April 28, 1931. H. E. ADAMS 1,803,160

CONVERTIBLE LAWN MOWER, CLEANER, AND VACUUM SWEEPER

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Fig. 1.

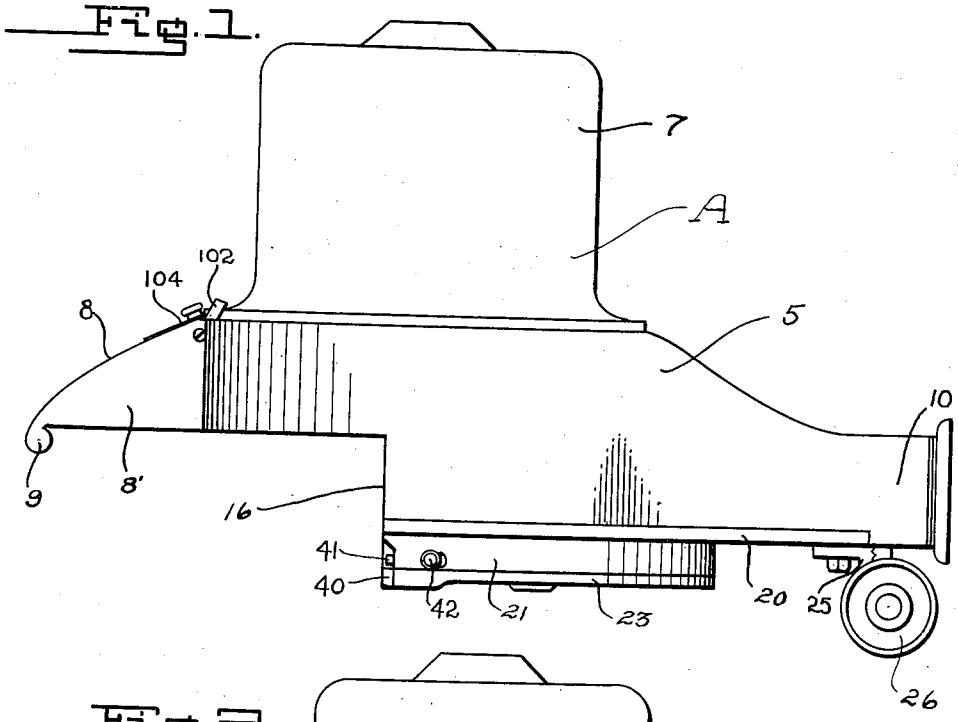
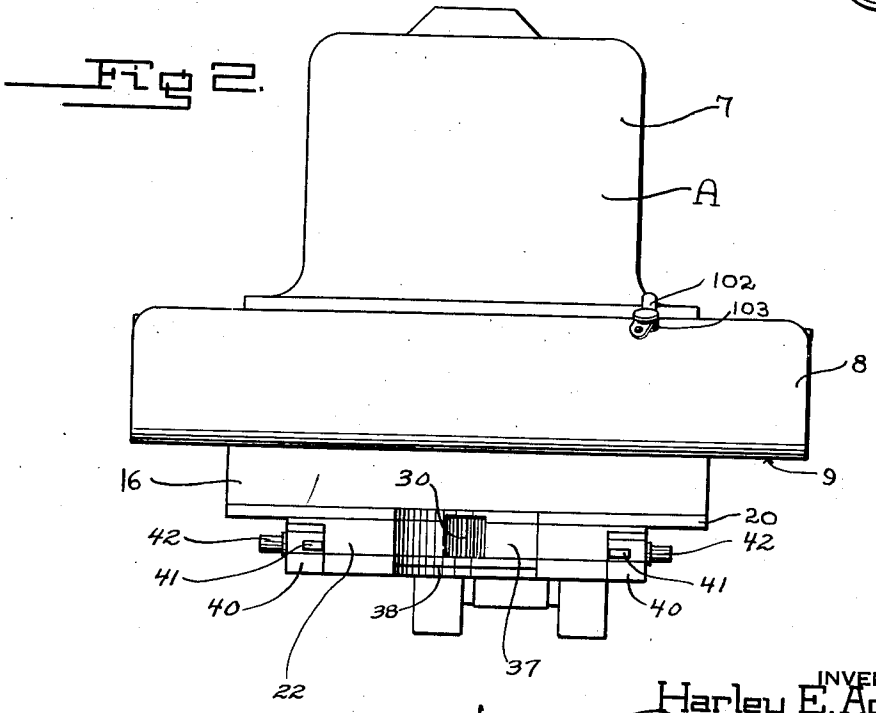


Fig 2.



