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(54) **WINCH**

(57) A winch (100) comprising a support frame (1) having a seat (17); a drum (2) defining an axis of rotation; and actuation means, configured to actuate the rotation of said drum (2) about said axis of rotation. Said drum (2) is mounted in a removable manner in the seat (17) of said support frame (1). The frame (1) comprises a door (14) configured to adopt a closed position (C) and an open position (D), where in the closed position the door (14) closes the seat (17) and protects the drum (2) in the seat (17), while in the open position (D) it allows the drum (2) to be inserted or removed with respect to the seat (17) of the frame (1).

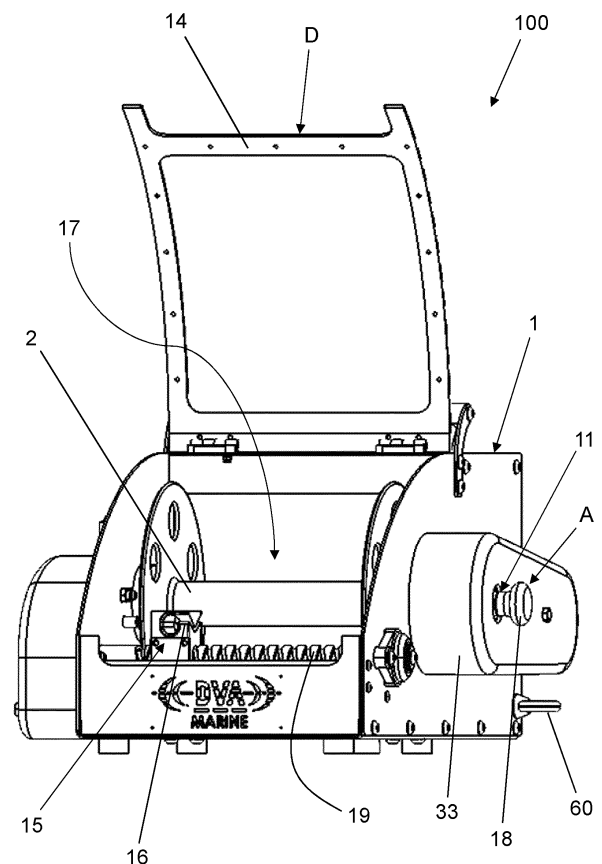


FIG. 1

Description

[0001] The present invention relates to the sector of machinery for handling weights by means of ropes or chains. In particular, the invention relates to a winch, preferably for use in the nautical field, that is to say on a boat.

[0002] The use of buoys is known during regattas, where they are arranged at a relative distance from each other and, precisely for use in regattas, are distributed over a large surface of water such as the sea or a lake, or even a river. Each buoy is connected to an anchor by a rope.

[0003] Usually, the recovery of buoys or anchors on board a boat is carried out manually or by means of a winch fixed to the boat itself. The winch is provided with a drum, that is to say a rotating cylinder, shaft or pin around which the rope of the buoy is wound. The cylinder, shaft or pin is referred to in the remainder of the invention as the drum.

[0004] In this case the rope is wound around the above-mentioned drum, by means of the spooling technique, to form a reel or spool. The coil is controlled manually or, more frequently, by an internal combustion engine or an electric motor.

[0005] Generally, the procedure provides for the hooking of the load, for example a buoy, and the consequent recovery through a rotation of the drum. Once the load has been recovered, the drum is rotated in the opposite direction to unwind and remove the cable from the drum, and allow the removal of a subsequent buoy. This operation must be repeated for all the buoys of the regatta to be recovered.

[0006] The use of such a winch, whilst on the one hand it is advantageous because it allows the effective recovery of loads that are in the water, such as the above-mentioned buoys, or even an anchor with the respective cable, on the other hand it can be inefficient when there is a large number of buoys to recover. The rolling and unrolling times are in fact high.

[0007] The present invention starts from the technical problem of providing a winch which is capable of meeting the needs mentioned above with reference to the prior art, and to overcome the above-mentioned drawback and/or to allow further advantages to be achieved.

[0008] This is achieved by a winch, a use and a method as defined in the respective independent claims. Secondary characteristics are covered by the respective dependent claims.

[0009] In particular, the invention provides a winch comprising a support frame with a seat, a rotating drum or cylinder, and actuation means for actuating the rotation of the rotating drum or cylinder. According to an aspect of the invention, the rotating cylinder or drum is mounted in a removable fashion in the seat of the support frame.

[0010] Furthermore, the frame comprises a door capable of adopting a closed position and an open position. In particular, in the closed position the door closes the seat of the frame and protects the drum inside the seat,

while when the door is in the open position the drum can be inserted or removed with respect to the seat of the frame.

[0011] According to a preferred embodiment of the invention it is therefore possible to quickly remove a whole reel from the support frame, that is to say both the drum and the cable wound thereon, for example to replace the cable to be wound.

[0012] In other words, the invention makes it possible to recover a load and, once the winding limit of the rope on the reel has been reached, it is possible to replace the reel in a rapid manner in order to recover other loads with a new drum.

[0013] It is possible to quickly repeat the winding operation for all the loads to be recovered.

[0014] In this way it is possible to significantly optimise the recovery times of floating or submerged loads, as it is not necessary to unwind the rope or cable already recovered before carrying out a new recovery.

[0015] Furthermore, in the event of wear or failure of the actuation cable associated with the drum, the winch according to the invention makes replacement quicker thanks to the possibility of quickly removing the reel to replace it with another.

[0016] Further advantages, characteristics and methods of use of the object of the invention will become evident from the following detailed description of its embodiments, presented merely by way of non-limiting examples.

[0017] It is however evident that each embodiment of the object of this disclosure can have one or more of the advantages listed above; however, no embodiment is required to simultaneously have all the listed advantages.

[0018] Reference will be made to the accompanying drawings, wherein:

- Figures 1 and 2 show a front perspective view of a winch according to an embodiment of the invention;
- Figure 3 shows a section of the winch of Figures 1 and 2;
- Figures 4 and 5 show a section of the winch of Figures 1 and 2 wherein the passages for extracting the drum from the respective support frame are visible;
- Figure 6 shows a side view of a winch according to an embodiment of the invention;
- Figure 7 shows a side view, opposite to the view of Figure 6, of a winch according to an embodiment of the invention;
- Figure 8 shows a rear view of a winch according to an embodiment of the invention;
- Figure 9 shows a side view, similar to the view of Figure 6, of a winch according to an embodiment of

the invention;

- Figure 10 shows a top view of a winch according to an embodiment of the invention;
- Figure 11 shows a front perspective of a winch according to an embodiment of the invention;
- Figures 12 and 13 show a section of the winch of Figure 11.

[0019] With reference to the attached figures, the reference number 100 indicates as a whole a winch according to an embodiment of the invention.

[0020] The winch 100 comprises a support frame 1 having a seat 17, a drum 2 defining an axis of rotation, and actuation means configured to activate the rotation of the drum 2 about the axis of rotation. The drum 2 is also mounted in a removable manner in the seat 17 of the support frame 1, that is, it is possible to uncouple the drum 2 from the frame 1 for example to replace the drum 2.

[0021] Moreover, the support frame 1 comprises a door 14, which is configured to adopt a closed position C and an open position D. In particular, in the closed position C the door 14 can protect the drum 2 in the seat 17 of the frame 1, while in the open position D it can allow the drum 2 to be inserted or removed in/from the seat 17 of the frame 1. In other words, the door 14 can move to the open position D to allow the drum 2 to be extracted or re-inserted from/in the seat 17 of the frame 1, for example to replace the drum 2. The door 14 can also pass to the closed position C to protect the drum 2, for example when the winch 100 is in use and the rotation of the drum 2 can be actuated.

