Title: WELDED STOCKLESS ANCHOR

Abstract: The invention relates to an anchor (1) comprising a housing (2) with a base (3) and a stop plate (4) extending obliquely from at least an end thereof, a shank (5) which is bearing-mounted at one end to the housing and which comprises on its opposite end fastening means (6) for an anchor line or chain, and on either side of the housing a fluke (7) which comprises an insertion end (10) on its end remote from the base (3), wherein the angle between the stop plate (4) and the base (3) by a connecting line between the insertion end (10) and an end of the stop plate (4) connected to the base (3).
For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.
WELDED STOCKLESS ANCHOR

The invention relates to a welded stockless anchor such as is used in a variety of sizes for boats and ships. Welded stockless anchors are for instance known in different embodiments under the trade name POOL. POOL is a registered mark of Ship's Equipment Centre Groningen B.V. which is used for the purpose of trading anchors with specific properties. The mark as such is widely known among interested parties.

Prior art welded stockless anchors comprise a housing with a base and a stop plate extending obliquely from at least an end thereof, a shank which is bearing-mounted at one end to the housing and which comprises on its opposite end fastening means for an anchor line or chain, and on either side of the housing a fluke which comprises an insertion end on its end remote from the base.

When the anchor is raised and not in use it lies with the stop plate against the shell of the ship. The anchor line or chain is herein pulled taut so that the shank is fixed in an anchor hawse hole or the insertion ends of the fluke are pulled tight in a receiving space for the anchor arranged for this purpose on the ship.

For anchoring purposes the anchor is payed out such that it comes to rest on the bottom and is dragged over the bottom until the insertion ends protrude into the bottom and the anchor finds a hold.

In known anchors of the present type the anchor must sometimes be dragged a considerable distance along the bottom before the insertion ends find sufficient grip to allow the flukes to dig in.

The invention therefore has for its object to improve an anchor of the present type such that this drawback is obviated.
This object is achieved in an anchor according to the invention in that the angle between the stop plate and the base is smaller than the angle made with the base by a connecting line between the insertion end and an end of the stop plate connected to the base. This ensures that when the anchor lies flat on the bottom at least one of the insertion ends makes contact with the bottom. The insertion end will hereby quickly dig into the bottom and the anchor will get a hold almost immediately.

The measure of claim 2 is preferably applied. It then makes no difference with which side the anchor comes to lie on the bottom.

The measure of claim 3 achieves that the angle of the flukes relative to the shank is bounded in that the shank lies in the end position against the stop plate. The angle at which the fluke digs into the bottom can hereby be optimized.

A further favourable development is characterized by the measure of claim 4. The stop plate can hereby absorb great forces from the shank without damage or wear occurring. This has a favourable effect on the lifespan of the anchor according to the invention.

A further improvement in the distribution of forces during the transmission of forces from the shank to the housing is achieved in advantageous manner with the measure according to claim 5.

A suitable embodiment of the anchor according to the invention is characterized in claim 6.

Because with the measure according to the invention the insertion ends of the flukes grip readily into the bottom and the anchor thus digs in quickly, while at the same time the angle at which the fluke penetrates the bottom is bounded in reliable manner for a long lifespan, the anchor according to the invention can be
embodied in suitable manner as a type wherein the centre of gravity of the housing with the parts fixedly connected thereto, such as the flukes, lies between the bearing-mounting of the shank on the housing and the base. Although the rotation point thus lies relatively further forward when the anchor is dragged along the bottom, a good operation of the anchor is nevertheless achieved, while the advantage is realized that the anchor can always be raised in the correct position against the ship's side.

In known welded stockless anchors the flukes are placed against the side plates of the housing and connected fixedly to the housing by means of welded connections. During transmission of forces from the flukes to the housing there occur in a number of such anchors local stresses which are higher than the yield stress, whereby the anchor can be damaged. With the measure according to claim 10 an improvement in the distribution of force is achieved in favourable manner, wherein local stresses above the yield point of the material are avoided.

A further improvement in the distribution of forces during transmission of forces from the flukes to the housing is achieved in favourable manner with the measures according to claims 11 and 12.

The invention will be further elucidated in the following description with reference to the accompanying figures.

**Figure 1** is a perspective view of an anchor according to a preferred embodiment of the invention.

**Figure 2** is a side view of the anchor of figure 1 while it is lying on the bottom of a body of water.
Figure 3 is a longitudinal section of the anchor of figure 1 wherein the flukes are dug in and the anchor is on the point of being raised.

Figure 4a is a perspective view of an anchor according to an alternative preferred embodiment of the invention.

Figure 4b is a perspective view with exploded parts of the anchor of figure 4a.

The anchor 1 shown in figure 1 has a housing 2 with a base 3 which is situated on the underside in the shown standing position. Extending obliquely upward from base 3 are two stop plates 4 with which the anchor can lie against the shell of the ship when the anchor is raised.

In this exemplary embodiment the two stop plates are connected on either side to side plates 11 on which a shank 5 of anchor 1 is bearing-mounted.

Shank 5 can pivot relative to the housing between the one end position shown in figure 1 and another opposite end position.

On either side of housing 2 a fluke 7 is arranged, in particular by welding. Situated on the lower end of each fluke is a crown plate 8 which contributes toward tilting of the anchor when it is dragged along the bottom and which also prevents the anchor digging too deeply into the bottom.