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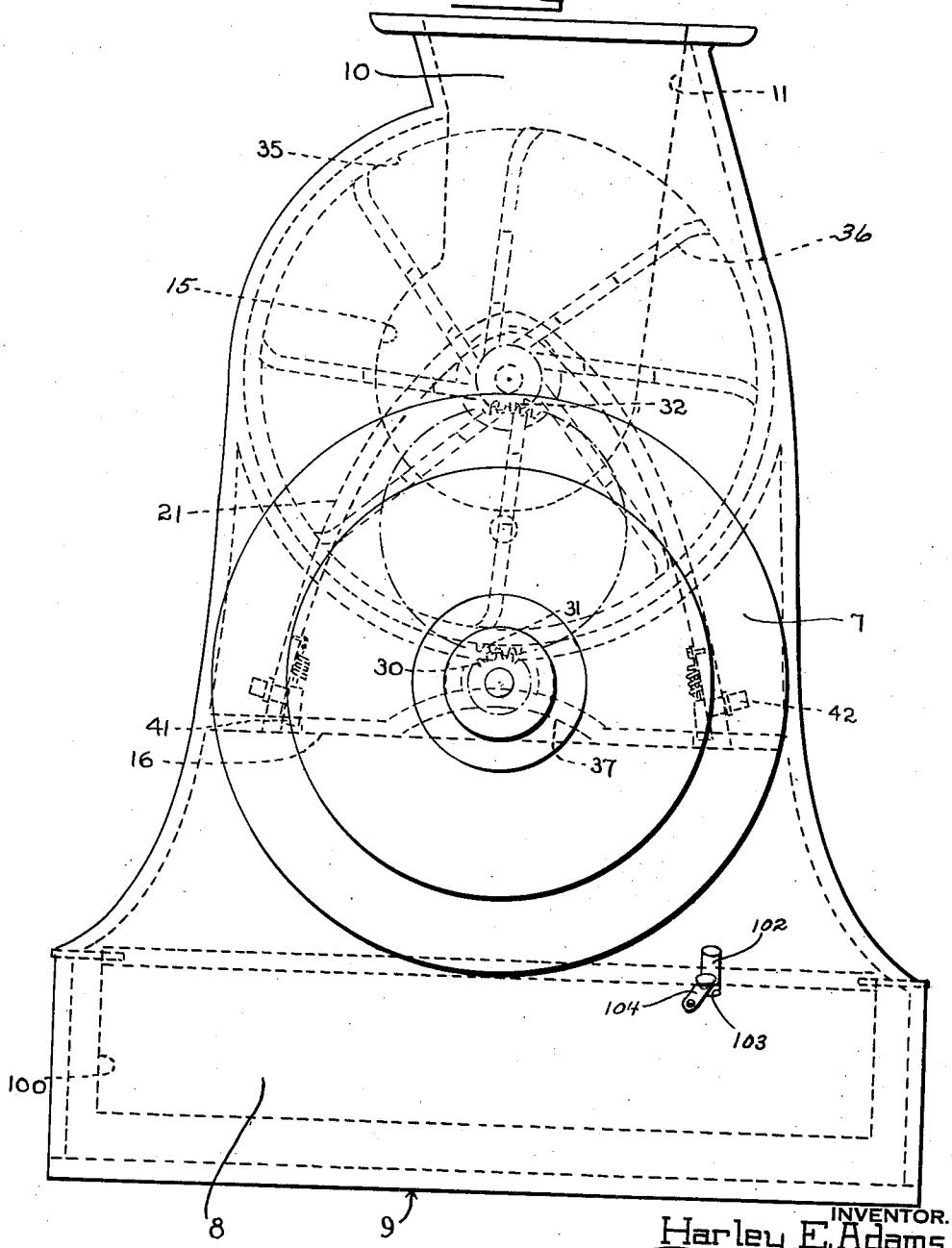
ATTORNEYS.

April 28, 1931. H. E. ADAMS 1,803,160

CONVERTIBLE LAWN MOWER, CLEANER, AND VACUUM SWEEPER

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Fig. 3.



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CONVERTIBLE LAWN MOWER, CLEANER, AND VACUUM SWEEPER

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Fig 4.