[0022] Preferably, the support frame 1 comprises a first support element 11 having an end inserted in an axial through hole of the drum 2.

[0023] The first support element 11 is configured to be able to alternatively adopt an operating position A, wherein the first support element 11 supports the drum 2, and a release position B, wherein the first support element 11 allows the drum 2 to be uncoupled from or re-associated with the support frame 1. The first support element 11 has the shape of a shaft with a square section in order to be able to transmit a rotational motion to the drum 2. In other words, the first support element 11 can transmit a rotational motion to the drum 2, by coupling with the latter, thanks to the shaft shape with a square section.

[0024] In the release position the first support element 11 is extracted towards an external area outside the frame 1, so as to be able to free the drum 2 from the seat 17 where it is positioned.

[0025] In other words, when the first support element 11 is in the operating position A the drum 2 is supported, and a rotation of the drum 2 can be actuated by the actuation means. When the first support element 11 is in the release position B, the drum 2 is free to be handled

as a separate body from the support frame 1 to be uncoupled from or re-associated with it.

[0026] According to a preferred embodiment, the frame 1 comprises a translation region 13 of the first support element 11. In particular, the first support element 11 is configured to translate along a direction coinciding with the rotational axis of the drum 2. By means of the translation, the first support element 11 can pass from the operating position A to the release position B, or vice versa.

[0027] Preferably, with reference to Figure 3, the winch 100 comprises a second support element 12. The first support element 11 can be positioned at one end of the drum 2, along the axis of rotation of the drum 2, and the second support element 12 can be positioned at a second end of the drum 2 on the same axis of rotation. In particular, the second support element 12 is preferably fixed, that is to say, it can be associated with the support frame 1 in a fixed manner. The second support element 12 also has shape of a shaft, preferably a shaft shape with a square section. Both the first support element 11 and the second support element 12 are inserted in an axial internal cavity of the drum 2.

[0028] The actuation means are preferably connected to the first support element 11, by means of a motion transmission element 51, such as a motion transmission chain or belt which is mounted on the first support element 11 in the translation region 13. More details on the motion transmission are given below.

[0029] Preferably, as mentioned, the first support element 11 and the second support element 12 are substantially solid bodies with square sections configured to support the drum 2, in particular they comprise a portion that can be associated with the drum 2 near its axis of rotation, so as to allow the rotation of the drum 2. Moreover, the support frame 1 can comprise bearings 29 in a known manner to allow the rotation of the first and second support elements 11, 12 and consequently the rotation of the drum 2 supported by them.

[0030] More specifically, the support frame 1 has a box-like shape and comprises a first wall 31 into which the first support element 11 is inserted through and a second wall 32 into which the second support element 12 is inserted through.

[0031] The support frame 1 further comprises a grip element 18 associated with the first support element 11 which can be used by a user to translate the first support element from the operating position A to the release position B, or vice versa. In order to make the first support element 11 translate, a release and recoupling system can be provided, configured to lock the first support element 11 in the operating position A or in the release position B by means of safety elements, such as, for example, spring elements.

[0032] By means of partial rotation and a translation of the first support element 11 towards the release position B, it is possible to release the drum 2 from the first support element 11 so as to allow the extraction of the drum 2

from the seat 17, as shown in the Figures 4 and 5.

[0033] Moreover, the first support element can be made to translate again towards the operating position A once the drum 2 or another drum has been reinserted inside the seat 17, so as to re-associate the drum itself to the support frame 1.

[0034] Preferably, the winch 100 comprises a thread-like or rope-like body, for example a cable or a rope (not shown in the drawings), wound on the drum 2 to form a reel.

[0035] In particular, the operating position A preferably corresponds to a winding condition of the thread-like or rope-like body on the drum 2. In other words, when the first support element 11 is in the operating position A and the drum 2 is associated with the support frame 1, the thread-like or rope-like body can be wound on the drum 2.

[0036] According to a preferred embodiment, the winch 100 further comprises a thread guide element 15, associated with a translation shaft 19 having an axis parallel to the axis of the drum 2.

[0037] The thread guide element 15 is configured to be able to translate along the axis of the translation shaft 19 and to guide the suitable winding of the thread-like or rope-like body on the drum 2. In particular, a condition of translation of the thread guide element 15 along the axis of the translation shaft 19 corresponds to the winding of the thread-like or rope-like body on the drum 2.

[0038] In other words, when the thread guide element is made to translate, the thread-like or rope-like body is wound on the drum 2 by means of the rotation of the latter.

[0039] Preferably, the thread guide element 15 has an opening 16 open on an edge with an access mouth for a passage in insertion and/or extraction of the thread-like or rope-like body. In other words, the thread-like or rope-like body can be inserted or extracted from the thread guide element 15 by means of a passage through the above-mentioned opening 16.

[0040] According to a preferred embodiment, the support frame 1 comprises a sensor 40 configured to allow the activation of the actuation means when the door 14 is in the closed position C and to prevent the activation of the actuation means when the door 14 is in the open position D. For example, when the door 14 is in the closed position C, the sensor 40 can close an electrical circuit connected to the actuation means and allow the latter to start. Moreover, when the door 14 is in the open position D, the sensor 40 is unable to close the above-mentioned electrical circuit and the actuation means cannot be started.

[0041] Preferably, the sensor 40 is configured to switch off the actuation means when the door 14 is in the open position D, so that the drum 2 cannot rotate.

[0042] According to a preferred embodiment, the actuation means comprise a motor, for example an electric motor or an internal combustion engine. The motor can be used to actuate the rotation of the drum 2 by means of a first transmission element 51, for example a chain or a transmission belt. In particular, the motor actuates,

by means of the first transmission element 51, a rotation of the first support element 11 when it is in the operating position A, and the first support element 11 consequently transmits the rotational motion to the drum 2 with which it is associated. The drum 2 can in turn transmit a rotational motion to the second support element 12.

[0043] Preferably, the support frame 1 comprises a casing 33 defining the above-mentioned translation region 13, and configured to also house the first transmission element 51. Even more preferably, the casing 33 is configured to also house the actuation means.

[0044] According to a preferred embodiment, the second support element 12 is configured to transmit, by means of a second transmission element 52, a rotational motion to the translation shaft 19, which is configured to allow the translation of the thread guide element 15 along its axis. In other words, the translation shaft 19 is rotated by means of a transfer of rotational motion from the second support element 12, by means of the second transmission element 52, for example a chain or a transmission belt which can be associated with one or more gear wheels. Moreover, the rotation of the translation shaft 19 can transmit a translation motion to the thread guide element 15, which can translate along the axis of the translation shaft 19 itself, for example by means of a coupling by means of a pawl associated with the thread guide element 15.

[0045] According to a preferred embodiment, the winch 100 comprises a braking unit 30 configured to prevent a rotation of the drum 2 in the opposite direction to that of winding the thread-like or rope-like body thereon. In particular, the braking unit 30 can be operated or activated to block any rotation of the drum 2 contrary to the winding of the thread-like or rope-like body, in such a way as to prevent unwanted unwinding of the thread-like or rope-like body from the drum 2. For example, the braking unit 30 can comprise a freewheel mechanism which, when operated or activated, allows the drum 2 to rotate only in the winding direction and blocks the rotation in the opposite direction. Preferably, the braking unit 30 can be deactivated so as to allow rotation of the drum 2 in the opposite direction to the winding of the thread-like or rope-like body, for example when it is necessary to unroll the latter from the drum 2.

[0046] According to a preferred embodiment, the support frame 1 comprises one or more anchoring elements 60, 61 configured to allow the winch 100 to be fixed in a removable manner to the boat. The one or more anchoring elements 60, 61 can be, for example, eyebolts for connecting the winch 100 to the boat by means of a rope or cable. In other words, a rope or cable can be used to connect the winch 100 to the boat, by passing the rope or cable through the eyebolts, for example to prevent unwanted movement of the winch 100 during use.

