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(71) Applicant: **Fundação Noras**
2565-781 Turcifal (PT)

(72) Inventor: **FERREIRA NORAS, Jorge Alberto**
2560-346 Torres Vedras (PT)

(74) Representative: **do Nascimento Gomes, Rui**
J. Pereira da Cruz, S.A.
Rua Victor Cordon, 10-A
1249-103 Lisboa (PT)

(54) **A MODULE AND SYSTEM FOR THE ENHANCED RECOVERY FROM A STUCK ANCHOR**

(57) The present disclosure falls within the area of nautical accessories, in particular accessories for retrieving anchors when they become stuck during anchoring. When, during anchoring, the anchor of a vessel gets stuck in some external element, such as rocks that may have moved and blocked the free action of the anchor, it is difficult to remove it, which in many cases leads to the vessel's owner being forced to cut the chain, only then being able to release the vessel. The described module (10) and system (100) ensure improved and efficient retrieval, by making it possible - with a single module (10) and under a mechanical action - to release a first connecting element (11).

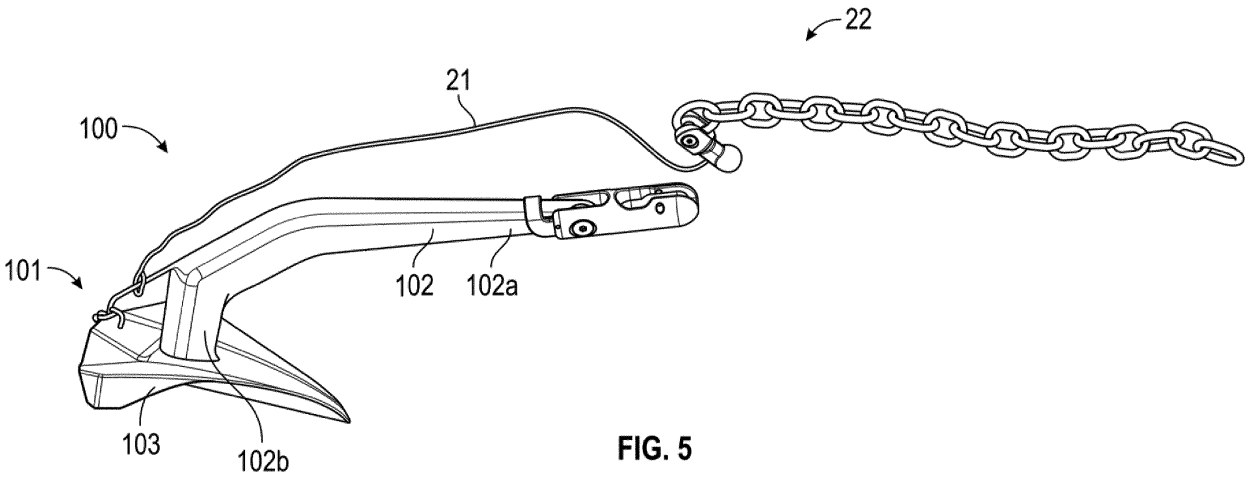

FIG. 5

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Description

TECHNICAL FIELD

[0001] The present disclosure falls within the area of nautical accessories, in particular accessories for anchor retrieval when they get stuck during anchoring.

BACKGROUND

[0002] When, during anchoring, the anchor of a vessel gets stuck on some external element, such as rocks that may have moved and blocked the free action of the anchor, it is difficult to remove it, which in many situations leads to the vessel's owner being forced to cut the chain, only then being able to release the vessel.

[0003] The present disclosure finds its closer background in solutions that seek to address this problem, typically seeking to confer some freedom of movement to the anchor in relation to a chain to which it is directly or indirectly coupled, especially considering that the chain is the element that (directly or indirectly, typically directly) connects a vessel to the anchor.

[0004] An example of this is the Turkish patent application TR 2007 06837.

[0005] This solution allows the anchor to rotate around a point of connection to the chain, and in a plane perpendicular to the anchor shank and the chain (assuming that the latter is taut).

[0006] This gives an additional degree of freedom of movement to the anchor.

[0007] On the other hand, it is not easily controllable, which means that the anchor might keep this movement and require complex movement of the vessel in order to allow for a possible release and consequent releasing of the anchor.

[0008] Another particularly distinct example is the "Ultra Anchor Ring" solution.

[0009] This solution comprises a metal ring connected to a second chain. The ring is susceptible of being opened so that, in a situation where the anchor is stuck, it can be placed around the chain attached to the anchor.

[0010] The second chain is then unwound and the ring follows the anchor chain until it reaches the anchor itself and, expectedly, surrounds the anchor shank, which is located on the extension of the anchor chain.

[0011] At that point, the boat must move to a forward position, such that when the second chain is pulled, it is in a transverse direction to the anchor shank, thus pulling the anchor arms away from the rock or other environmental elements that might be holding it.

[0012] This solution is dependent on the successful accomplishment of several steps, in addition to requiring an additional and external element to the anchor, the ring.

[0013] The present disclosure presents an improved solution comparatively to the prior art.

