



(12) **EUROPEAN PATENT APPLICATION**
published in accordance with Art. 153(4) EPC

(43) Date of publication:
05.04.2023 Bulletin 2023/14

(51) International Patent Classification (IPC):
A63B 35/12 (2006.01) **B63C 11/02** (2006.01)

(21) Application number: **20937959.3**

(86) International application number:
PCT/CN2020/092869

(22) Date of filing: **28.05.2020**

(87) International publication number:
WO 2021/237561 (02.12.2021 Gazette 2021/48)

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
KH MA MD TN

(72) Inventors:
• **XIONG, Minglei**
Beijing 102199 (CN)
• **CHEN, Longdong**
Beijing 102199 (CN)
• **ZHAO, Yingfei**
Beijing 102199 (CN)

(30) Priority: **26.05.2020 CN 202010453848**

(74) Representative: **Cleanthous, Marinos**
IOANNIDES CLEANTHOUS AND CO LLC
4 Prometheus Street, 3 Floor
1065 Nicosia (CY)

(71) Applicant: **Boya Gongdao (Beijing) Robot Technology Co., Ltd**
Beijing 102199 (CN)

(54) **COMPACT EGG-SHAPED PROPELLER**

(57) Disclosed is a compact egg-shaped propeller, including an outer shell, an inner shell, and a driving motor unit arranged in the inner shell. The outer shell is detachably connected to the inner shell; the outer shell is egg-shaped; the outer shell is provided with a front cover at a top of the driving motor unit; the outer shell is provided with a jet orifice at a tail portion of the driving motor unit; blades are connected to one side of the driving motor unit close to the front cover; the driving motor unit is connected to a main control compartment; foldable handles are connected to a left side and right side of the main control compartment respectively; and the foldable handles are movably connected to the inner shell. By means of the layout, the gravity center is centered, the structure is compact and simple, and the appearance is simple and beautiful; the blades and the motor are designed in front, and the semi-circular front cover prevents debris and hands from entering; a battery indicator can display current remaining power to a user; a buoyancy block ensures that the whole device does not sink down after a user loosens the hands in water, facilitating search; and when the device is not in use, the handles can be folded, thereby facilitating storage and carrying.

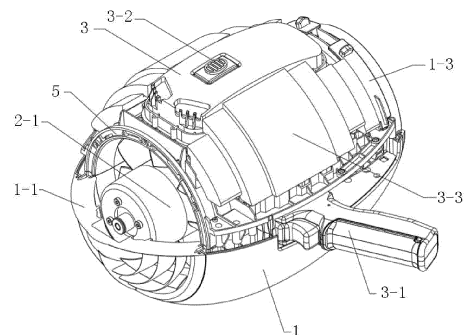


FIG. 1

Description

TECHNICAL FIELD

[0001] The present disclosure relates to the technical field of propellers, specifically to a compact egg-shaped propeller.

BACKGROUND

[0002] Most of single-barrel propellers on the market are difficult to be compact and integrated. Some of them are huge, even about the size of adults. These propellers are bulky. Without edge sealing, they are not friendly enough. The overall structure is exposed. Necessary accidents are easily caused when they are used. On the other hand, the propellers are extremely inconvenient to carry since their handles generally cannot be folded.

SUMMARY

[0003] For the above technical problems in the related technology, the present disclosure provides a compact egg-shaped propeller, which can overcome the above shortcomings in the prior art.

[0004] In order to achieve the above objective, the technical solution of the present disclosure is implemented below: A compact egg-shaped propeller includes an outer shell, an inner shell, and a driving motor unit arranged in the inner shell. The outer shell is detachably connected to the inner shell; the outer shell is egg-shaped; the outer shell is provided with a front cover at a top of the driving motor unit; the outer shell is provided with a jet orifice at a tail portion of the driving motor unit; blades are connected to one side of the driving motor unit close to the front cover; the driving motor unit is connected to a main control compartment; foldable handles are connected to a left side and right side of the main control compartment respectively; and the foldable handles are movably connected to the inner shell.

[0005] Further, the outer shell is provided with a gap matched with the folding handles; and a handle lock catch for fixing the folding handles is arranged at a tail end of the gap.

[0006] Further, start buttons are arranged on the folding handles.

[0007] Further, a battery is arranged in the driving motor unit; the battery is connected with a motor; and the blades are connected to the motor.

[0008] Further, the driving motor unit is provided with a supporting device inside the inner shell.

[0009] Further, the main control compartment is fixedly mounted on the inner shell; and an upper part of the main control component is provided with a battery indicator.

