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(72) Inventor: **YANG, COZA Jie**
Hunghom
Hong Kong (HK)

(74) Representative: **Sun, Yiming**
HUASUN Patent- und Rechtsanwälte
Friedrichstraße 33
80801 München (DE)

(71) Applicant: **Coza International Limited Hongkong**
Hong Kong (HK)

(54) **DUAL SOURCE STARTER SYSTEM FOR AN ENGINE**

(57) A gasoline grass trimmer includes an internal combustion engine (ICE) (15), a starter system (1) configured to start the engine (15).

The present invention relates to an engine starter system (1) that can transmit external rotating force or using internal Pulling Wheel System (4, 8) generated rotational force through the 'Dual Force Clutch' (7), 'Buffering Spring' (9) and drive the 'Driving Plate' (2) to start

the (ICE) (15). The present invention states that external rotational force from electrical power driven device (5.1 and 5.2), such as power tool, can be applied through the 'External Rotating Force Connector' (5) to start up the ICE. Or if such electrical power driven device electrical rotating device is not available, the ICE can also be started by the built-in Pulling Wheel System (4, 8) of this Dual Source Starter System.

EP 3 147 494 A1

Description

THE TECHNOLOGY SCOPE

[0001] The present invention relates to internal combustion engine (ICE), outdoor power equipment powered by such engines, such as grass trimmer, lawn mower, hedge trimmer, chain saw, cut off saw, generator, high pressure cleaner, pump, etc. more specifically, the present invention relates to a starter system. That can start up the internal combustion engine (ICE) by either internal or external rotational force.

[0002] The present invention relates to start system for internal combustion engine (ICE), using either internal rotational force generated by built-in 'Pulling Wheel System' (4, 8) or applying external rotational force through the 'External Rotational Force Connector' (5).

TECHNOLOGY BACKGROUND

[0003] The Dual Source Starter System includes an 'External rotational Force Connector' (5) and 'Dual Force Clutch' (7) system (7, 7.1, 7.2, 7.3) that transmits external rotational force to start up the internal combustion engine independently. Furthermore, the 'Dual Force Clutch' (7) system (7, 7.1, 7.2, 7.3), can also start up the ICE independently by using the built-in 'Pulling Wheel System' (4, 8).

[0004] The rotational force drives through the 'Dual Force Clutch' (7) system (7, 7.1, 7.2, 7.3), to the 'Buffering Spring' (9) and then to the 'Driving Plate' (2) to start up the ICE.

[0005] The incorporation of 'External Rotational Force Connector' (5) allows an option for extra Independent ICE start up power source input. When force is applied to 'External Rotational Force Connector' (5), the 'Dual Force Clutch' (7) system (7, 7.1, 7.2, 7.3) automatically disconnects with 'Pulling Wheel System' (4, 8) to allow the ICE to start up by the external rotational force.

Invention Summary

[0006] The purpose of present invention is, an improved ICE start up system enhancing ICE start up procedure by using external rotational force

[0007] According to existing starters for ICE which requires continuous manual pulling action to 'Pulley Wheel' (4) until the ICE starts up

[0008] According to present invention, the 'Dual Force Clutch' (7) system (7, 7.1, 7.2, 7.3) is structured to allow using either internal or external force application to start up ICE and automatically idle the other source of force. Therefore, eliminate the need for a manual mode selector.

[0009] The 'Dual Force Clutch' (7) has been integrated with the 'External Rotational Force Connector' (5) transmits external rotational force to 'Buffering Spring' (9), which connected to 'Driving Plate' (2) and 'Clutch Spin-

dle', this structure has high efficiency in mechanical force transmission and much lower production cost.

[0010] The Dual Force Clutch is also connected with the pulley wheel (4), when pulling force is applied, rotational force generated transmits through the 'Dual Force Clutch' (7), to the 'Buffering Spring' (9), to the 'Driving Plate' (2) and to the clutch spindle to start up the ICE.

BRIEF DRESCRIPTION OF THE FIGURES

[0011] The disclosure will become more fully understand from following detailed description, taken in conjunction with the accompanying figures, in which:

Fig. 1: is a perspective view of a gasoline grass trimmer according to an exemplary embodiment of the invention.