SUMMARY OF THE DISCLOSURE

[0014] It is an object of the present disclosure a module for improved retrieval of a stuck anchor. The anchor has a shank comprising a first and a second end, the first end being opposite the second end, and at least one arm connected to the second end of the shank. The module may comprise:

a first connecting element comprising means for coupling to an external element such as a chain,
a second connecting element comprising coupling means for attachment to the anchor shank at the first end or at a point substantially proximate to the first end,

the first connecting element and the second connecting element being coupled to each other, and,
the module being configured so that, under mechanical action, the first connecting element and the second connecting element are released from their coupling, thereby separating the first end of the anchor shank from the external element when an anchor and an external element are coupled to the module.

[0015] The described module thus ensures improved and efficient retrieval, by making it possible with a single device and by performing a mechanical action, to release the first connecting element from the second connecting element and thus allowing a vessel attached to the anchor to be freed. An external element such as a chain, attachable to the module - in particular to the means for coupling to an external element

- enables the mechanical action separating the two connecting elements to be performed from the vessel.

[0016] It is also object of the present disclosure a system for improved retrieval of an anchor.

[0017] A vessel, such as a boat, comprising the aforementioned system is also an object of the present disclosure.

[0018] It is further an object of the present disclosure a method for improved retrieval of an anchor.

DESCRIPTION OF THE FIGURES

[0019]

Figure 1 - Schematic representation of a module (10) of the present disclosure, wherein the module (10) comprises a first connecting element (11) and a second connecting element (12). The first connecting element (11) is linked to the second connecting element (12) by a rail formed in the second connecting element (12) and a thickening formed in the first connecting element (11). The thickening is movable in

the rail, but is fixedly connected by means of a fuse (16) inserted in two attachment points formed in the second connecting element (12). The first connecting element (11) comprises means for coupling to an external element (13) such as a chain, consisting of a screw or pin formed in the first element. The second connecting element (12) comprises means for coupling to the shank (14) of the anchor, which are suitable for coupling to a first end (102a) or at a point substantially proximate to the first end (102a) of the shank, said means also comprising a screw or pin formed in the first element. The second connecting element (12) is thus hingedly connectible to the shank, such that, when connected to the first end (102a) of the shank, it is capable of rotating relative to the shank in a plane parallel to the shank and between a point at which it is aligned or substantially aligned with the shank and a point at which it is disposed transversely relative to the shank. The extension of the module (15) causes the latter to not rotate beyond the point where it is aligned or substantially aligned with the shank.

Figure 2 - Schematic representation of a system (100) which, in addition to a module (10) as shown in figure 1, additionally comprises an anchor (101), a main chain (22) and a flexible cable (21). The main chain (22) is coupled to the coupling means to an external element (13) of the first connecting element (11), thus enabling a connection of the module (10) and the anchor (101) to a vessel. The anchor (101) comprises a shank (102) and an arm (103), said shank (102) having two ends: a first end (102a) with an opening (17) for coupling to the module (10) and a second end (102b) connecting to the arm (103). The anchor (101) is hingedly connected to the coupling means to the shank (14) of the anchor (101). The means for coupling to the shank (14) of the anchor (101) are coupled to the first end (102a). The system (100) further comprises a flexible cable (21) which is coupled to the first connecting element (11) and to the second end (102b) of the shank (102) or to a point substantially close to the second end (102b) of the shank (102). The anchor (101) comprises an extension between the second end (102b) of the shank (102) and the arm (103). The cable encircles and is movable along the extension.

Figure 3 - schematic representation of the system (100) of figure 2, in which a mechanical action is being performed on the first connecting element (11) in a direction substantially along the shank (102) and in a direction of the coupling means to the shank (14). This action thus leads to the first connecting element (11) rotating in the direction of the second connecting element (12), which will cause the fuse (16) to be broken, as shown in the following figure. The mechanical action is performed by a pull through the main chain (22).

Figure 4 - schematic representation of the system (100) of figures 2 and 3, in which the mechanical action started in figure 3 continues to be performed on the first connecting element (11), in a direction substantially along the shank (102) and in a direction of the coupling means to the shank (14). This action thus caused breaking of the fuse (16), with the fixed connection between the first connecting element (11) and the second connecting element (12) being broken. The movement of the thickening of the first connecting element (11) along the rail of the second connecting element (12) and up to the opening (17) is thus free.

Figure 5 - schematic representation of the system (100) of Figures 2-4, wherein the mechanical action started in Figure 3 continues to be performed in the first connecting element (11) in a direction substantially along the shank (102) and in a direction of the coupling means to the shank (14). This action led to the breaking of the fuse (16) shown in the previous figure, the movement of the thickening of the first connecting element (11) having continued along the rail of the second connecting element (12) and passed through the opening (17). The first connecting element (11) is thus separated from the second connecting element (12), being freed from its coupling. A connection remains between the first connecting element (11) and the second end (102b) of the anchor (101) - in particular the associated extension - which allows a continued mechanical action, namely via the main chain (22), to pass from the first end (102a) of the shank (102) to the second end (102b) of the shank (102). This makes it possible for the anchor (101) to be pulled by a distinct point proximate or at the second end (102b), thereby releasing the anchor (101).

DETAILED DESCRIPTION

[0020] Additional elements of a module (10) for improved retrieval of a stuck anchor (101) are described below.