On the opposite end each fluke has an insertion end 10 which, as figure 2 shows clearly, is intended to grip into the bottom and thus ensure the desired hold.

When the anchor is lowered, it will come to lie on the bottom in the manner shown in figure 2. As figure 2 shows clearly, the angle between stop plate 4 and base 3 in the exemplary embodiment of the anchor according to the invention shown here is smaller than the angle which a connecting line, shown here as a bottom 12, between
insertion end 10 and an end of stop plate 4 connected to the base, makes with the base 3. The stop plate 4 itself hereby remains clear of the bottom 12 and insertion end 10 comes to rest on the bottom. It can be readily appreciated that, when anchor 1 is dragged along the bottom 12 by a pulling force exerted by the anchor line or chain on joining link 6 on the free end of shank 5, insertion end 10 penetrates rapidly into the bottom 12 and anchor 1 therefore immediately gets a hold. The stop plate does not impede penetration of flukes 7 into the bottom 12.

As the section of figure 3 shows, shank 5 is provided, at the end with which it is mounted in housing 2 by means of bearing 9, with inclining stop surfaces 15 which, in the final position of shank 5 relative to housing 2 shown in figure 3, lie in turns against the inner side of stop plate 4.

In the exemplary embodiment drawn here the shank and the stop plates are dimensioned such that, while one of the stop plates of 15 is in contact with the inner surface of stop plate 4, here the lower stop plate 4, the side of shank 5 is also in contact at 16 with the upper edge of the opposite stop plate 4. A good distribution and transmission to stop plates 4 of the forces exerted on shank 5 via the joining link is hereby achieved. This is particularly important when the anchor is being pulled out as shown in figure 3, certainly when the bottom is a hard one. The force exerted by the end of shank 5 on stop plates 4 can be very great, but in the embodiment of the invention shown here the forces on the construction remained limited such that no deformation can occur.

Figures 4a and 4b show and embodiment of the anchor according to the invention with measures for an improved transmission of forces between fluke 7 and side plate
11. Side plate 11 is formed from two side plate parts 11a and 11b. Both side plate parts 11a and 11b are designed such that both parts together form a side plate 11 which has two recesses 12a and 12b. In the assembled state 14 the protruding portions 13a and 13b of fluke 7 protrude into recesses 12a and 12b of side plate 11.

Figures 4a and 4b also show that upper edge 15 of fluke 7 is coupled to side plate 11 by means of coupling plate 16.

It is noted that the anchor according to the invention can be embodied in many different ways. The stop plates, which are arranged in the drawing between the side plates, can for instance also be arranged on the sides. The side plate which in figure 4b is formed from two parts can further be formed integrally. The anchor according to the invention can also be embodied in many different dimensions. The anchor according to the invention can be applied in suitable manner both for small pleasure craft and for large commercial vessels.
CLAIMS

1. Anchor comprising a housing with a base and a stop plate extending obliquely from at least an end thereof, a shank which is bearing-mounted at one end to the housing and which comprises on its opposite end fastening means for an anchor line or chain, and on either side of the housing a fluke which comprises an insertion end on its end remote from the base, characterized in that the angle between the stop plate and the base is smaller than the angle made with the base by a connecting line between the insertion end and an end of the stop plate connected to the base.

2. Anchor as claimed in claim 1, wherein the housing comprises two stop plates arranged mirror-symmetrically relative to a central perpendicular plane of the base.

3. Anchor as claimed in claim 2, wherein the shank is bearing-mounted between the stop plates substantially in the central perpendicular plane and is pivotable between two end positions in which the shank lies against at least one stop plate.

4. Anchor as claimed in claim 3, wherein the shank is provided at its bearing-mounted end with at least one inclining stop surface which in an end position is in surface contact with the inner surface of the opposite stop plate.

5. Anchor as claimed in claim 4, which is dimensioned such that in the end position the shank also lies against an edge of the other stop plate.

6. Anchor as claimed in claim 4 or 5, which is embodied substantially mirror-symmetrically relative to the central perpendicular plane of the base.

7. Anchor as claimed in any of the foregoing claims, of the type wherein the centre of gravity of the housing with the parts connected fixedly thereto lies between
the bearing-mOUNTING OF The Shank ON the Housing and the Base.

8. Anchor as claimed in any of the foregoing claims, wherein at least the base, the stop plate and the flukes are mutually connected by means of a welded joint.

9. Anchor as claimed in any of the foregoing claims, wherein a crown plate is arranged on either side of the housing.

10. Anchor as claimed in any of the foregoing claims, wherein the flukes protrude into recesses arranged in side plates of the housing.

11. Anchor as claimed in any of the foregoing claims, wherein at least one of the flukes comprises an upper edge which is coupled to a or the side plate of the housing.

12. Anchor as claimed in claim 11, wherein the upper edge is coupled to the side plate by means of a coupling plate which is fixedly connected to the upper edge and the side plate.
### INTERNATIONAL SEARCH REPORT

**International application No.**
PCT/NL2006/000303

**A. CLASSIFICATION OF SUBJECT MATTER**

**INV. B63B21/44**

According to international Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

B63B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

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Further documents are listed in the continuation of Box C.

See patent family annex.

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Vermeulen, Tom
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