[0047] The winch according to one of the embodiments described here is used to wind a thread-like or rope-like body connected to a mass. For example, it can be used to wind a rope connected to a submerged weight that

anchors a buoy used during a race or regatta.

[0048] Preferably, the drum 2 is removed after having been used to wind a first thread-like or rope-like body connected to a first mass. Subsequently, a second drum is positioned in the seat 17 of the frame 1 to wind a second thread-like or rope-like body connected to a second mass. For example, a first rope connected to a first buoy is wound around the drum 2 by means of its rotation. The reel formed is removed from the seat 17 of the frame 1 and replaced with a second drum used to wind a second rope connected to a second buoy.

[0049] A method for using the winch 100 according to one of the embodiments described provides for the following steps.

[0050] Initially, the first support element 11 is placed in the operating position A, so as to support the drum 2, and the door 14 is placed in the closed position C. Subsequently, the actuation means activate a rotation of the drum 2 and a consequent translation of the thread guide element 15 along the axis of the translation shaft 19, to wind a first thread-like or rope-like body around the drum 2, for example until reaching a complete winding of a rope around the drum 2. The rotation of the drum 2 is stopped and the handle element 18 is actuated so as to make the first support element 11 pass from the operating position A to the release position B. Lastly, the door 14 is placed in the open position D and the reel formed is extracted from the seat 17 of the support frame 1.

[0051] Preferably, the described method provides for the following further steps.

[0052] A second drum is inserted in the seat 17 of the support frame 1 and the door 14 is placed again in the closed position C. The handle element 18 is actuated so as to make the first support element 11 pass from the release position B to the operating position A, so as to support the second drum. Finally, the actuation means activate a rotation of the drum and a consequent translation of the thread guide element 15 along the axis of the translation shaft 19, to wind a second thread-like or rope-like body around it.

[0053] The second drum, once the second thread-like or rope-like body has been wound, can be removed from the seat 17 and replaced with a third drum similarly to what has been described above.

[0054] This method can be repeated as many times as necessary to wind further thread-like or rope-like bodies, connected to as many other floating or submerged masses, for example to retrieve or tow several buoys connected to their respective ropes during a regatta or a race in an expanse of water.

[0055] It is to be understood that the winch 100 according to the invention can also be used in environments other than the nautical environment.

[0056] The invention has thus far been described with reference to its embodiments. It is to be understood that there may be other embodiments pertaining to the same inventive core, all falling within the scope of protection of the claims set forth below.

Claims

1. A winch (100) comprising:

- a support frame (1) having a seat (17);
- a drum (2) defining an axis of rotation;
- actuation means, configured to actuate the rotation of said drum (2) around said axis of rotation;

wherein said drum (2) is mounted in a removable manner in the seat (17) of said support frame (1), and wherein said frame (1) comprises a door (14) configured to adopt a closed position (C) and an open position (D), wherein in said closed position said door (14) closes said seat (17) and protects said drum (2) in said seat (17), and wherein in said open position (D) said door (14) allows an insertion or removal of said drum (2) with respect to the seat (17) of said frame (1).

2. The winch (100) according to claim 1, wherein said support frame (1) comprises at least a first support element (11), configured to be able to alternatively adopt an operating position (A), wherein in said operating position (A) the first support element supports said drum (2), and a release position (B), wherein in said release position (B) the first support element (11) allows said drum (2) to be uncoupled from or re-associated with said support frame (1).

3. The winch according to the preceding claim, comprising a thread-like body or rope-like body wound on said drum (2) to form a coil or spool structure, and wherein said operating position (A) corresponds to a winding condition of said thread-like or rope-like body.

4. The winch (100) according to the preceding claim, wherein said frame comprises a translation region (13) of said first support element (11) and said first support element (11) is configured to translate along a direction coinciding with the axis of rotation of said drum (2), so as to pass from said operating position (A) to said release position (B), or vice versa.

5. The winch (100) according to any one of claims 2 to 4, wherein said frame (1) comprises a second support element (12) and wherein said first support element (11) is positioned at a first end of said drum (2) along said axis of rotation, and said second support element (12) is positioned at a second end of said drum (2) on said axis of rotation, wherein said second support element (12) is configured in order not to be able to translate along said axis of rotation.

6. The winch (100) according to any one of claims 2 to 5, wherein said actuation means are configured to

transmit a rotational motion to said first support element (11) by means of a first transmission element (51).

7. The winch (100) according to any one of the preceding claims, wherein said frame (1) comprises a thread guide element (15), associated with a translation shaft (19) which has an axis parallel to said axis of rotation of the drum (2), wherein the thread guide element (15) is configured to be able to translate along the axis of said translation shaft (19) and to guide a winding of a thread-like or rope-like body on said drum (2), wherein a condition of translation of said thread guide element (15) corresponds to said winding of said thread-like or rope-like body on said drum (2). 5
8. The winch (100) according to the preceding claim, wherein said thread guide element (15) has an opening (16) open up to an edge to define an access mouth for a passage in insertion and/or extraction of said thread-like or rope-like body. 20
9. The winch (100) according to any one of claims 6 to 8, wherein said second support element (12) is configured to transmit a rotational motion to said translation shaft (19) by means of a second transmission element (52). 25
10. The winch (100) according to any one of the preceding claims, wherein the support frame (1) comprises a sensor (40) configured to allow the activation of said actuation means when said door (14) is in the closed position (C) and to prevent the activation of said actuation means when said door (14) is in the open position (D). 30 35
11. The winch (100) according to any one of the preceding claims, wherein said actuation means comprise a motor, for example an electric motor or an internal combustion engine. 40
12. The winch (100) according to any one of the preceding claims, comprising a braking unit (30) configured to be able to be activated in such a way as to block a rotation of said drum (2) in the opposite direction to that of winding a thread-like or rope-like body on said drum (2). 45
13. The winch (100) according to any one of the preceding claims, wherein said frame (1) comprises one or more anchoring elements (60, 61) configured to allow the winch (100) to be fixed in a removable manner to a boat. 50
14. A use of a winch (100) according to any one of the preceding claims, wherein said drum (2) is rotated to wind a first thread-like or rope-like body connected 55

to a first mass.

15. The use according to the preceding claim, wherein said drum (2) is removed after being used to wind a first thread-like or rope-like body connected to a first mass, and a second drum is positioned to wind a second thread-like or rope-like body connected to a second mass.
16. A method of using a winch (100) according to any one of claims 1 to 13 in combination with claim 3, wherein:
 - the first support element (11) is placed in the operating position (A), so as to support said drum (2), and the door (14) is placed in the closed position (C);
 - the actuation means activate a rotation of said drum (2) to wind a first thread-like or rope-like body around it;
 - the rotation of said drum (2) is stopped and the handle element (18) is operated so as to make the first support element (11) pass from the operating position (A) to the release position (B);
 - the door (14) is placed in the open position (D) and said drum (2) is extracted with said thread-like or rope-like body from the seat (17) of the support frame (1).
17. A method of using a winch (100) according to the preceding claim, wherein successively:
 - a second drum is inserted in the seat (17) of the support frame (1) and the door (14) is placed in the closed position (C);
 - the handle element (18) is operated so as to move the first support element (11) from the release position (B) to the operating position (A), so as to support the second drum;
 - the actuation means activate a rotation of said second drum to wind a second thread-like or rope-like body around it.