[0021] The anchor (101) may comprise an anchor body (101), which may comprise a shank (102), which may or may not have a balancing band. The shank (102) has a first end (102a) and a second end (102b), the first end (102a) being opposite the second end (102b). The anchor body (101) also comprises at least one arm (103). The arm (103) is connected to the second end (102b) of the shank (102), so one can also say that the second end (102b) is in a lower section of the anchor body (101) and the first end (102a) is in an upper section of the anchor body (101), considering a normal arrangement of the anchor (101) when in anchorage.

[0022] The module (10) may comprise various elements.

[0023] The module (10) may comprise a first connecting element (11), in its turn comprising means for coupling to an external element (13). The external element may

consist of a said main and flexible cable or chain, whereby the main and flexible cable or chain is attachable to the coupling means to an external element and thus to the anchor (101). This is achieved indirectly by means of the module (10).

[0024] The module (10) may comprise a second connecting element (12) comprising means for coupling to the shank (14) of the anchor (101), at the first end (102a) or at a point substantially proximate to the first end (102a).

[0025] The first connecting element (11) and the second connecting element (12) are separate elements. In addition, the first connecting element (11) and the second connecting element (12) are coupled to each other. The module (10) is configured such that, under mechanical action, the first connecting element (11) and the second connecting element (12) release from their coupling, thus separating the first end (102a) of the shank (102) of the anchor (101) from the external element, when an anchor (101) and an external element are coupled to the module (10).

[0026] This is a common situation, where an external element such as a main chain (22) of an anchor (101) is connected to an upper section of the shank (102).

[0027] If, during anchoring, the anchor (101) gets stuck, it is difficult to remove it when it is in this configuration, which often results in the owner of the vessel being forced to cut the chain.

[0028] When the mechanical action is performed, there is a release of the first connecting element (11) and, consequently, of the anchor (101).

[0029] The module (10) may additionally be configured to release the first from the second connecting element (12) when a mechanical action is performed on the first connecting element (11) in a direction substantially along the shank (102) and in a direction of the coupling means to the shank (14). This makes it possible that, when an external element such as a main chain (22) is pulled from the vessel in a position that - at least in part - allows a pull along said direction, the pull is made in the sense of promoting the release. Thus, the vessel may be positioned such that in relation to a stuck anchor (101) the action of pulling an external element such as a main chain (22) promotes the actuation of the module (10), with a consequent release of the connecting elements.

[0030] The module (10) may additionally be configured to keep the first connecting element (11) connected to the second connecting element (12) when a mechanical action is performed on the first connecting element (11) in a direction substantially along the shank (102) and in a direction opposite to the coupling means to the shank (14). This makes it possible that, when an external element such as a main chain (22) is pulled from the vessel in a position that - at least in part - allows a pull along said direction, the pull is made in the sense of preventing the release. Therefore, when the vessel is in a so-called normal position, for example when the anchor (101) is anchored beyond its bow, the pull performed by the main chain (22) promotes the maintenance of the connected state of the module (10), i.e. prevents the release of the first connecting element (11).

[0031] The second connecting element (12) can comprise a rail with an opening (17) and the first connecting element (11) can comprise a thickening which is inserted and movable in the rail.

[0032] When a mechanical action is performed in a direction substantially along the shank (102) and in a direction from the coupling means to the shank(14), the thickening element runs along the rail and passes through the opening (17), releasing the coupling point to an external element of the shank (102).

[0033] On the other hand, when a mechanical action is performed in a direction substantially along the shank (102) and in a direction from the second end (102b) towards the first end (102a), the thickening element runs through and remains in the rail, with the coupling point for an external element of the shank (102) remaining connected.

[0034] The second connecting element (12) may comprise attachment points for a fuse (16) breakable under mechanical action, the attachment points being such that, when a fuse (16) is positioned at the attachment points, the first connecting element (11) and the second connecting element (12) are fixedly connected to each other via the fuse (16). Such a solution adds a level of security to the release mechanism of the two connecting elements, such that it makes it possible to include a fuse (16) which only if broken will allow the release to occur.

[0035] The module (10) can additionally comprise a fuse (16) which is breakable under mechanical action, the fuse (16) being positioned at the attachment points in such a way that the first connecting element (11) and the second connecting element (12) are fixedly connected to each other by the fuse (16), and whereby, under mechanical action, the fuse (16) breaks and consequently the first connecting element (11) and the second connecting element (12) release from their coupling, thus separating the first end (102a) of the shank (102) of the anchor (101) from the external element, when an anchor (101) and an external element are coupled to the module (10).

[0036] The fuse (16) may consist of a plastic clamp or another element suitable for the said purpose.

[0037] The second connecting element (12) may be hingedly connected to the shank (102), such that, when connected to the first end (102a) of the shank (102), it is capable of rotating with respect to the shank (102) in a plane parallel to the shank (102) and between a point at which it is aligned or substantially aligned with the shank (102) and a point at which it is arranged transversely with respect to the shank (102), the point at which it is aligned or substantially aligned with the shank (102) being reached when a mechanical action is performed on the first connecting element (11) in a direction substantially along the shank (102) and in a direction of the coupling means to the shank (14). This promotes that a traction performed by an external element is better transmitted

to the connecting elements.