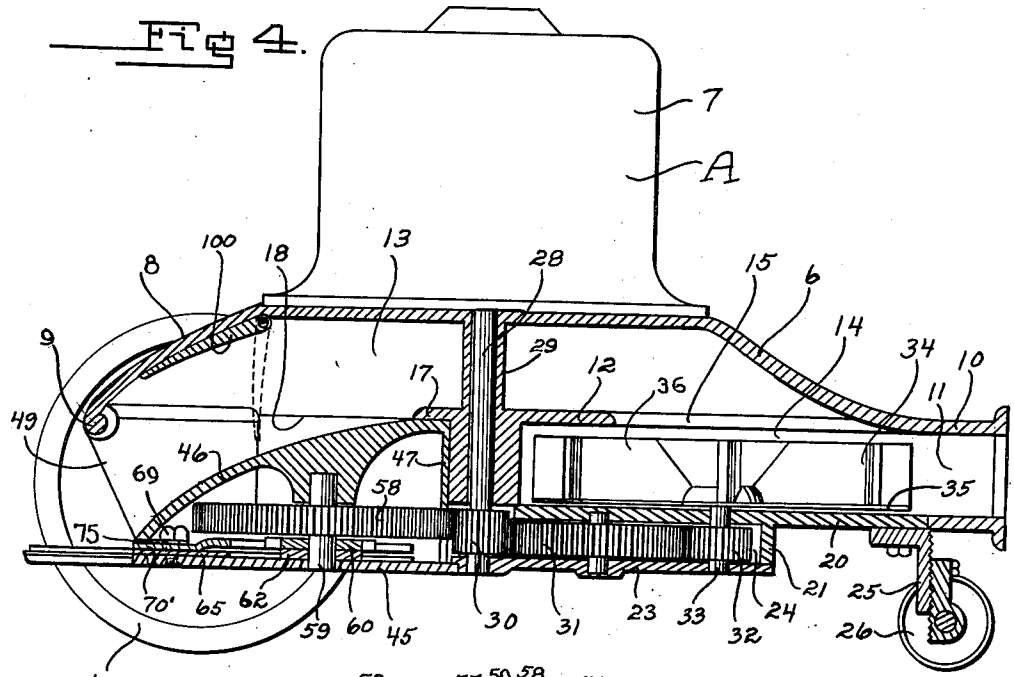
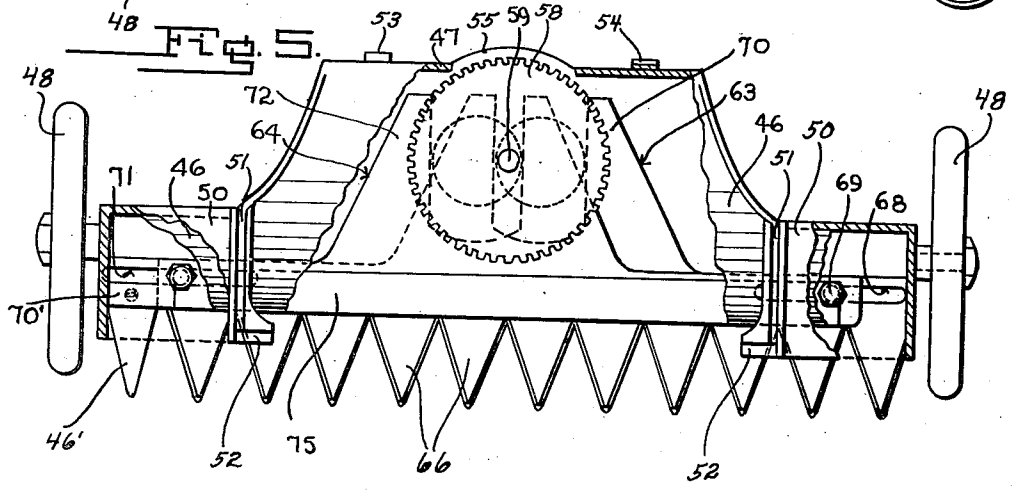


Fig 5.



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April 28, 1931. H. E. ADAMS 1,803,160

CONVERTIBLE LAWN MOWER, CLEANER, AND VACUUM SWEEPER

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Fig. 6.

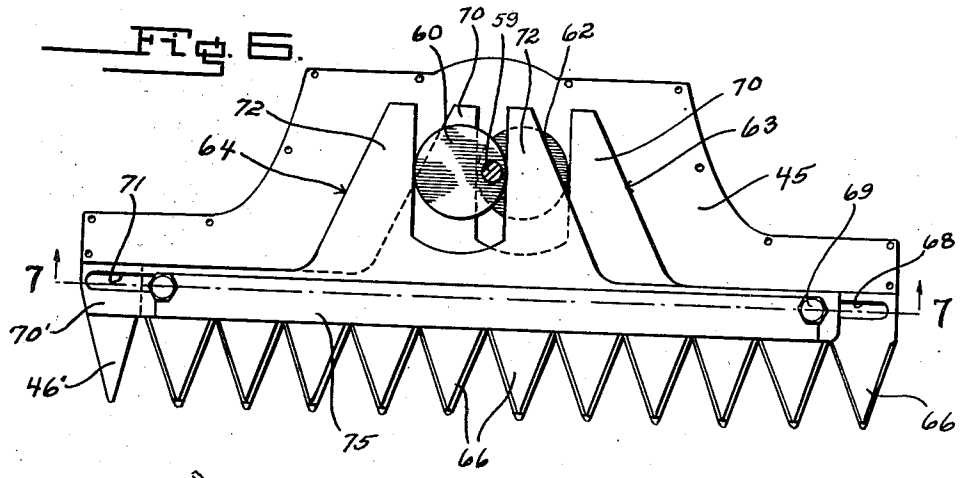


Fig. 7.