[0010] Further, buoyancy blocks are mounted on the left and right sides of the main control compartment; and the buoyancy blocks are fixedly mounted on the inner shell.

[0011] Beneficial effects of the present disclosure: By means of the layout, the gravity center is centered, the structure is compact and simple, and the appearance is simple and beautiful. The blades and the motor are designed in front, and the semi-circular front cover prevents debris and hands from entering. The battery is arranged at the back, facilitating a user to take out the battery from the back. The battery indicator can display current remaining power to the user. The buoyancy blocks ensure that the whole device does not sink down and will float on the water after the user loosens the hands in water, facilitating search. When the device is not in use, the handles can be folded, thereby facilitating storage and carrying.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] In order to describe embodiments of the present disclosure or technical solutions in the existing art more clearly, drawings required to be used in the embodiments will be briefly introduced below. It is apparent that the drawings in the descriptions below are only some embodiments of the present disclosure. Those of ordinary skill in the art also can obtain other drawings according to these drawings without making creative work.

FIG. 1 is a vertical view of a compact egg-shaped propeller according to an embodiment of the present disclosure; and

FIG. 2 is a sectional view of a compact egg-shaped propeller according to an embodiment of the present disclosure.

[0013] In the drawings: 1: outer shell; 1-1: front cover; 1-2: jet orifice; 1-3: handle lock catch; 2: driving motor unit; 2-1: blade; 2-2: battery; 2-3: supporting device; 3: main control compartment; 3-1: folding handle; 3-2: battery indicator; 3-3: buoyancy block; 4: inner flowing channel; and 5: inner shell.

DETAILED DESCRIPTION OF THE EMBODIMENTS

[0014] The technical solutions in the embodiments of the present disclosure will be described clearly and completely below in combination with the accompanying drawings of the embodiments of the present disclosure. Apparently, the described embodiments are only part of the embodiments of the present disclosure, not all embodiments. Based on the embodiments in the present disclosure, all other embodiments of those of ordinary skill in the art shall fall within the scope of protection of the present disclosure.

[0015] As shown in FIG. 1 to FIG. 2, a compact egg-shaped propeller according to an embodiment of the present disclosure includes an outer shell 1, an inner shell 5, and a driving motor unit 2 arranged in the inner shell 5. The outer shell 1 is detachably connected to the inner shell 5. The outer shell 1 is egg-shaped. The outer

shell 1 is provided with a front cover 1-1 at a top of the driving motor unit 2. The outer shell 1 is provided with a jet orifice 1-2 at a tail portion of the driving motor unit 2. Blades 2-1 are connected to one side of the driving motor unit 2 close to the front cover 1-1. The driving motor unit 2 is connected to a main control compartment 3. Foldable handles 3-1 are connected to a left side and right side of the main control compartment 3 respectively. The foldable handles 3-1 are movably connected to the inner shell 5.

[0016] In one specific embodiment of the present disclosure, the outer shell 1 is provided with a gap matched with the folding handles 3-1; and a handle lock catch 1-3 for fixing the folding handles 3-1 is arranged at a tail end of the gap.

[0017] In one specific embodiment of the present disclosure, start buttons are arranged on the folding handles 3-1.

[0018] In one specific embodiment of the present disclosure, a battery 2-2 is arranged in the driving motor unit 2; the battery 2-2 is connected with a motor; and the blades 2-1 are connected to the motor.

[0019] In one specific embodiment of the present disclosure, the driving motor unit 2 is provided with a supporting device 2-3 inside the inner shell 5.

[0020] In one specific embodiment of the present disclosure, the main control compartment 3 is fixedly mounted on the inner shell 5; and an upper part of the main control component 3 is provided with a battery indicator 3-2.

[0021] In one specific embodiment of the present disclosure, buoyancy blocks 3-3 are mounted on the left and right sides of the main control compartment 3; and the buoyancy blocks 3-3 are fixedly mounted on the inner shell 5.

[0022] In order to facilitate the understanding of the above technical solution of the present disclosure, the above technical solution of the present disclosure is described in detail below through specific use modes.

[0023] A compact egg-shaped propeller includes an outer shell 1, a driving motor unit 2 and a main control compartment 3.

[0024] All the components of the propeller are all symmetrically arranged along an axial direction. A battery 2-2 and a motor are in front and back arrangement at an axis. A front cover 1-1 will affect the water pushing efficiency. Adding the front cover 1-1 in front of blades 2-1 is to prevent debris and hands from entering. Since the front cover is arc-shaped, a user cannot touch the blades 2-1 even if the hands are thin enough to get in from certain positions.