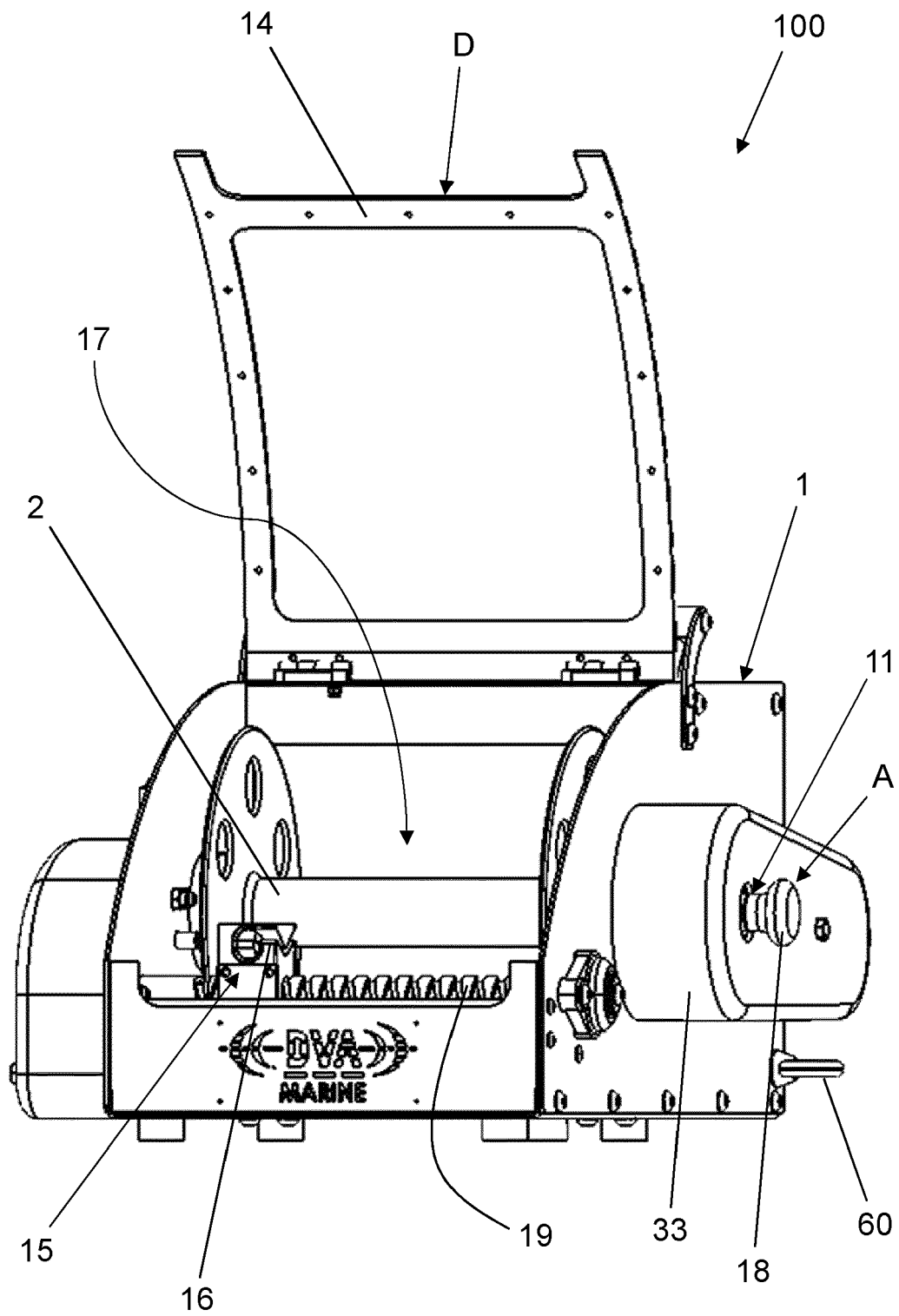


FIG. 1