Fig. 2: is a perspective view of a normal starter, pulling handle to start engine, according to an exemplary embodiment of the invention.

Fig. 3: is a perspective view of the external rotational force, generated by electrical power driven device, according to an exemplary embodiment of the invention.

Fig. 4: is a perspective view of the Dual Source Starter System, according to an exemplary embodiment of the invention.

Fig. 5: is a perspective view of the Dual Force Clutch system, according to an exemplary embodiment of the invention.

Fig. 6: is a perspective view of the exploding diagram according to an exemplary embodiment of the invention.

DETAILED DESCRIPTION

[0012] Before turning to the figures, which illustrate the exemplary embodiments in detail, it should be understood that the present application is not limited to the details or methodology set forth in the description of illustrated in the figures. It should also be understood that terminology is for purpose of description only and should not be regarded as limiting.

[0013] Referring to Fig. 1, outdoor power equipment, in the form of gasoline grass trimmer, includes an ICE (15) and the present invented starter (1), coupled to a rotary tool, such as grass trimmer, lawn mower, with a corresponding powered tool hedge trimmer, chain saw, cut off saw, generator, high pressure cleaner, pump, etc. or other tools.

[0014] Still referring to Fig. 2, the gasoline grass trimmer includes a starter system. According to an exemplary embodiment, the starter system includes a 'body' (6), a

'pulling handle' (8), 'External Rotational Force Connector' (5).

[0015] Referring to Fig. 6, 'External Rotational Force Connector' (5), is expanded from clutch, combined into an entirety part.

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[0016] The 'Buffering Spring' (9) always connected between 'Dual Force Clutch' (7) and 'Driving Plate' (2), the spring has been wired around 'Dual Force Clutch' (7), excess force generated either internally or externally therefore can be buffered.

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[0017] Referring to Fig. 3 and Fig. 4, external rotational force, which generated by electrical power driven device, transmitted through 'External Rotational Force Connector' (5), 'Dual Force Clutch' system (7, 7.1, 7.2, 7.3), 'Buffering Spring' (9), 'Driving Plate' (2), to engine, then start engine accordingly.

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[0018] Referring to Fig. 2 and Fig. 5, the Dual Source Starter System also includes existing pulling handle (8) and pulley wheel (4), the pulley wheel (4) has been clutched through clutch bracket (7.1), (7.2), (7.3), the internal rotational force generated by pulling handle, can transmit to 'Dual Force Clutch' (7) system (7, 7.1, 7.2, 7.3), 'Buffering Spring' (9), 'Driving Plate' (2), finally to start up engine independently.

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Claims

1. The Dual Source Starter System, it includes the starter body (6), which provides a dual force starting to start up an internal combustion engine (ICE). The Dual Source Starter System can start an ICE either using internal rotational force generated by pulling the pulling handle (8) or external rotational force by connecting electrical power driven device (5.1 and 5.2), such as power tool, to the 'External Rotating Force Connector' (5), through the 'Dual Force Clutch' (7) system (7, 7.1, 7.2, 7.3), 'Buffering Spring' (9) and 'Driving Plate' (2), Using this Dual Starter System, the ICE can start up independently when either internal or external rotating force is applied.
2. According to claims 1, the characteristic is, the 'External Rotating Force Connector' (5), can be connected with electrical power driven device (5.2), such as power tool, to start the ICE (1).
3. According to claims 1, the characteristic is, the 'Dual Force Clutch' (7) system (7, 7.1, 7.2, 7.3), which can start the ICE either by internal or external rotational force independently.
4. According to claims 1, the characteristic is, the 'Buffering Spring' (9), connecting between the 'Dual Force Clutch' (7) system (7, 7.1, 7.2, 7.3) and 'Driving Plate' (2), which providing a buffering in preventing excess force generated either internally or externally that can damage the Dual Source Starter System.