[0025] The battery 2-2 is arranged at the back, which facilitates the user to take out the battery from the back.

[0026] The folding handles 3-1 of the propeller are held by two hands for operation. ON/OFF buttons are arranged on the folding handles 3-1. A signal will be sent to the main control compartment 3 if the ON/OFF buttons are pressed at the same time. The main control compart-

ment 3 is connected to the battery 2-2 and the motor. At this time, the main control compartment 3 will supply power and an electrical signal to the motor to make the motor rotate to drive the blades 3-1 to rotate as well. After water is sucked from the front cover 1-1 and then pressurized, the water flows into an inner flowing channel 4. The water is then straightened through a supporting device 2-3 and is jetted from the jet orifice 1-1 at the tail, thus generating a thrust.

[0027] The folding handles 3-1 held by the two hands drive the user to move forwards in water. The battery indicator 3-2 can display the current battery power to the user. The buoyancy blocks 3-3 ensure that the whole device does not sink down and will float on the water after the user loosens the hands in water, facilitating search.

[0028] In specific use, according to the compact egg-shaped propeller of the present disclosure, the folding handles are held by the hands. The two folding handles pop up, and the start buttons are triggered. The battery starts to supply power. At this time, water flows through the front cover, is pressurized by the blades and supported by a supporting plate, and is finally jetted out from the tail of the inner flowing channel to generate a forward thrust. The egg model is also friendly.

[0029] After use, the handles are folded and are locked by the handle lock catch. At this time, the entire machine is like an egg. The buoyancy blocks provide enough buoyancy to the propeller in water, so that the propeller floats out of the water.

[0030] In summary, by virtue of the above technical solution of the present disclosure, by means of the layout, the gravity center is centered, the structure is compact and simple, and the appearance is simple and beautiful. The blades and the motor are designed in front, and the semi-circular front cover prevents debris and hands from entering. The battery is arranged at the back, facilitating a user to take out the battery from the back. The battery indicator can display current remaining power to the user. The buoyancy blocks ensure that the whole device does not sink down and will float on the water after the user loosens the hands in water, facilitating search. When the device is not in use, the handles can be folded, thereby facilitating storage and carrying.

[0031] The above is only the preferred embodiments of the present disclosure, and is not intended to limit the present disclosure. Any modifications, equivalent replacements and improvements that are made within the spirit and principle of the present disclosure shall fall within the protection scope of the present disclosure.

Claims

1. A compact egg-shaped propeller, comprising an outer shell (1), an inner shell (5), and a driving motor unit (2) arranged in the inner shell (5), wherein the outer shell (1) is detachably connected to the inner shell (5); the outer shell (1) is egg-shaped; the outer

shell (1) is provided with a front cover (1-1) at a top of the driving motor unit (2); the outer shell (1) is provided with a jet orifice (1-2) at a tail portion of the driving motor unit (2); blades (2-1) are connected to one side of the driving motor unit (2) close to the front cover (1-1); the driving motor unit (2) is connected to a main control compartment (3); foldable handles (3-1) are connected to a left side and right side of the main control compartment (3) respectively; and the foldable handles (3-1) are movably connected to the inner shell (5).

2. The compact egg-shaped propeller according to claim 1, wherein the outer shell (1) is provided with a gap matched with the folding handles (3-1); and a handle lock catch (1-3) for fixing the folding handles (3-1) is arranged at a tail end of the gap.
3. The compact egg-shaped propeller according to claim 1, wherein start buttons are arranged on the folding handles (3-1).
4. The compact egg-shaped propeller according to claim 1, wherein a battery (2-2) is arranged in the driving motor unit (2); the battery (2-2) is connected with a motor; and the blades (2-1) are connected to the motor.
5. The compact egg-shaped propeller according to claim 1, wherein the driving motor unit (2) is provided with a supporting device (2-3) inside the inner shell (5).
6. The compact egg-shaped propeller according to claim 1, wherein the main control compartment (3) is fixedly mounted on the inner shell (5); and an upper part of the main control component (3) is provided with a battery indicator (3-2).
7. The compact egg-shaped propeller according to claim 6, wherein buoyancy blocks (3-3) are mounted on the left and right sides of the main control compartment (3); and the buoyancy blocks (3-3) are fixedly mounted on the inner shell (5).

