United States Patent

Bloom

[15] **3,667,199**

[45] **June 6, 1972**

[54] POWER-OPERATED LAWNMOWER WITH IMPROVED DISCHARGE MEANS

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[21] Appl. No.: **50,024**

[52] **U.S. Cl.** **56/320.2**
[51] **Int. Cl.** **A01d 35/26**
[58] **Field of Search** 56/320.2

[56] **References Cited**

UNITED STATES PATENTS

3,485,018	12/1969	Beckering et al.	56/320.2 UX
3,234,719	2/1966	Rank	56/320.2 X
2,926,478	3/1960	Jepson	56/320.2 X

FOREIGN PATENTS OR APPLICATIONS

1,000,650	8/1965	Great Britain	56/320.2

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Assistant Examiner—J. A. Oliff
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[57] **ABSTRACT**

A power-operated lawnmower has ground-engaging wheels supporting a deck housing. The deck housing encloses a plurality of rotary blades, preferably two in number. Each blade has a respective discharge channel formed within the deck housing. Each channel is preferably of the volute type and terminates in a respective lateral discharge opening. The discharge openings are formed along one side only of the deck housing, thereby providing improved safety and optimum removal of the grass cuttings.

3 Claims, 4 Drawing Figures

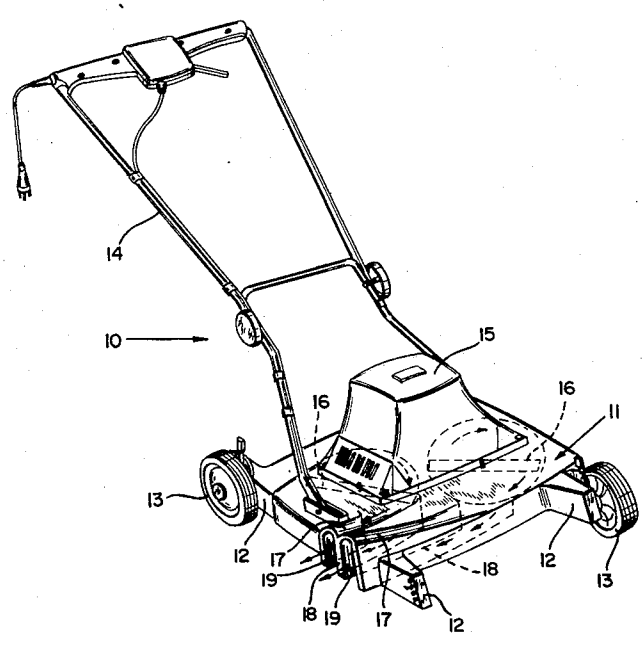


FIG. 1

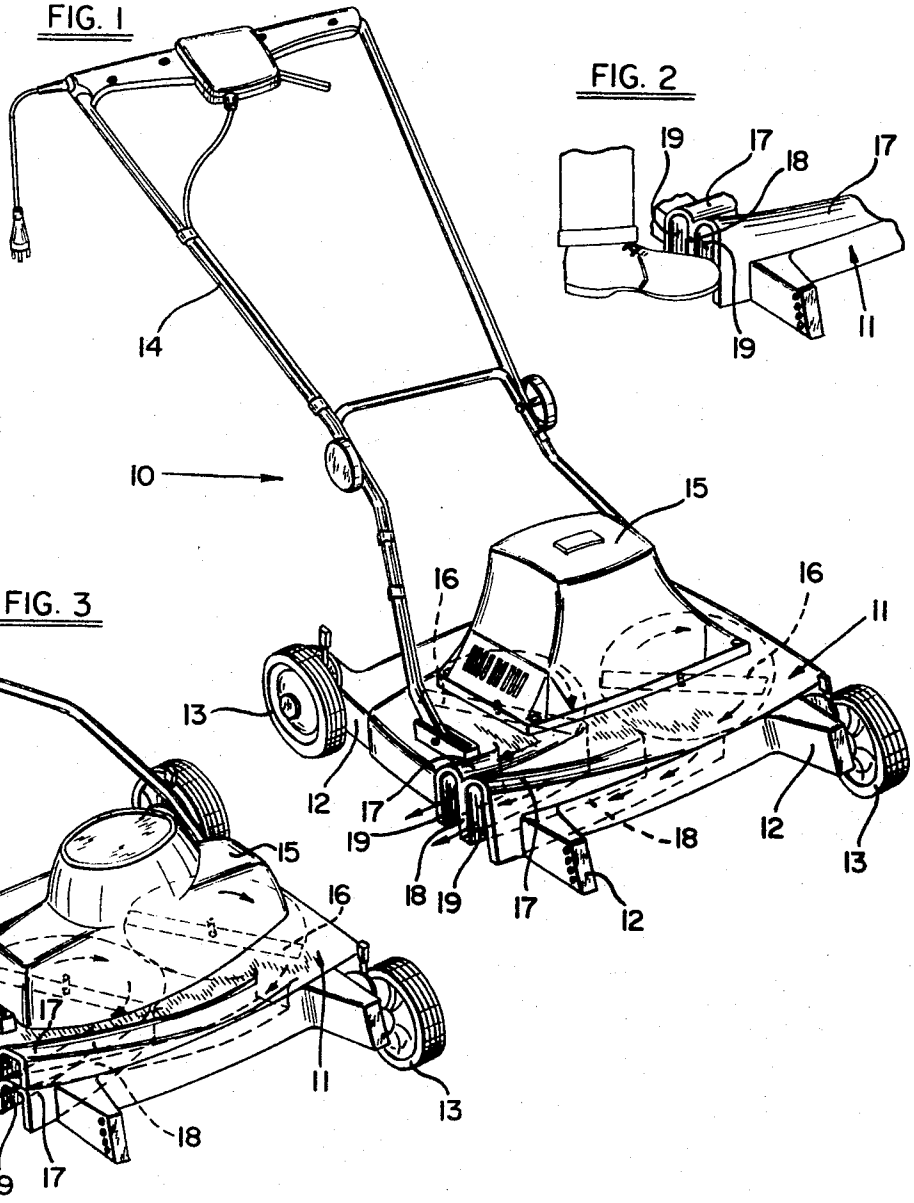
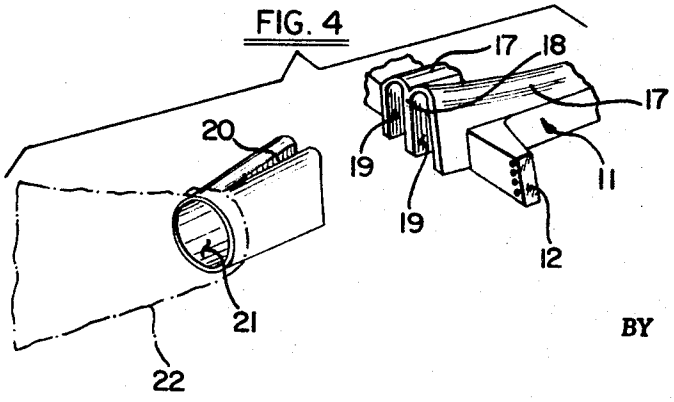