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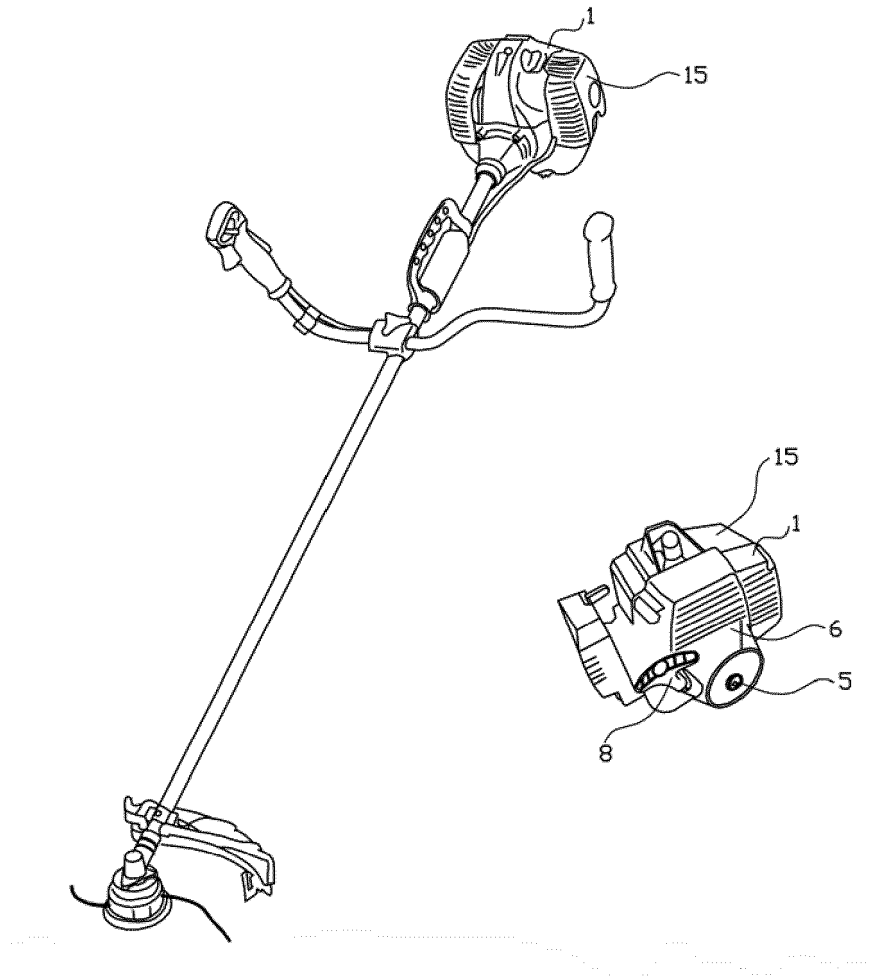