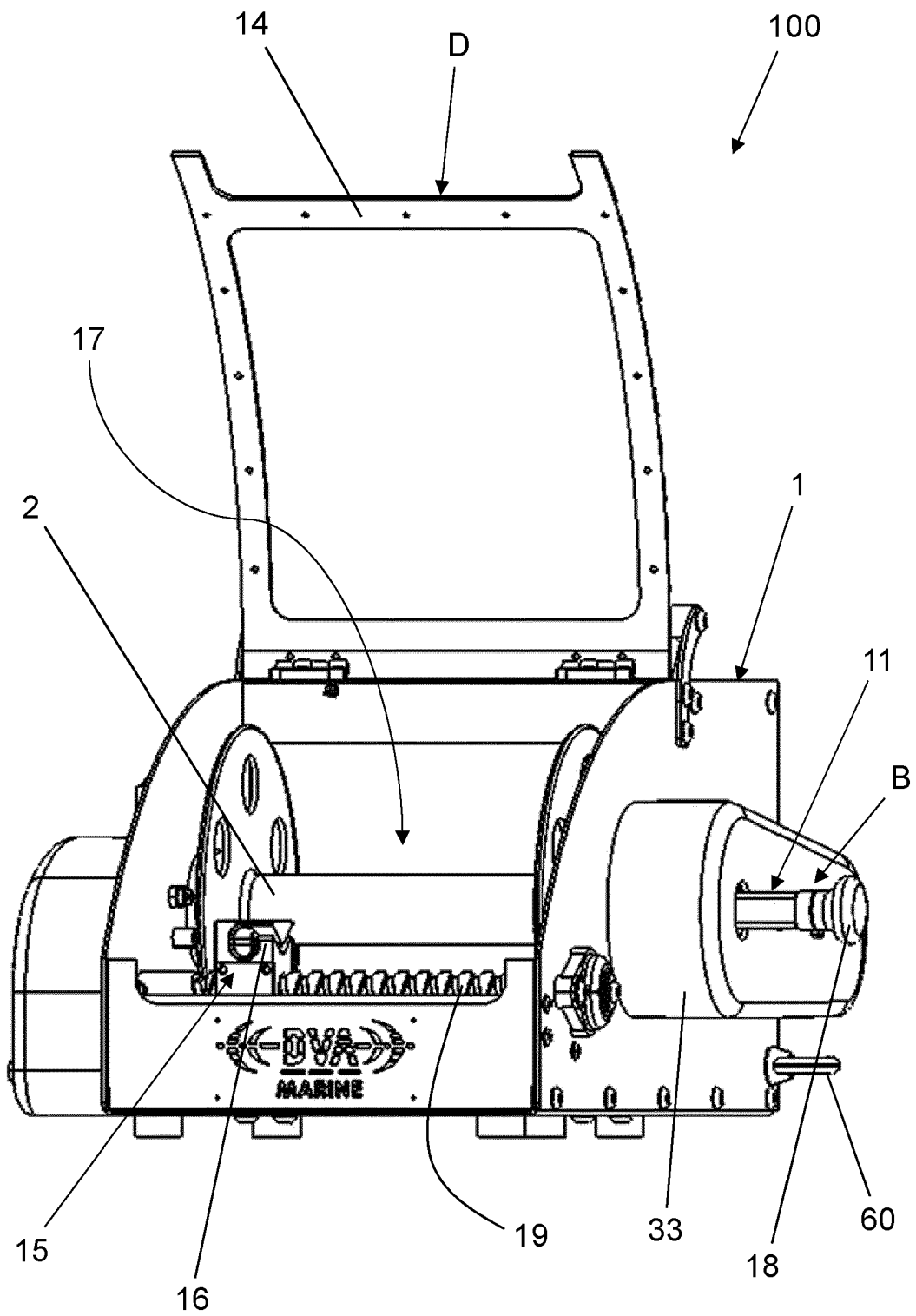
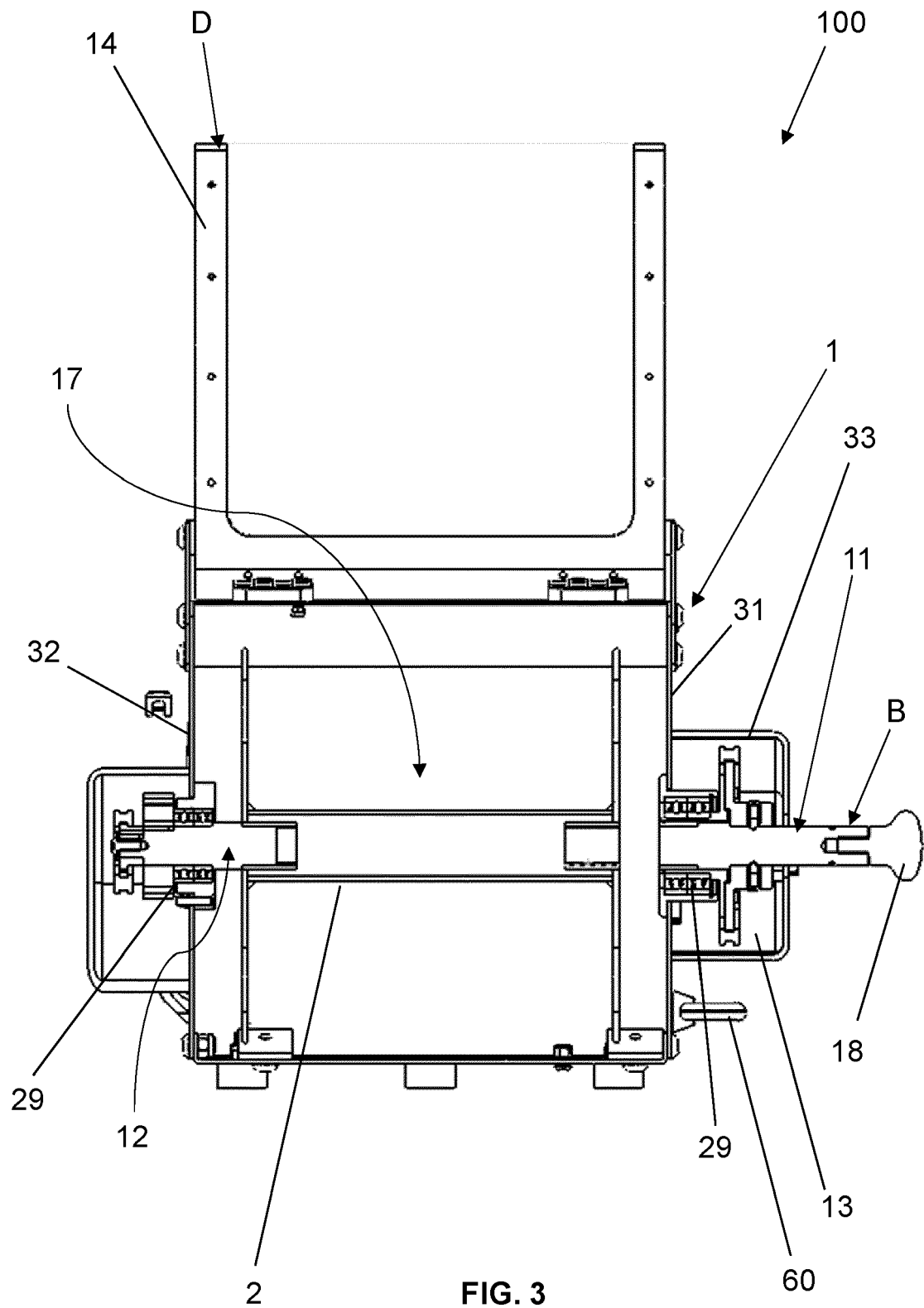