[0038] Additional elements of a system (100) for improved retrieval of a stuck anchor (101) are described below.

[0039] The system (100) comprises a module (10) according to the disclosure and a flexible cable (21).

[0040] The flexible cable (21) has an end fixedly attached to the first connecting element (11) and a length such that an opposite end is attachable to the second end (102b) of the shank (102) or at a point substantially close to the second end (102a), such that, when the end of the flexible cable (21) is fixed to the second end (102b) of the shank (102) and when the first connecting element (11) is released from the second connecting element (12), an external element connected to the first connecting element (11) remains connected to the anchor (101) via the flexible cable (21).

[0041] Said length is thus such that the flexible cable (21) extends substantially from the first end (102a) to the second end (102b).

[0042] The flexible cable (21) is thus arranged in such a way that it connects the first connecting element (11) to the second end (102b) of the shank (102), regardless of whether it is - or is not - connected to the second connecting element (12).

[0043] Thus, when the first connecting element (11) is released from the second connecting element (12) upon mechanical action, the external element is no longer connected to the first end (102a) of the shank (102) but remains connected to the second end (102b) of the shank (102) by means of the flexible cable (21).

[0044] As noted, it is a common situation that a stuck anchor (101) has to be left as such, freeing it from the vessel.

[0045] With the solution provided by the system (100), when the mechanical action is performed, the external element remains connected to the flexible cable (21) which is connected to the point substantially proximate to the second end (102b). Consequently, under mechanical action, the external element becomes connected - via the flexible cable (21) of the release mechanism - to the lower section of the anchor body (101), which enables a pulling action through an entirely separate region of the anchor (101), which is more amenable to retrieval.

[0046] The flexible cable (21) can consist of a chain or a flexible metal cable, optionally a stainless steel cable.

[0047] The system (100) may additionally comprise an anchor (101) having a shank (102) with a first and a second end (102b), the first end (102a) being opposite the second end (102b), and at least one arm (103) connected to the second end (102b) of the shank (102), wherein the coupling means to the shank (14) of the anchor (101) of the second connecting element (12) of the module (10) are coupled at a first end (102a) or at a point substantially proximate to the first end (102a) of the shank (102) of the anchor (101).

[0048] The system (100) may comprise a flexible main cable or chain, the flexible main cable or chain consisting of the external element and being thus coupled to the coupling means to an external element (13), and the mechanical action being transmissible to the first connecting element (11) via the flexible main cable or chain.

[0049] The system (100) may comprise means configured for winding and/or unwinding the main chain or cable, optionally a cable reel for anchor (101), the means configured for winding and/or unwinding being capable of performing the mechanical action.

[0050] The flexible cable (21) can encircle an extension between the shank (102) and the at least one arm (103), the flexible cable (21) being movable along said extension. This extension is thus substantially close to the second end (102b).

[0051] Additional elements of a method for improved retrieval of a stuck anchor (101) are described below.

[0052] The method may include, according to the system (100) of the present disclosure comprising an anchor (101),

performing a mechanical action that releases the first connecting element (11) from the second connecting element (12), and

pulling an external element attached to the coupling means to an external element (13), thereby consequently pulling the flexible cable (21) and thence pulling the anchor (101) through the second end (102b) or a point substantially proximate to the second end (102b) of the shank (102).

[0053] The method may additionally include the step of, for a system (100) with a module (10) comprising a fuse (16) and under a mechanical action, breaking the fuse (16) and thereby releasing the first connecting element (11) from the second connecting element (12).

[0054] The method may additionally comprise the step of moving a vessel attached to the anchor (101) by means of an external element such as a flexible main cable or chain to a position whereby pulling the main cable or chain causes a mechanical action to be performed on the first connecting element (11) in a direction substantially along the shank (102) and in a direction of the coupling means to the shank (14).

[0055] As will be evident to a person skilled in the art, the present invention should not be limited to the embodiments described herein, with a number of changes being possible, which remain within the scope of this invention.

[0056] Of course, the preferred embodiments above described are combinable in the different possible forms, the repetition of all such combinations being herein avoided.

Claims

1. A module (10) for improved retrieval of a stuck anchor (101), the anchor (101) having a shank (102) with a first end (102a) and a second end (102b), the

first end (102a) being opposite the second end (102b), and at least one arm (103) connected to the second end (102b) of the shank (102), the module (10) being **characterized in that** it comprises:

a first connecting element (11) comprising means for coupling to an external element (13) such as a chain,
a second connecting element (12) comprising coupling means to the shank (14) of the anchor (101), at the first end (102a) or at a point substantially proximate to the first end (102a),
the first connecting element (11) and the second connecting element (12) being coupled to each other, and
the module (10) being configured in such a way that, upon a mechanical action, the first connecting element (11) and the second connecting element (12) release from their coupling, thereby separating the first end (102a) of the shank (102) of the anchor (101) from the external element, when the anchor (101) and the external element are coupled to the module (10).

2. A module (10) according to the previous claim, wherein it is additionally configured to release the first from the second connecting element (12) when a mechanical action is performed on the first connecting element (11) in a direction substantially along the shank (102) and in a direction of the coupling means to the shank (14).