Fig. 1

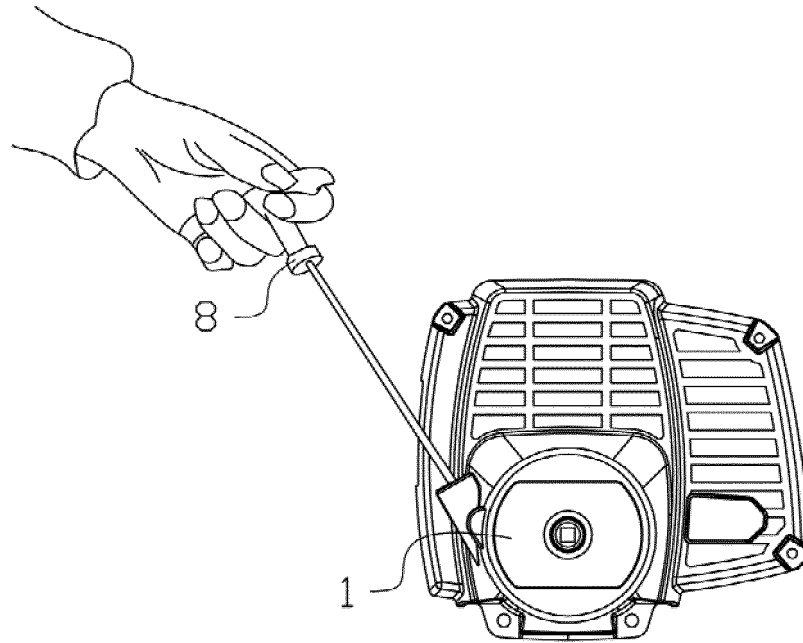


Fig. 2

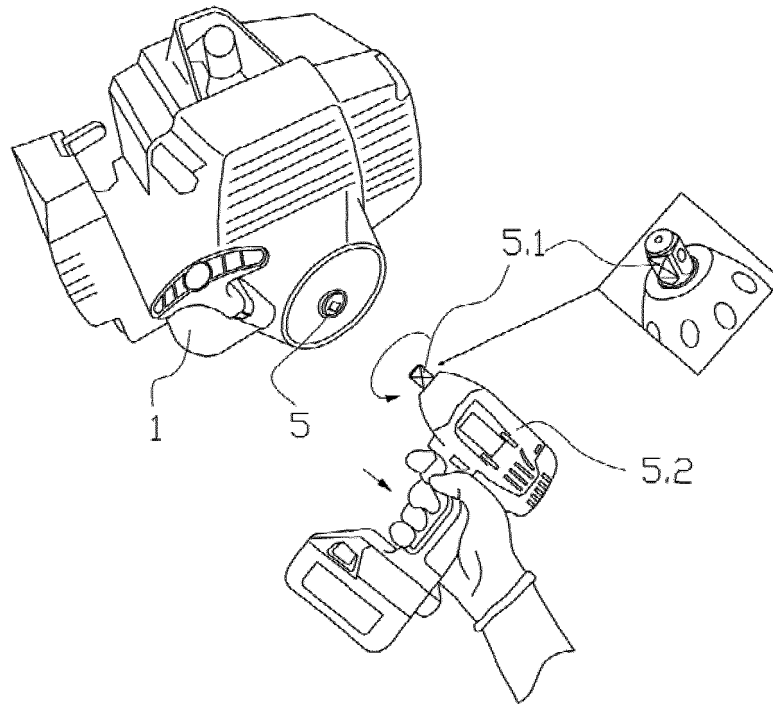


Fig. 3

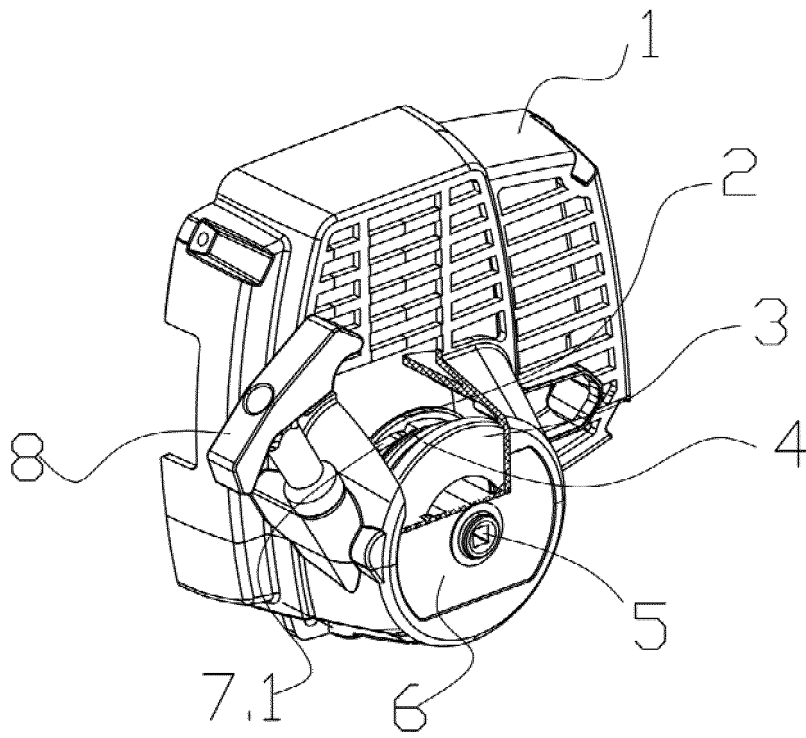


Fig. 4

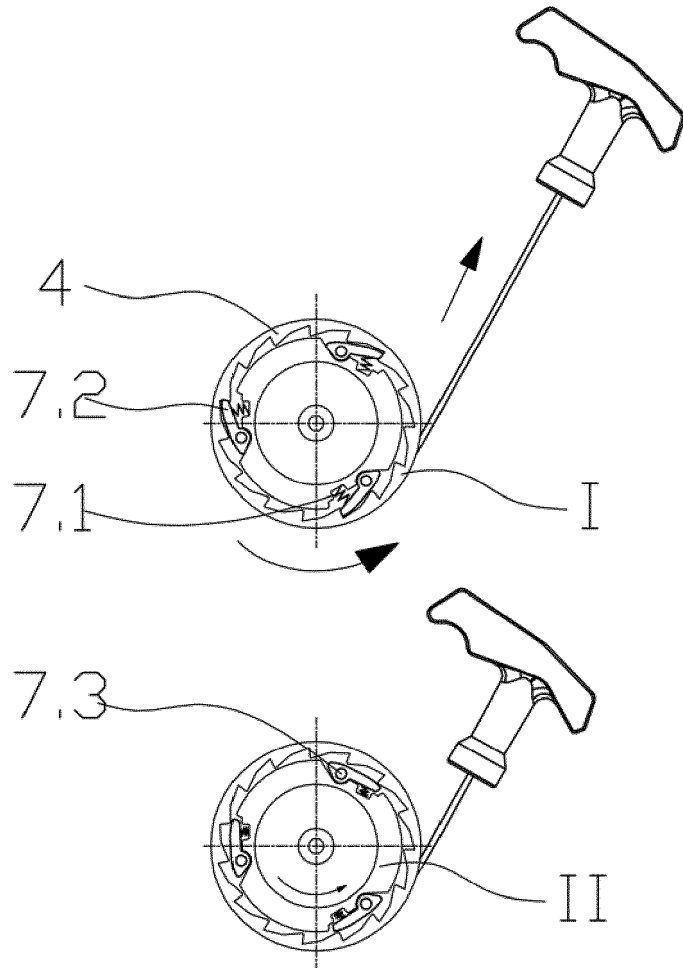


Fig. 5

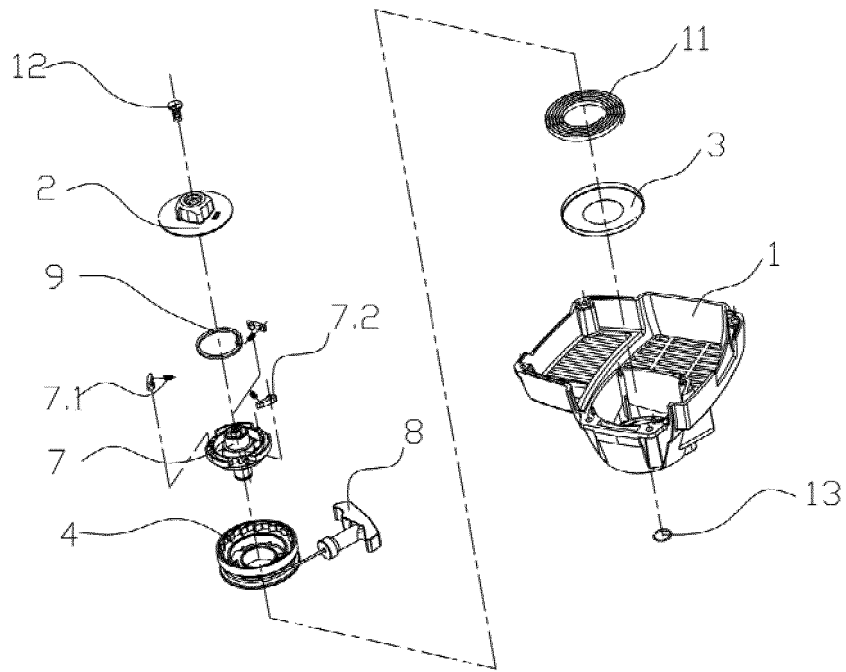


Fig. 6



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Application Number
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Place of search Munich		Date of completion of the search 23 February 2016	Examiner Ulivieri, Enrico
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