

PATENT SPECIFICATION

DRAWINGS ATTACHED

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COMPLETE SPECIFICATION

Device for Opening Trawl Nets

We, THE COLONIAL TREASURER INCORPORATED, a Body Corporate incorporated in the Colony of Hong Kong under the Colonial Treasurer Incorporation Ordinance of Hong Kong and having its principal place of business at Hong Kong, do hereby declare the invention, for which we pray that a Patent may be granted to us and the method by which it is to be performed, to be particularly described in and by the following statement:—

The invention relates to a device for use in opening trawl nets and provides an alternative to or improvements in, the commonly used otter boards or doors.

The invention provides a trawl net opening device comprising a buoyant fin to be upright in use, and two rollers hanging below the fin on chains, cables or like tension members offering little or no resistance to compressive force, the two rollers being one behind the other in the direction along the fin and capable of rolling along the sea bed when trawling, the roller axes being held spaced apart by a rigid spacer, the device as a whole having negative buoyancy.

It is preferred that one of the rollers is near the front of the fin. The front roller may be heavier than the second roller, e.g. twice as heavy. The arrangement may be that, in normal operation, the second roller is at a level above that of the first roller and is held off the bed. Preferably the two rollers are attached to the rigid spacer bar by universal joints.

The buoyancy of the fin may be provided, wholly or partly, by a buoyancy member or float attached thereto or built as an integral part thereof and the resultant negative buoyancy may be due solely to the weight of the rollers and their attachment means or addi-

tional weight may be provided, preferably on the attachment means.

The device may be provided with stabilising vanes in horizontal and/or vertical planes and preferably at the rear of the buoyancy member.

The buoyancy member may be of cylindrical form with its axis extending fore and aft in a generally horizontal plane and it may carry links for towing chains or cables. Preferably the said axis lies in the plane of the fin and at the centre of the depth of the fin.

A specific embodiment of the invention will now be described by way of example and with reference to the accompanying drawings, in which:—

Figure 1 is an elevation of the device,

Figure 2 is an end view of the device,

Figure 3 is a plan view of the device,

Figure 4 is a plan view of the device showing the various connections thereto,

Figure 5 shows the use of the device for bottom trawling,

Figure 6 shows the use of the device for mid-water trawling, and

Figure 7 is plan showing the device in use.

Referring first to Figures 1—3, the device comprises a combined fin 10 and buoyancy cylinder 11, the cylinder having conical ends 12, 13. The fin and cylinder are constructed of two metal sheets secured together and to bulkheads as later described. At the rear end the cylinder has four iron stabilising vanes 15 at 90° spacings. The outer ends of these fins are supported and protected by a ring 16.

Hanging from the fin there are two chains 18, 19 carrying heavy rollers 20, 21 held apart by a rigid spacer bar 22. The front roller 20 hangs below the roller 21 and has about twice the weight thereof. The rollers are carried

in brackets freely pivoted to the bar 22 preferably for universal pivotal movement. In normal use for bottom trawling only the roller 20 contacts the sea bed.

- 5 The fin is stiffened by an iron or steel rim 24 and straps 25, the latter carrying cable-attachment brackets and links 26 as well as the attachment links 27 for the chains 18,19. The links and brackets 26 are duplicated at
10 each side of the fin so that the device is suitable for port or starboard use. The two front links 26 at either side are for attachment of a chain towing pennant and the rear links or brackets are for attachment of the
15 net gear. The link 26a is for lifting purposes. The device may, in use, operate at an angle of attach of about 50° as indicated in the drawings.

- 20 The buoyancy cylinder is filled with expanded polyurethane rigid foam divided by stiffening bulkheads 28, and two longitudinal stiffeners 29,30.

- 25 The devices are used in pairs as seen in Figures 5 to 7 and it is to be noted that when bottom trawling the rollers 20 run on the bottom and that when mid-water trawling the devices are raised from the bottom. The depth of trawl can be determined and ascertained by the length of warp paid out and the
30 angle of the warp to the horizontal.

- In the specific device forming the subject of this particular example the area of the fin (including the projected area of the buoy-
35 ancy chamber) is 15 sq.ft., the fin and buoyancy cylinder together have a positive buoyancy (in sea water) of 43 lbs. and the rollers together with their suspension means have a negative buoyancy of 169 lbs. Thus the nett negative buoyancy was 126 lbs. but
40 the device stays upright in the water and the static load on the sea bed is only 126 lbs.

- 45 Among the advantages of the invention are that it resists capsizing, it rides relatively easily over varying sea bed contours, and it is less likely than known other boards to damage underwater cables or to sink into soft muddy sea beds.

WHAT WE CLAIM IS: —

- 50 1. A trawl net opening device comprising a buoyant fin to be upright in use, and two rollers hanging below the fin on chains,

cables or like tension members offering little or no resistance to compressive force, the two rollers being one behind the other in the direction along the fin and capable of rolling
55 along the sea bed when trawling, the roller axes being held spaced apart by a rigid spacer, the device as a whole having negative buoyancy.

2. A net opening device as claimed in claim 1 in which one of the rollers is near the front of the fin.

3. A net opening device as claimed in claim 1 or claim 2 in which the first, front, roller is heavier than the second roller.

4. A net opening device as claimed in any one of the preceding claims in which, in normal operation, the second roller is at a level above that of the first and held off the bed.

5. A net opening device as claimed in any one of the preceding claims in which the rollers are connected to the spacer by universal joints.

6. A net opening device as claimed in any one of the preceding claims in which the buoyancy of the fin is provided, at least in part, by a buoyancy member.

7. A net opening device as claimed in any one of the preceding claims and having a laterally projecting stabilising vane or vanes.

8. A net opening device as claimed in claim 7 in which the stabilising vane or vanes is, or are, behind the rollers.

9. A net opening device as claimed in any one of the preceding claims and having an upright stabilising vane or vanes behind the fin.

10. A net opening device as claimed in any one of the preceding claims having at one side of the fin two attachments for towing chains or cables one behind the other.

11. A net opening device as claimed in claim 10 and also having brackets behind the towing attachments, for net attachment devices.

12. A net opening device substantially as herein described with reference to, and as shown in, the accompanying drawings.

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