45

50

55

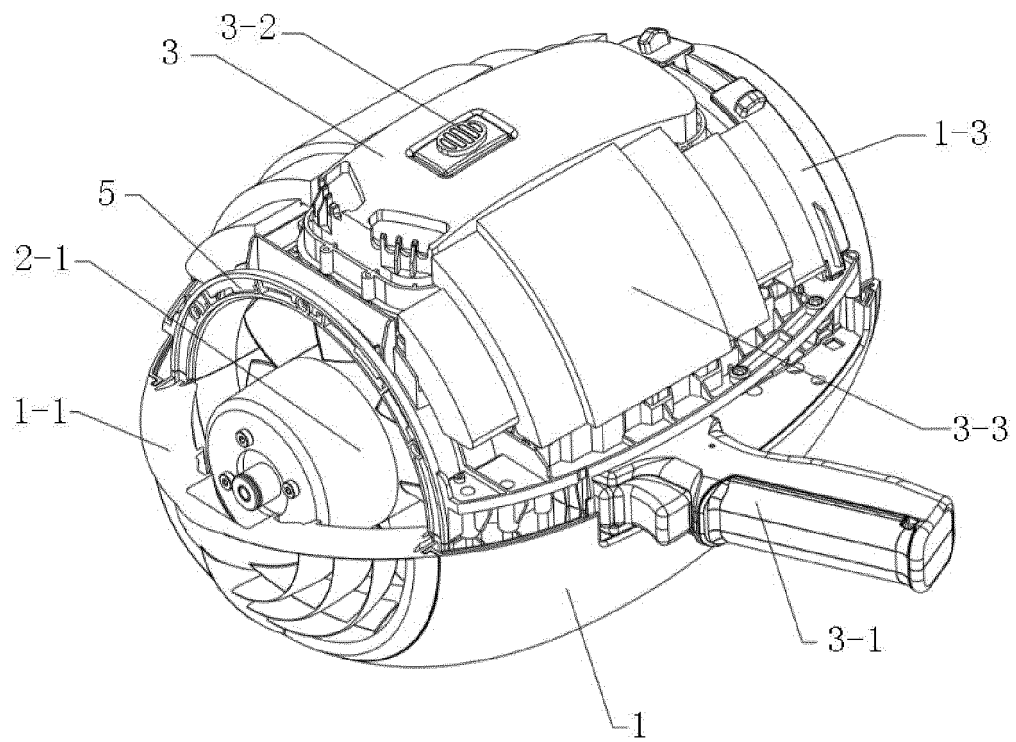


FIG. 1

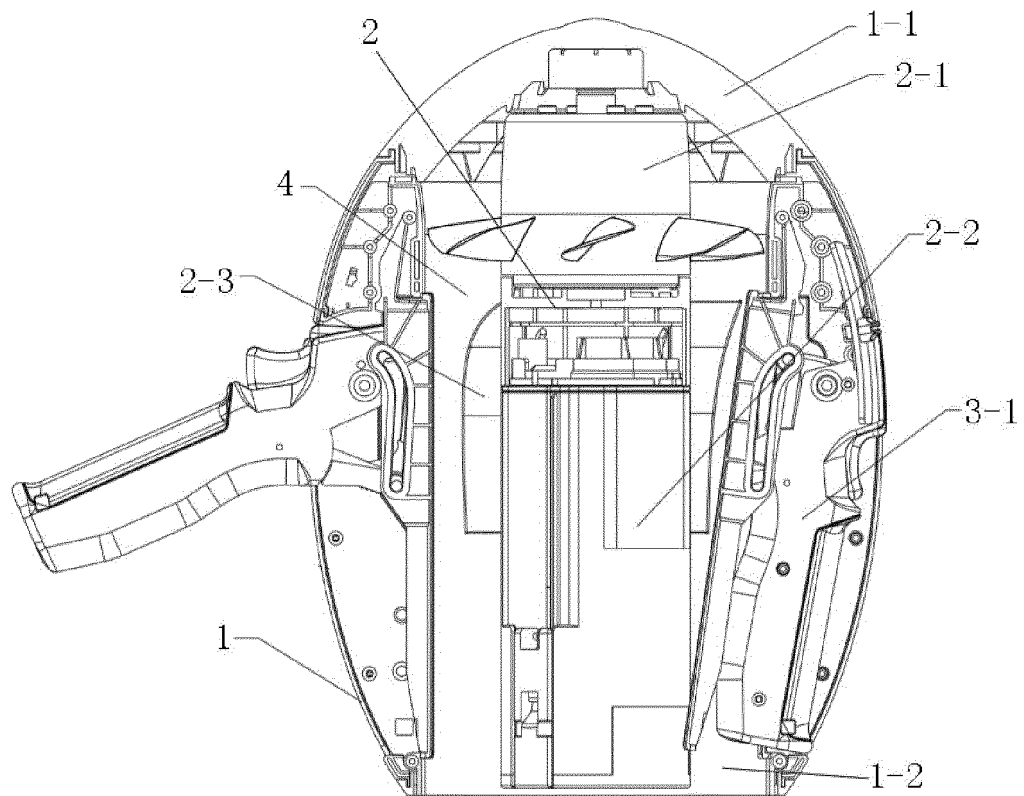


FIG. 2

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2020/092869

5	A. CLASSIFICATION OF SUBJECT MATTER A63B 35/12(2006.01)i; B63C 11/02(2006.01)i According to International Patent Classification (IPC) or to both national classification and IPC	
10	B. FIELDS SEARCHED Minimum documentation searched (classification system followed by classification symbols) A63B35; B63C11; B63G8 Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched	
15	Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) CNABS, CNTXT, CNKI: 蛋形推进器, 推进器, 螺旋桨, 把手, 电池, 电机, 马达; VEN, WOTXT, EPTXT, USTXT: propeller, thrust, handle, battery, motor, gravity.	
20	C. DOCUMENTS CONSIDERED TO BE RELEVANT	
	Category*	Citation of document, with indication, where appropriate, of the relevant passages
	Y	JP S4871597 U (TOMITA, MASA HARU) 08 September 1973 (1973-09-08) description, page 3 paragraph 3 to page 6 paragraph 1 and figures 1-3
25	Y	CN 110758686 A (ROBOSEA (BEIJING) ROBOT SCIENCE AND TECHNOLOGY CO., LTD.) 07 February 2020 (2020-02-07) description, paragraphs 30-61, and figures 1-6
	E	CN 212386672 U (ROBOSEA (BEIJING) ROBOT SCIENCE AND TECHNOLOGY CO., LTD.) 22 January 2021 (2021-01-22) description, paragraphs 17-32, and figures 1-2
30	A	WO 2011083170 A1 (MAYHEM UK LTD. et al.) 14 July 2011 (2011-07-14) entire document
	A	CN 2871376 Y (TEJIA SCIENTIFIC RESEARCH CO., LTD.) 21 February 2007 (2007-02-21) entire document
35	A	CN 208115108 U (TIANJIN DEEPFAR OCEAN TECHNOLOGY CO., LTD.) 20 November 2018 (2018-11-20) entire document
40	☒ Further documents are listed in the continuation of Box C. ☒ See patent family annex.	
45	* Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family