FIG. 2



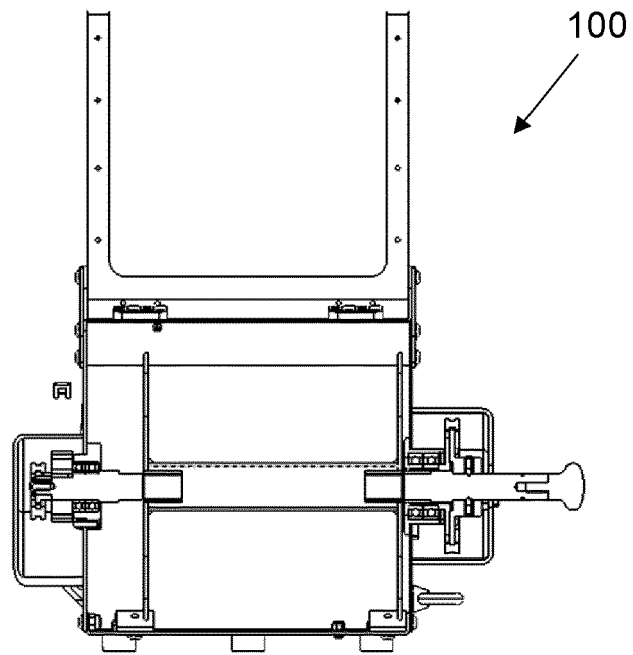


FIG. 4

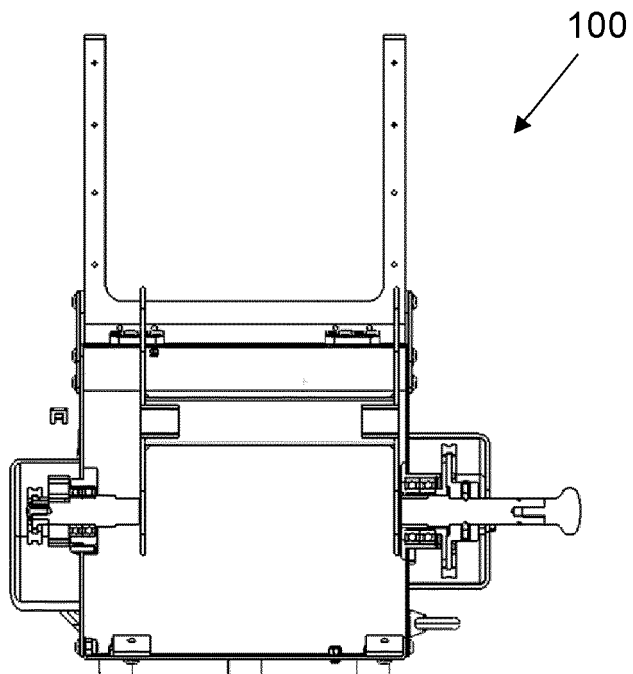
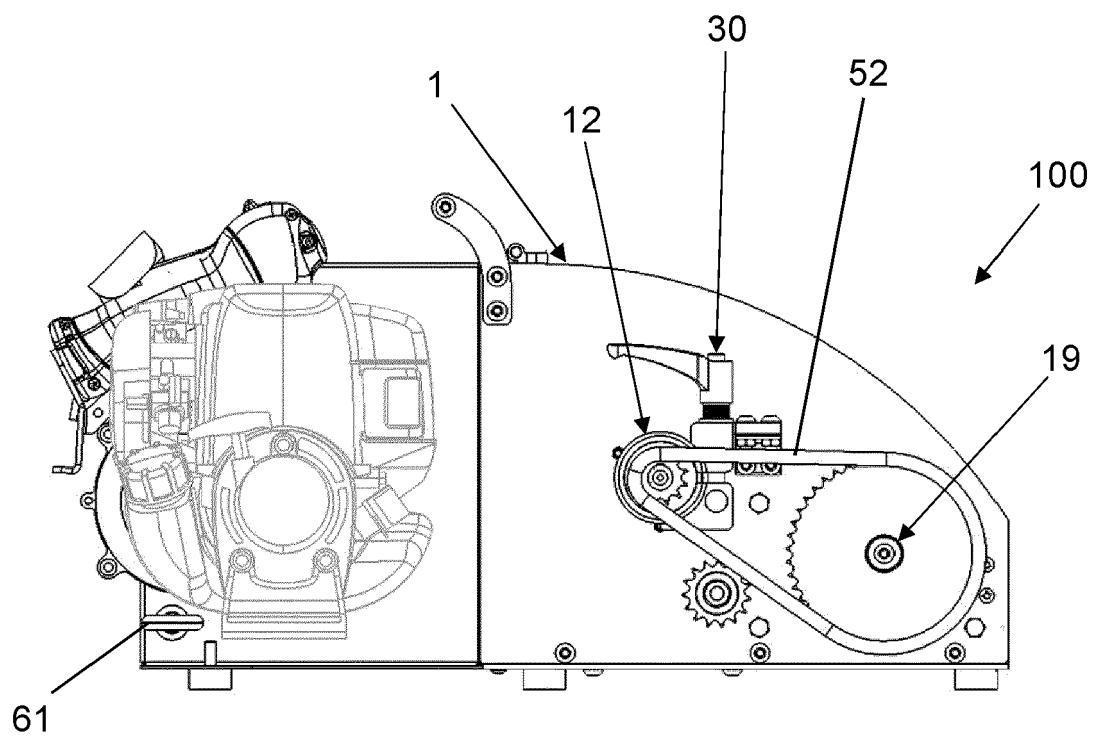
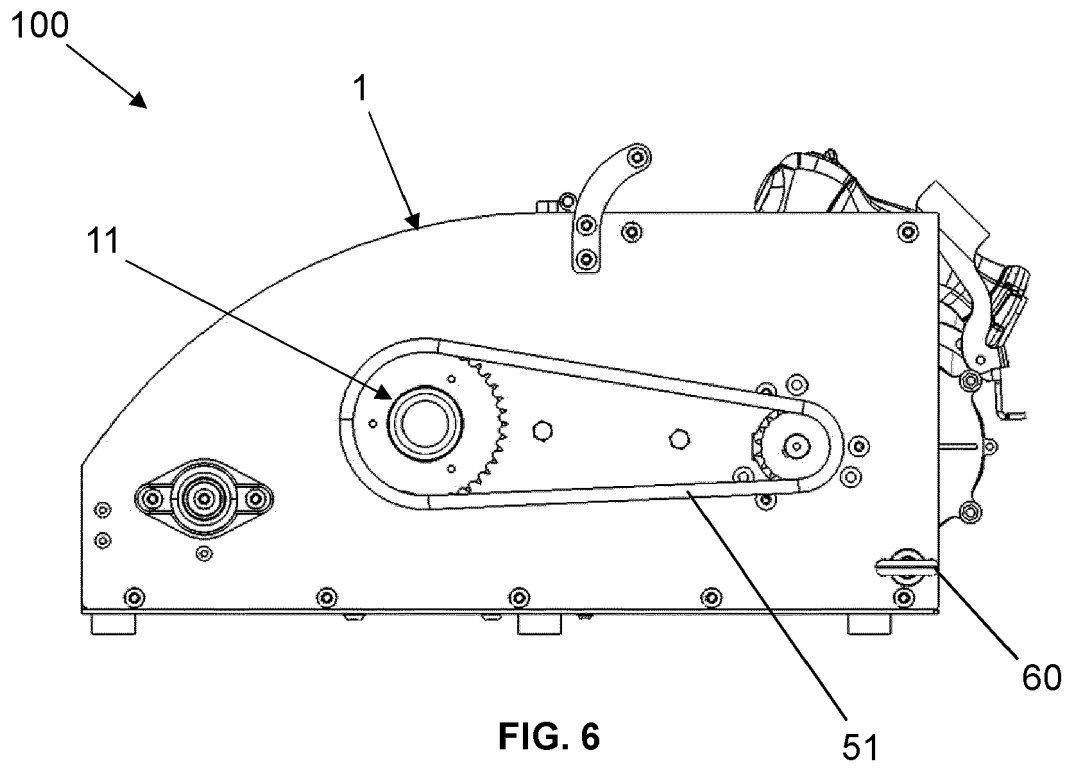