3. A module (10) according to the previous claim, wherein it is additionally configured to keep the first connecting element (11) connected to the second connecting element (12) when a mechanical action is performed on the first connecting element (11) in a direction substantially along the shank (102) and in a direction opposite to the coupling means to the shank (14).

4. A module (10) according to the previous claim, wherein the second connecting element (12) comprises a rail with an opening (17) and the first connecting element (11) comprises a thickening inserted and movable in the rail, wherein:

when a mechanical action is performed in a direction substantially along the shank (102) and in a direction of the coupling means to the shank (14), the thickening runs along the rail and passes through the opening (17), releasing the coupling point to an external element of the shank (102), and
when a mechanical action is performed in a direction substantially along the shank (102) and in a direction from the second end (102b) to the first end (102a), the thickening element runs along and remains in the rail, the coupling point for an external element of the shank (102) remaining connected.

5. A module (10) according to any one of the previous claims, wherein the second connecting element (12) comprises attachment points for a fuse (16) which is breakable under mechanical action, the attachment points being such that, when a fuse (16) is positioned at the attachment points, the first connecting element (11) and the second connecting element (12) are fixedly connected to each other via the fuse (16).

6. A module (10) according to any one of the previous claims, further comprising a fuse (16) breakable under mechanical action, the fuse (16) being positioned at the attachment points such that the first connecting element (11) and the second connecting element (12) being fixedly connected to each other through the fuse (16), wherein, under mechanical action, the fuse (16) breaks and, as a result, the first connecting element (11) and the second connecting element (12) release from their coupling, thus separating the first end (102a) of the shank (102) of the anchor (101) from the external element, when an anchor (101) and an external element are coupled to the module (10).

7. A module (10) according to any of the previous claims, wherein the second connecting element (12) is hingedly connectible to the shank (102) such that, when connected to the first end (102a) of the shank (102), it is capable of rotating relative to the shank (102) in a plane parallel to the shank (102) and between a point at which it is aligned or substantially aligned with the shank (102) and a point at which it is disposed transversely relative to the shank (102), the point at which it is aligned or substantially aligned with the shank (102) being reached when a mechanical action is performed on the first connecting element (11) in a direction substantially along the shank (102) and in a direction of the coupling means to the shank (14).

8. A system (100) for improved retrieval of a stuck anchor (101), **characterized in that** it comprises a module (10) according to any one of the preceding claims and a flexible cable (21), the flexible cable (21) having an end fixedly attached to the first connecting element (11) and a length such that an opposite end is attachable to the second end (102b) of the shank (102) or at a point substantially proximate to the second end (102a),
such that when the end of the flexible cable (21) is attached to the second end (102b) of the shank (102) and when the first connecting element (11) is released from the second connecting element (12), an

external element connected to the first connecting element (11) remains connected to the anchor (101) via the flexible cable (21).

9. A system (100) according to the previous claim, wherein the flexible cable (21) comprises a flexible metal cable or chain, optionally a stainless steel cable.

10. A system (100) according to any one of claims 8-9, wherein it further comprises an anchor (101) with a shank (102) having a first and a second end (102b), the first end (102a) being opposite the second end (102b), and at least one arm (103) connected to the second end (102b) of the shank (102),
wherein the coupling means to the shank (14) of the anchor (101) of the second connecting element (12) of the module (10) are coupled at a first end (102a) or at a point substantially proximate to the first end (102a) of the shank (102) of the anchor (101).

11. A system (100) according to any one of claims 8-10, wherein it comprises a flexible main cable or chain, the flexible main cable or chain consisting of the external element and being thus coupled to the coupling means to an external element (13), and the mechanical action being transmissible to the first connecting element (11) via the flexible main cable or chain.

12. A system (100) according to any one of claims 8-11, comprising means configured for winding and/or unwinding the main cable or chain, optionally a cable reel for anchor (101), the means configured for winding and/or unwinding being capable of performing the mechanical action.

13. A method for improved retrieval of a stuck anchor (101), **characterized in that,** in the system (100) of any one of claims 10-12,

a mechanical action is performed that releases the first connecting element (11) from the second connecting element (12), and
an external element coupled to the coupling means to an external element (13) is pulled, thereby consequently pulling the flexible cable (21) and thence pulling the anchor (101) through the second end (102b) or from a point substantially proximate to the second end (102b) of the shank (102) and, optionally, the module (10) of the system (100) being according to any one of claims 5-7, the method further comprising the step, under a performed mechanical action, of breaking the fuse (16) and thereby releasing the first connecting element (11) from the second connecting element (12).

14. A method according to the previous claim, wherein it further comprises the step of moving a vessel attached to the anchor (101) by means of an external element such as a flexible main cable or chain, or to a position wherein pulling the main cable or chain causes a mechanical action to be performed on the first connecting element (11) in a direction substantially along the shank (102) and in a direction of the coupling means to the shank (14).