50	Date of the actual completion of the international search 30 December 2020	Date of mailing of the international search report 18 February 2021
55	Name and mailing address of the ISA/CN China National Intellectual Property Administration (ISA/CN) No. 6, Xitucheng Road, Jimenqiao, Haidian District, Beijing 100088 China Facsimile No. (86-10)62019451	Authorized officer Telephone No.

Form PCT/ISA/210 (second sheet) (January 2015)

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2020/092869

5

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	CN 201834198 U (WUHAN HAIWANG MECHANICAL ELECTRONIC ENGINEERING TECHNOLOGY CO., LTD.) 18 May 2011 (2011-05-18) entire document	1-7
A	CN 201211414 Y (BAI, Jinku) 25 March 2009 (2009-03-25) entire document	1-7

10

15

20

25

30

35

40

45

50

55

Form PCT/ISA/210 (second sheet) (January 2015)

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/CN2020/092869

Patent document cited in search report	Publication date (day/month/year)	Patent family member(s)	Publication date (day/month/year)
JP S4871597 U	08 September 1973	None	
CN 110758686 A	07 February 2020	CN 211391641 U	01 September 2020
CN 212386672 U	22 January 2021	CN 111591421 A	28 August 2020
WO 2011083170 A1	14 July 2011	GB 2476879 B	25 July 2012
		GB 2476879 A	13 July 2011
		GB 201000263 D0	24 February 2010
		GB 201100307 D0	23 February 2011
CN 2871376 Y	21 February 2007	AU 2005100230 A4	21 April 2005
		EP 1600369 A2	30 November 2005
		US 2005279271 A1	22 December 2005
		JP 2005335671 A	08 December 2005
		US 7000559 B2	21 February 2006
		HK 1072691 A2	02 September 2005
CN 208115108 U	20 November 2018	None	
CN 201834198 U	18 May 2011	None	
CN 201211414 Y	25 March 2009	None	

Form PCT/ISA/210 (patent family annex) (January 2015)