FIG. 2

FIG. 3

FIG. 4



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POWER-OPERATED LAWNMOWER WITH IMPROVED DISCHARGE MEANS

In the prior art, power-operated lawnmowers equipped with one or more rotary blades usually have been provided with a single lateral discharge opening formed along a side edge of the deck housing. In order to obtain a desired removal of the grass cuttings with reasonable efficiency, the discharge opening is made fairly large and forms the termination of a volute-type of discharge channel, the channel being formed in the deck housing in association with the rotary blade. Other power-operated lawnmowers, having a pair of rotary blades, are provided with a respective pair of discharge openings, one for each of the blade paths. These openings, which are formed tangentially of the blades, are located at the front and rear of the deck housing, respectively, which is undesirable.

In accordance with the broad teachings of the present invention, a power-operated lawnmower is provided, having a pair of rotary blades, and power means drivingly connected to the blades. The blades are enclosed by a deck housing which has respective discharge channel means formed therein, one for each of the blades. Each of the discharge channels terminates in a lateral discharge opening. These respective lateral discharge openings are formed along one side only of the deck housing.

In accordance with the further teachings of the present invention, the discharge channel means comprises volute means for efficient removal of the grass cuttings, while the deck housing includes a baffle means to prevent mixing of the air flow patterns in the volute means. The lateral discharge openings are located at the same side of the deck housing, substantially adjacent to one another, either side-by-side or stacked vertically with respect to each other. A transition member is mounted on the deck housing, laterally of the one side thereof, and communicates with the respective lateral discharge openings. The transition member has a single outlet for discharge of the cuttings into a grass-catching bag.

These and other objects of the present invention will become more apparent from a reading of the following description, taken in conjunction with the enclosed drawings, in which:

FIG. **1** is a perspective of one embodiment of the present invention, applied to a twin-blade electric lawnmower having the blades longitudinally staggered with respect to each other, and showing the blade discharge channels terminating in respective lateral discharge openings;

FIG. **2** is a portion of FIG. **1**, but showing how the user's foot is prevented from entering either of the respective lateral discharge openings, since each of said openings is smaller than the combined opening used in the prior art;

FIG. **3** is a perspective of another embodiment of the present invention, applied to a twin-blade electric lawnmower having the blade paths overlapping one another, wherein said respective lateral discharge openings are stacked vertically with respect to each other; and

FIG. **4** is a perspective of a transition member, shown in exploded relationship with a portion of the deck housing, the transition member being adapted for mounting on the deck housing over the respective lateral discharge openings, thereby communicating the openings with a grass-catching bag, the latter being shown in broken lines.