15. A vessel, such as a boat, **characterized in that** it comprises the system (100) of any one of claims 8-12.

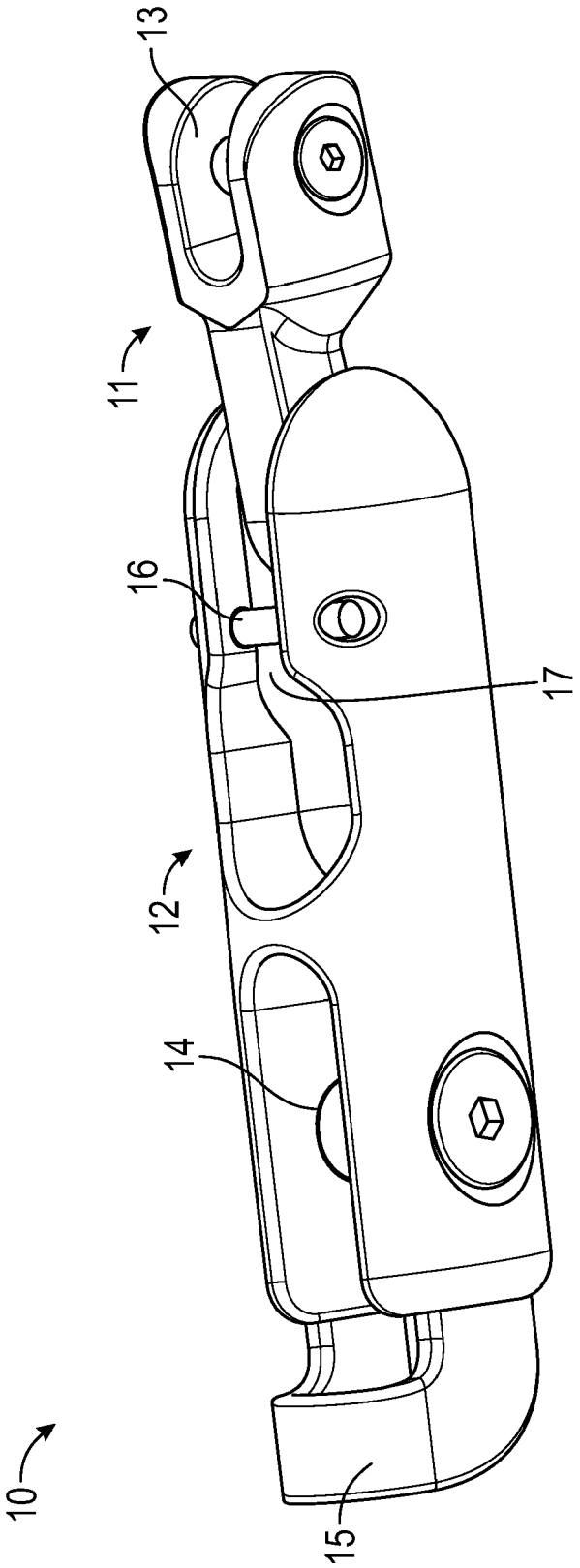

FIG. 1

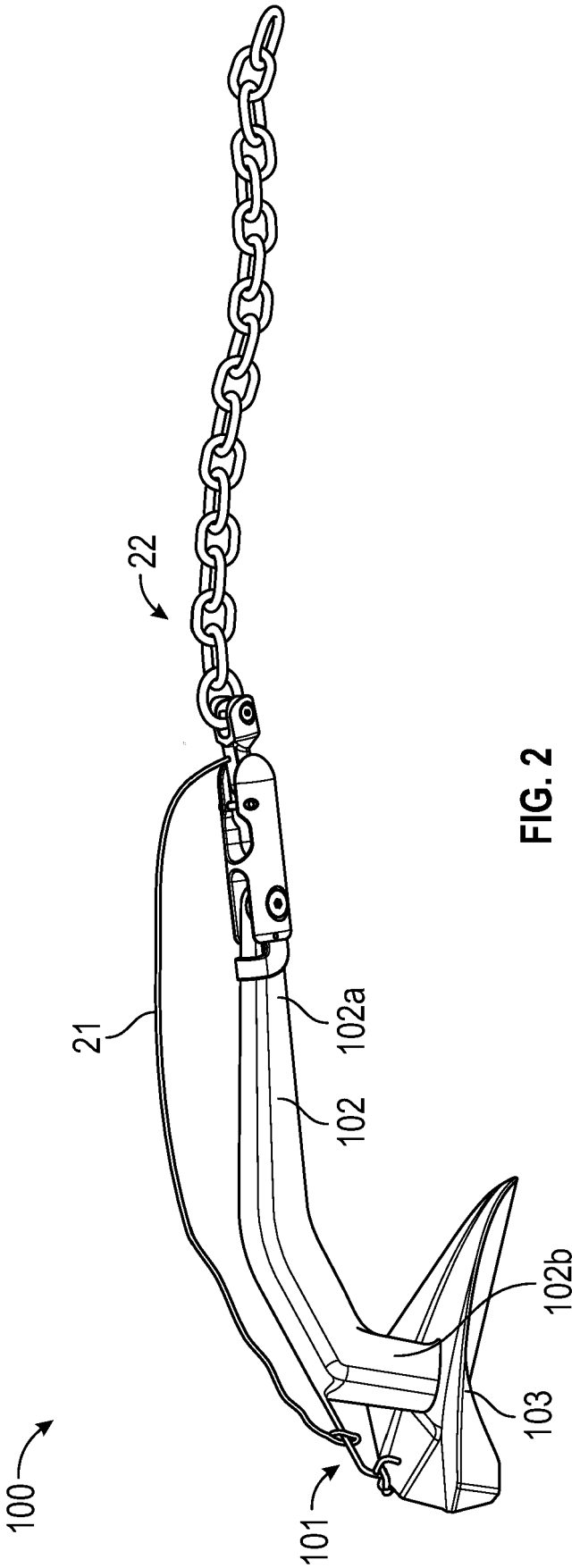

FIG. 2

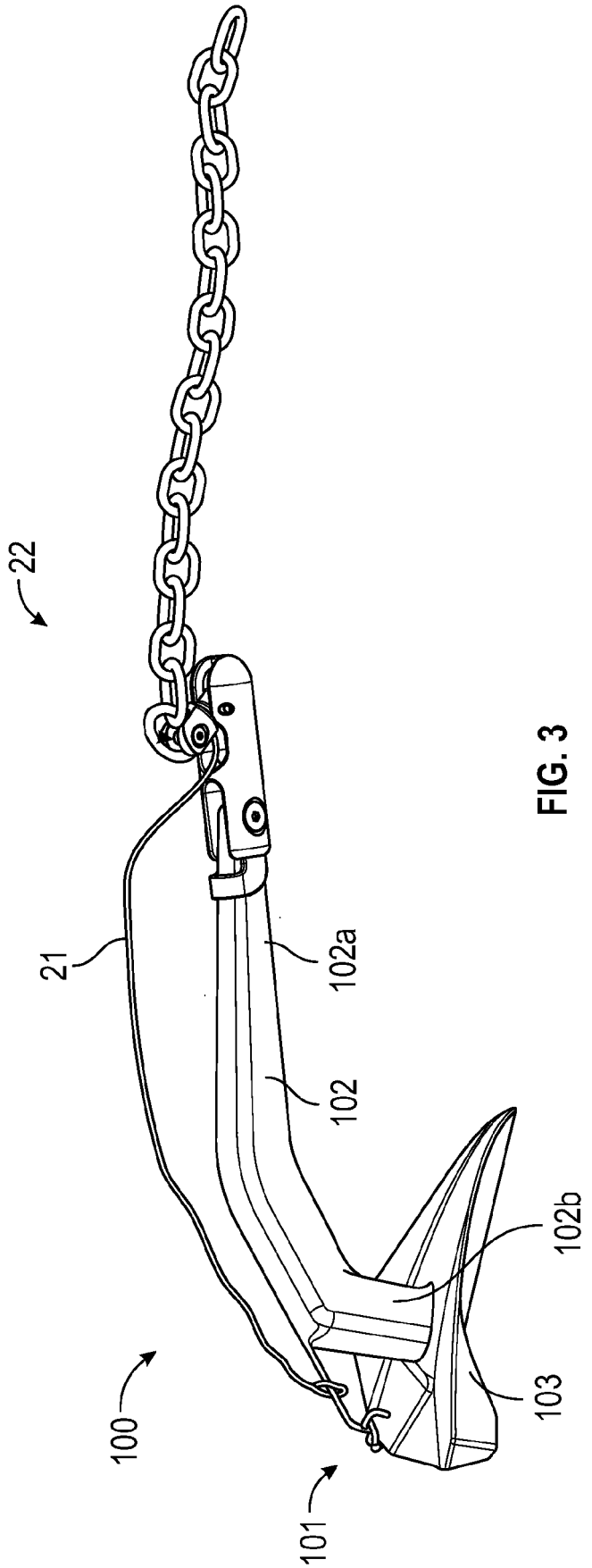

FIG. 3

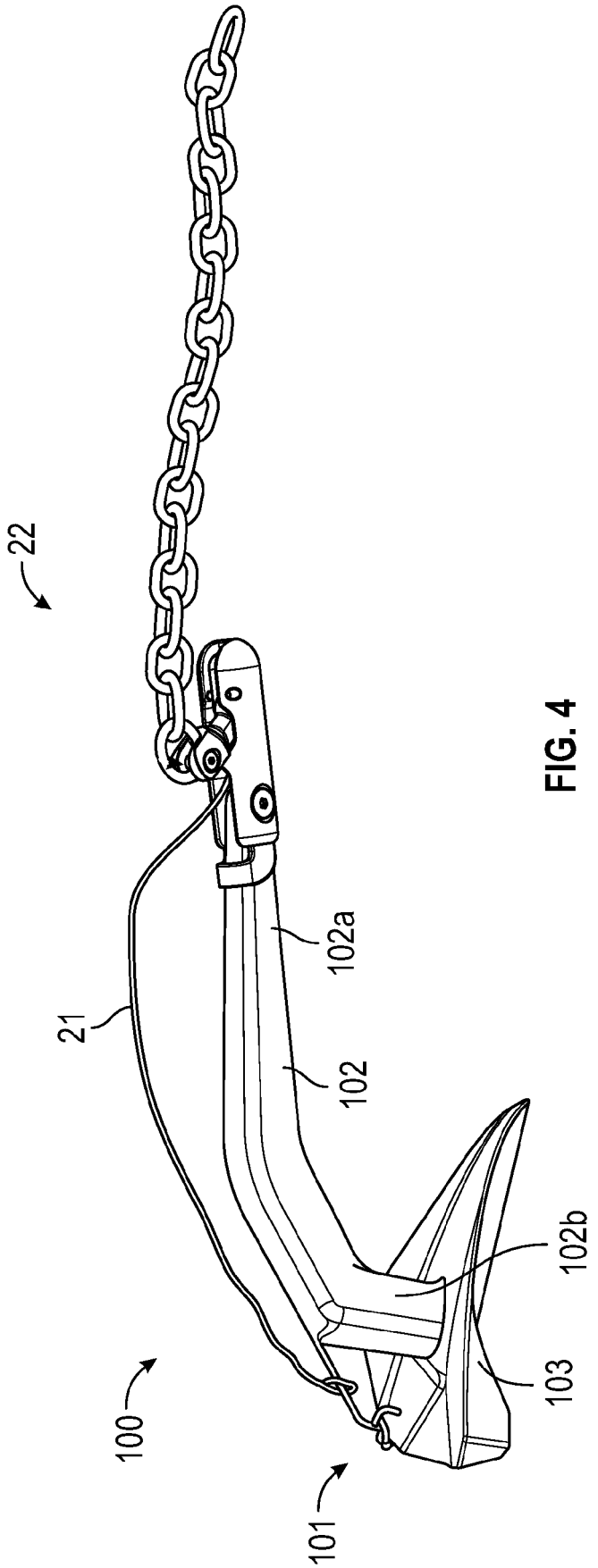

FIG. 4

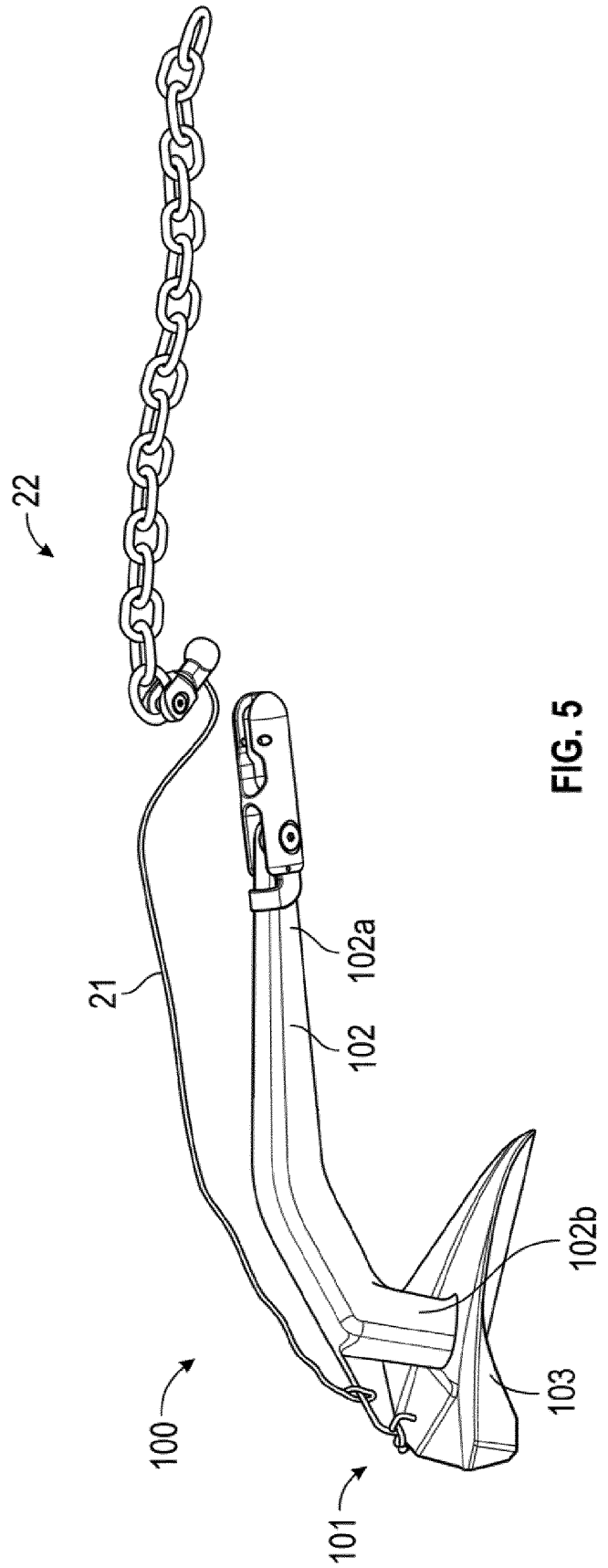

FIG. 5

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EUROPEAN SEARCH REPORT

Application Number
EP 21 21 1416

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X Y	JP S64 22697 U (UNKNOWN) 6 February 1989 (1989-02-06) * figures 1-2 * * page 5, lines 16-17 *	1,5-13, 15 2-4,14	INV. B63B21/32 B63B21/46
X	JP S53 145698 U (UNKNOWN) 16 November 1978 (1978-11-16) * figures 1-3 *	1-15	
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			TECHNICAL FIELDS SEARCHED (IPC)
			B63B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	19 May 2022	Freire Gomez, Jon

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19-05-2022

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REFERENCES CITED IN THE DESCRIPTION

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