FIG. 5



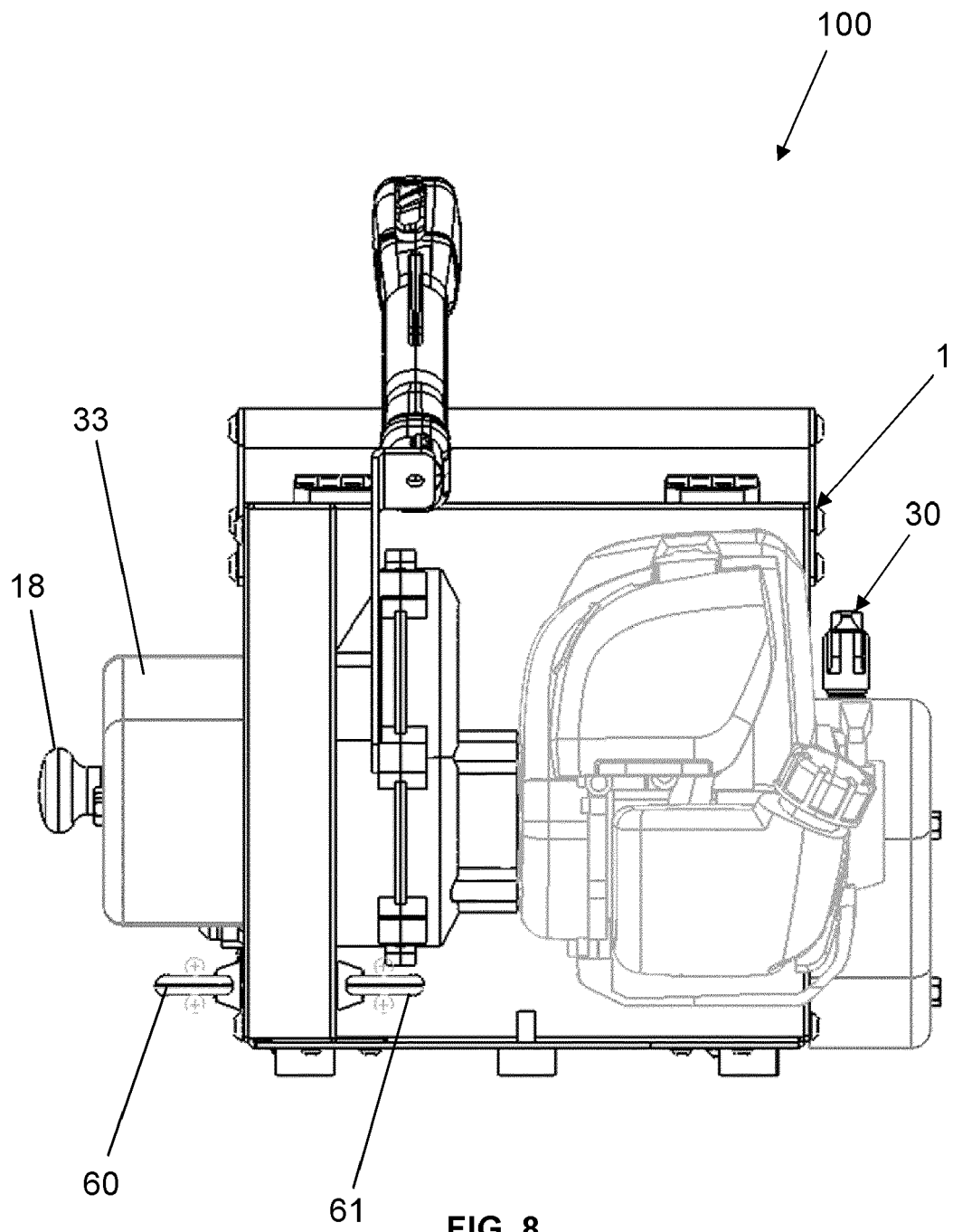


FIG. 8

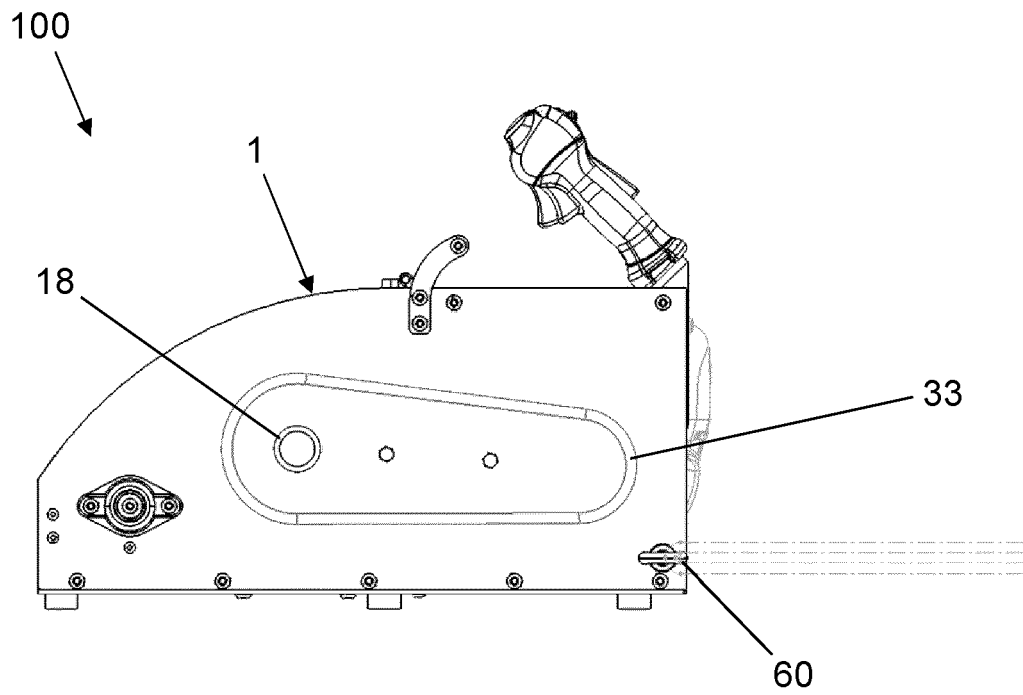


FIG. 9

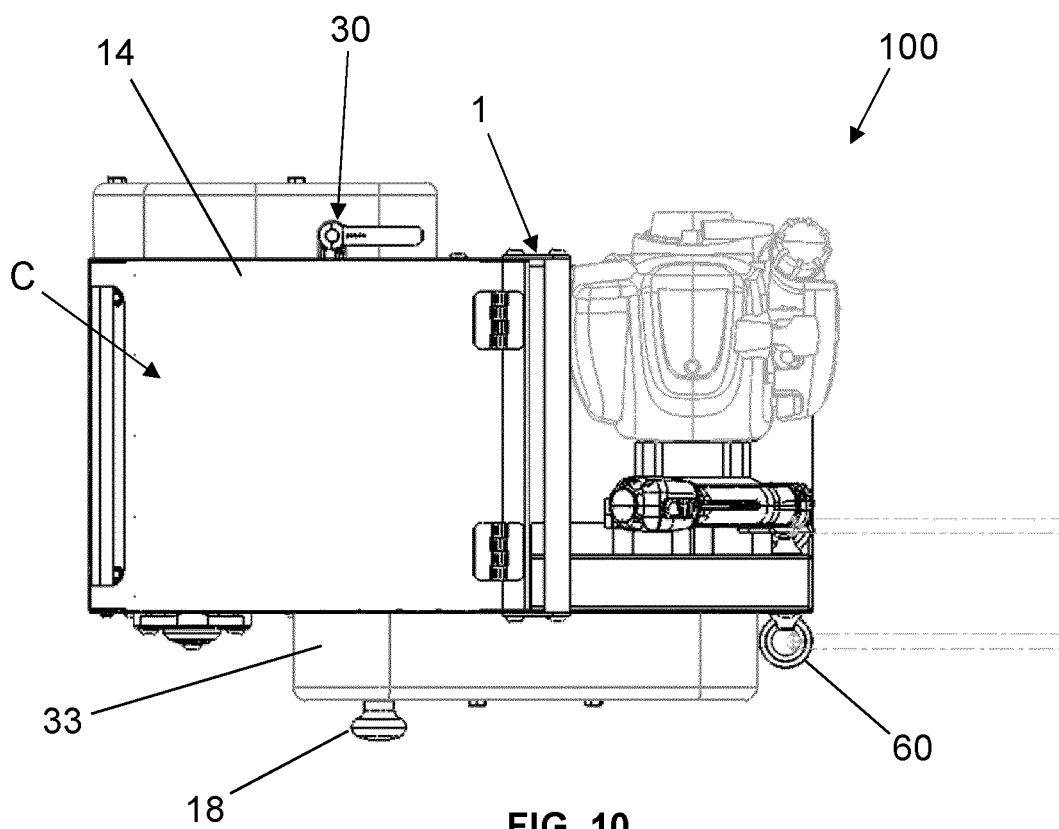


FIG. 10

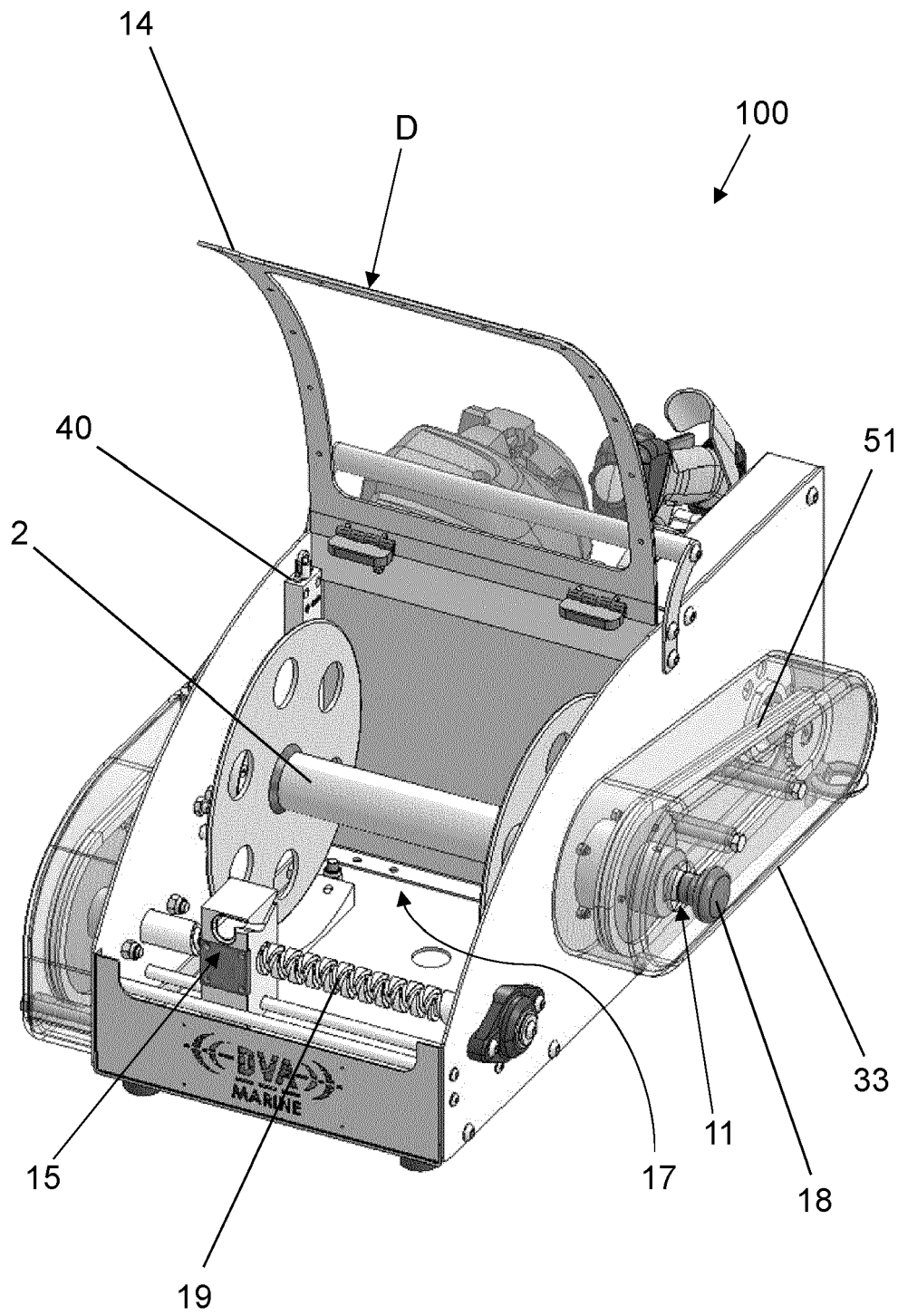


FIG. 11

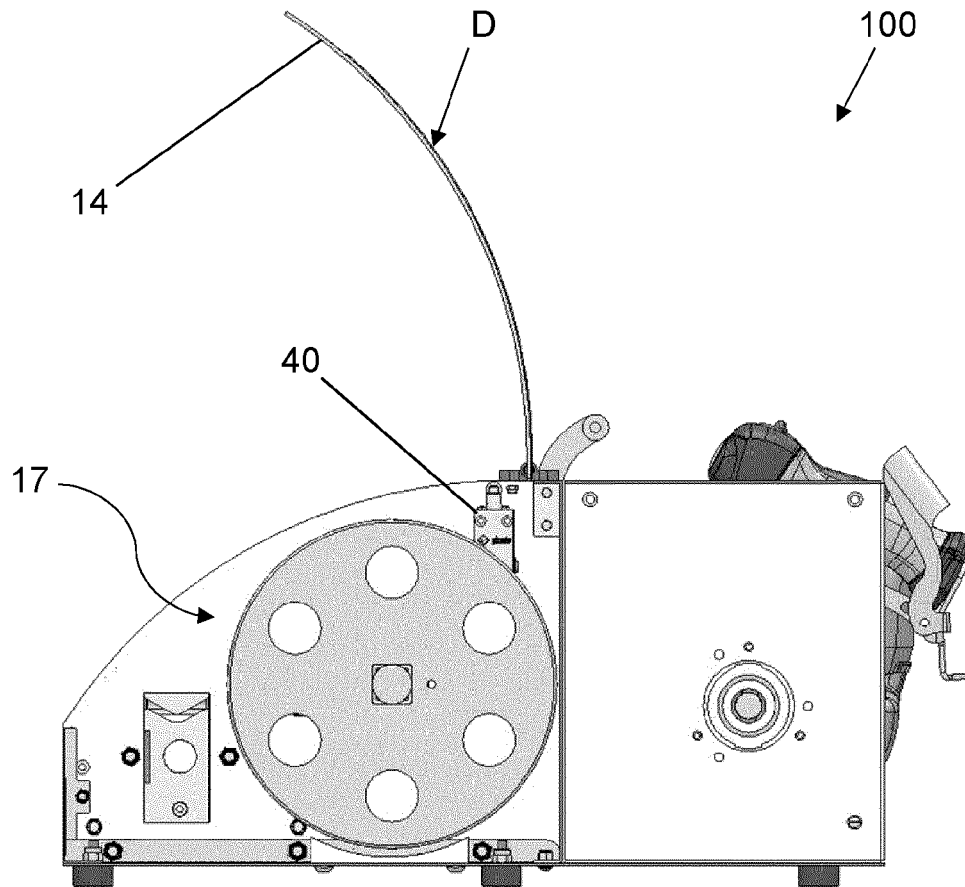


FIG.12

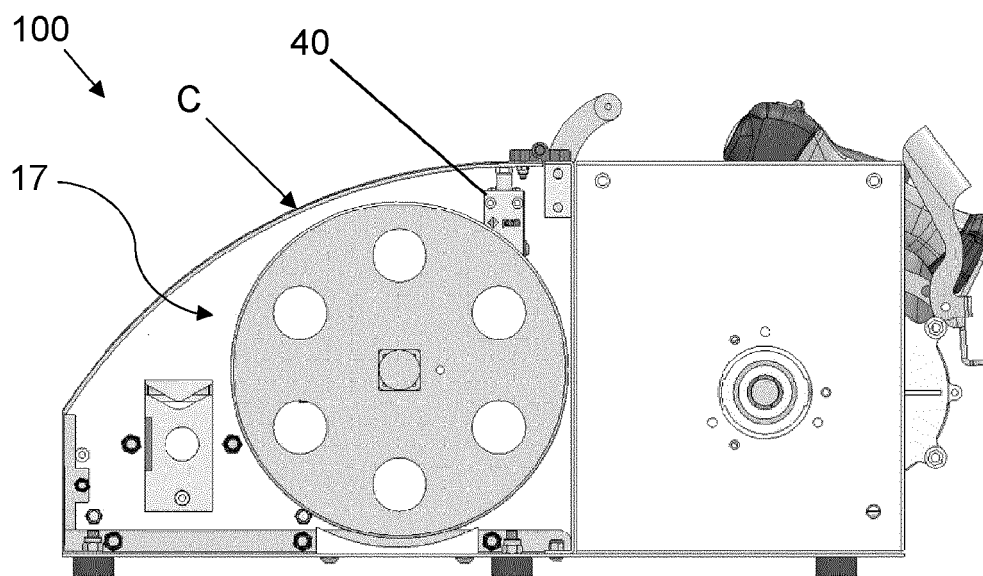


FIG. 13



EUROPEAN SEARCH REPORT

Application Number

EP 22 18 2664

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EPO FORM 1503 03.82 (P04C01)

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	SU 631 437 A1 (TATARSK GNI PI NEFTYANOJ [SU]) 5 November 1978 (1978-11-05) * the whole document *	1-17	INV. B66D3/26 B66D1/30
A	DE 42 39 672 A1 (ROTZLER GMBH CO [DE]) 1 June 1994 (1994-06-01) * claim 1; figure 1 *	1-17	
A	EP 3 328 783 A1 (JENOPTIK ADVANCED SYS GMBH [DE]) 6 June 2018 (2018-06-06) * claim 1; figure 2 *	1-17	
A	DE 88 01 869 U1 (PETER LANCIER MASCHINENBAUHAFFENHUTTE) 30 June 1988 (1988-06-30) * figures 1,2 *	1-17	
			TECHNICAL FIELDS SEARCHED (IPC)
			B66D
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 21 November 2022	Examiner Serôdio, Renato
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 22 18 2664

5

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

21-11-2022

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
SU 631437	A1	05-11-1978	NONE

DE 4239672	A1	01-06-1994	NONE

EP 3328783	A1	06-06-2018	CN 107848777 A 27-03-2018
		DE 102015009700 A1 02-02-2017	
		EP 3328783 A1 06-06-2018	
		US 2018215594 A1 02-08-2018	
		WO 2017017250 A1 02-02-2017	

DE 8801869	U1	30-06-1988	NONE

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