With reference to FIG. **1**, the power-operated lawnmower **10**, which may be driven by an electric motor or a gasoline engine, and which is adapted for movement in a generally longitudinal direction, generally comprises a deck housing **11**; lugs **12** integrally formed on the deck housing and having means for mounting ground-engaging wheels **13**, one of which is removed for ease of illustration; handle means **14** for controlling the unit; a housing or shroud **15** enclosing a motor (not shown); and respective blades **16**, which together with their respective paths are illustrated in broken lines.

The general arrangement of this machine is illustrated in the Beckering et al., U.S. Pat. No. 3,485,018, having a pair of blades arranged in a longitudinally staggered arrangement with respect to each other, the blades having respective cutting swaths which overlap in the direction of travel of the mower. However, it will be appreciated by those skilled in the art that the concept of the present invention is equally applicable to other arrangements or designs for rotary lawnmowers.

With this in mind, and as distinguished from the prior art, each of the blades **16** has an individual discharge channel **17** in juxtaposition or associated therewith. These discharge channels **17** are preferably formed as individual volutes having a gradually increasing cross-sectional area, and barrier or baffle means **18** is provided in the deck housing to prevent a mixing of the air flow patterns of the respective volutes. The baffle means **18** may be formed integrally with a die-cast aluminum deck housing **11**, as an internal wall, or else made as a separate piece and assembled with a stamped sheet-metal deck housing, as understood by those skilled in the art.

Each of said volute discharge channels **17** terminates in a respective lateral discharge opening **19** formed on one side only of the lawnmower deck housing **11**, the openings **19** being substantially adjacent to one another, and longitudinally between the ground-engaging wheels **13**. Since each of the blades has its own respective discharge channel **17**, the channels may be designed for an optimization of their respective air-flow patterns. This is distinguished from the prior art, wherein the volute-type patterns are mixed or merged within the deck housing and terminate in a single lateral discharge opening. As a result, the volute air-flow patterns are made more efficient, and the grass-catching ability of the overall machine is improved.

Moreover, each of the lateral discharge openings is considerably smaller than would otherwise be the case with a single, combined opening. This facilitates increased safety, since, as shown in FIG. **2**, the typical user's foot cannot enter the discharge opening in the deck housing. Moreover, the chances of a thrown object is reduced, since the object will richochet or be retarded within the respective channel.

With reference to FIG. **3**, there is illustrated a second embodiment of the present invention, as applied to a lawnmower of the type illustrated generally in the Jepson U.S. Pat. No. 2,926,478, wherein the pair of blades have circular cutting paths which overlap one another, and wherein the power means for driving the blades includes a timing means to prevent the blades from striking one another. Here, the respective discharge opening **19** are stacked vertically with respect to each other, with the baffle means **18** constituting a horizontal wall rather than the vertical wall of the first embodiment of FIG. **1**.

With reference to FIG. **4**, a transition member **20** may be suitably secured or snapped onto the deck housing **11**, laterally of the one side thereof, and over the discharge opening **19**. This transition member, which may be molded of plastic, is shown as applied to the FIG. **1** embodiment; however, it will be appreciated that a similar member may be made for the FIG. **3** embodiment of the present invention as well. The transition member **20** communicates the respective discharge openings **19** with its own single discharge outlet **21**, and hence forms the interface between the deck housing **11** and a conventional grass-catching bag **22**, the latter being illustrated in broken lines. Moreover, if desired, the transition member may be made integrally with the bag itself.

Obviously, many modifications may be made without departing from the basic spirit of the present invention; and accordingly, within the scope of the appended claims, the invention may be practiced other than has been specifically described herein.

I claim

1. A power-operated manually manipulatable lawnmower comprising ground-engaging means for moving the mower in a generally longitudinal direction, a deck housing enclosing a pair of power-driven rotary blades, the deck housing having respective discharge channels formed therein, one for each of the blades, each of the discharge channels including a volute channel overlaying a major portion of the cutting swath of a respective blade, the respective volutes being separate from

each other and having a baffle therebetween to prevent mixing of their respective air-flow patterns, thereby preventing turbulence therebetween, and thereby optimizing the respective air-flow patterns for efficient removal of the grass cuttings, such of said volute-formed channels terminating in a respective lateral discharge opening, said baffle extending to the terminus of said volute channels at said discharge openings, thereby preventing accidental insertion of an operator's limb into the cutting swaths of said blades, the respective lateral discharge openings being formed along the sides of the deck housing which is substantially at right angles to the longitudinal direction in which the mower is operated, and said respective lateral discharge openings being adjacent to one another.

2. The lawnmower of claim 1 wherein said respective lateral discharge openings are stacked vertically with respect to each other at said one side of the deck housing.

3. The lawnmower of claim 1, wherein said respective lateral discharge openings are located side-by-side along said one side of the deck housing.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,667,199 Dated June 6, 1972

Inventor(s) Leonard Bloom

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Column 2, line 43, the word "opening" should read - - openings - -.

Column 3, line 4, the word "such" should read - - each - -.

Signed and sealed this 2nd day of January 1973.

(SEAL)
Attest:

EDWARD M.FLETCHER,JR.
Attesting Officer

ROBERT GOTTSCHALK
Commissioner of Patents

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