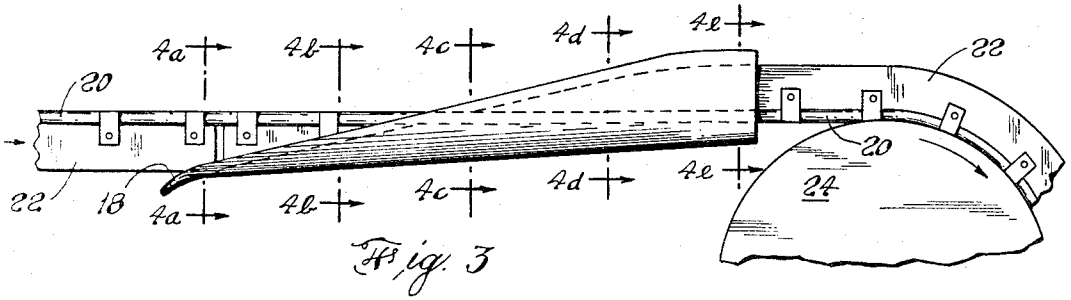


Fig. 3

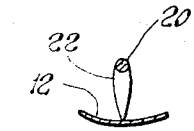


Fig. 4a

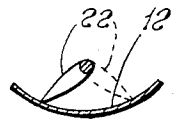


Fig. 4b

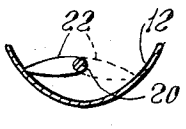


Fig. 4c

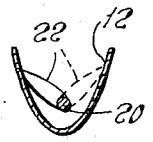


Fig. 4d

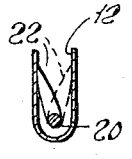


Fig. 4e

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POSITIONING DEVICE FOR CABLE FAIRING

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2 Claims. (Cl. 114—235)

ABSTRACT OF THE DISCLOSURE

This invention comprises a trough-like structure for passively rotating a cable fairing, or like object, 180° in attitude. The interior contour of the trough changes gradually from one end to the other and this change in contour forces the fairing, which is in sliding contact with the interior of the trough, to conformably change its orientation. The trough-like structure has a base, two sides extending upwardly from the base and a downwardly curving lip portion at one end of the base. Each side flares upwards from the lip end to a maximum height at the other end of the base. The cross-sectional view of the base and sides has a large radius of curvature at the lip end, the radius of curvature gradually becoming smaller toward the other end where the cross-section is substantially U-shaped.

The invention described herein may be manufactured and used by or for the Government of the United States of America for governmental purposes without the payment of any royalties thereon or therefor.

The invention relates to a passive device for changing the orientation of an elongated structure which is rotatably associated with a long rope or cable and especially to a device for properly positioning a rotatable fairing on a marine towing cable just prior to storing the cable and fairing on a storage drum.

Marine operations frequently involve the towing of a submerged object behind a moving ship. To reduce the drag force on the cable by which the submarged object, or "fish" is attached to the ship, the cable may be enclosed by a streamlined fairing. The fairing is usually sectional, in sections of up to twenty-five feet in length as measured along the cable, and can rotate around the cable so that it will be oriented properly by the drag force.

The rotational property of the fairing gives rise to a problem when the cable is reeled in and is wound around a storage drum on the ship. At this time, the fairing must extend outwardly from the center of the storage drum at all points along the circumference of the drum. However, as the cable comes out of the water, gravity pulls the fairing down so that it would extend inwardly toward the center of the drum if it were wound on the drum directly. The fairing must thus be rotated 180° before it can be wound on the drum for storage; otherwise, there is danger of severe damage to the fairing.

An object of the invention is to properly position, while the cable is being reeled in, a rotatable fairing on a marine towing cable for submerged bodies, so that the cable and fairing can be stored on a drum without damage to the fairing.

Another object is to prevent damage to the rotatable fairings on marine towing cables when they are being reeled in for storage.

Other objects and advantages will appear from the following description of an example of the invention, and the novel features will be particularly pointed out in the appended claims.

In the drawings:

FIG. 1 is a perspective view of an embodiment of the

invention as seen somewhat from above and from an angle between the front and the right side;

FIG. 2 is a top view of the embodiment shown in FIG. 1;

FIG. 3 is a side view of the embodiment shown in FIG. 1; and

FIGS. 4A–E are a series of cross-sectional views taken along various lines AA to EE through FIG. 3, showing how the changing contour acts to rotate the fairing.

An embodiment of the invention is shown in perspective view in FIG. 1. The positioning device **10** comprises a trough-like structure formed with a base **12**, a pair of flaring sides **14** and **16** and a lip portion **18** at the end of the base at which the sides have their minimum height. The device **10** may be fabricated from any suitable rigid and tough material such as aluminum or stainless steel, for example.

The top and side views of the structure shown in FIG. 1 are illustrated in FIG. 2 and FIG. 3 respectively. FIG. 3 also shows how the cable **20** and its fairing **22** feed into the positioning device **10** and onto a storage drum **24**. It may be noted that the fairing **22** hangs downward from the cable **20** as it enters the positioning device **10** and is rotated to an upward position as it leaves. The storage drum **24** is placed close to the positioning device **10** so that the fairing **22** cannot again rotate downward under the influence of gravity before being wound on the storage drum **24**.

FIGS. 4A–E are cross-sections taken at intervals along the length of the positioning device **10** and show how the changing contour of the base **12** gradually rotates the fairing **22** about the cable **20** as the fairing progresses through the positioning device. The decreasing radius of curvature of the base **12** and the narrowing of the width between the sides **14** and **16** forces the fairing **22** up until, in the final U-shaped cross-section (FIG. 4E), it stands in an upright position 180° from that in which it started.

The fairing **22** may be forced up along either side of the positioning device and this is indicated by the dashed-line fairing in FIGS. 4A–E.

It will be understood that various changes in the details, materials, and arrangements of parts (and steps), which have been herein described and illustrated in order to explain the nature of the invention, may be made by those skilled in the art within the principle and scope of the invention as expressed in the appended claims.

We claim:

1. A positioning device for a cable fairing or the like comprising:

a trough-like structure having a base, two sides extending upwardly from said base, and a lip portion, each said side flaring from a point at one end of said base to a maximum height at the other end,

said lip portion curving downward from that end of said base at which said sides are at their minimum height,

the cross-sectional view of said base and sides of said structure having a large radius of curvature at the lip end, said radius gradually becoming smaller toward the other end until the cross-section is substantially U-shaped at the end of the base at which the sides have their maximum height.

2. A device as set forth in claim **1**, said trough-like structure being fabricated from a rigid material.

References Cited

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