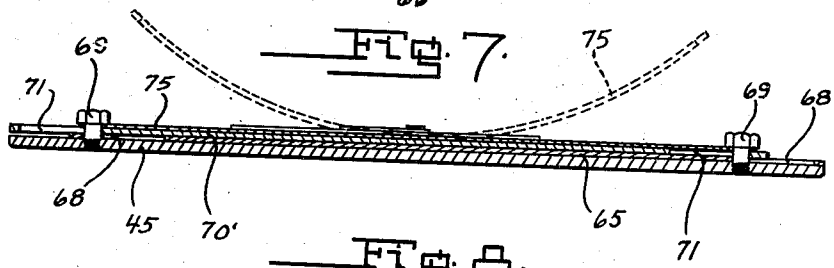
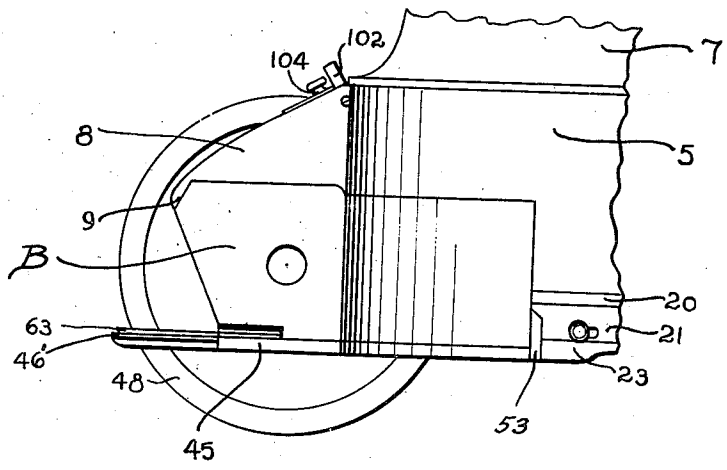


Fig. 8.



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April 28, 1931. H. E. ADAMS 1,803,160

CONVERTIBLE LAWN MOWER, CLEANER, AND VACUUM SWEEPER

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Fig. 9.

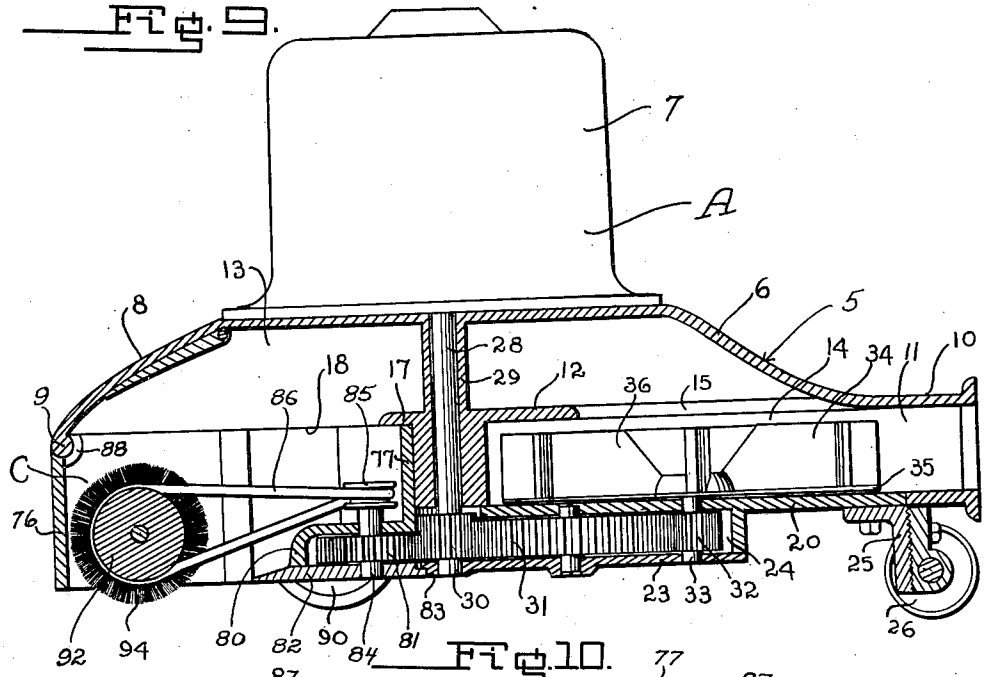
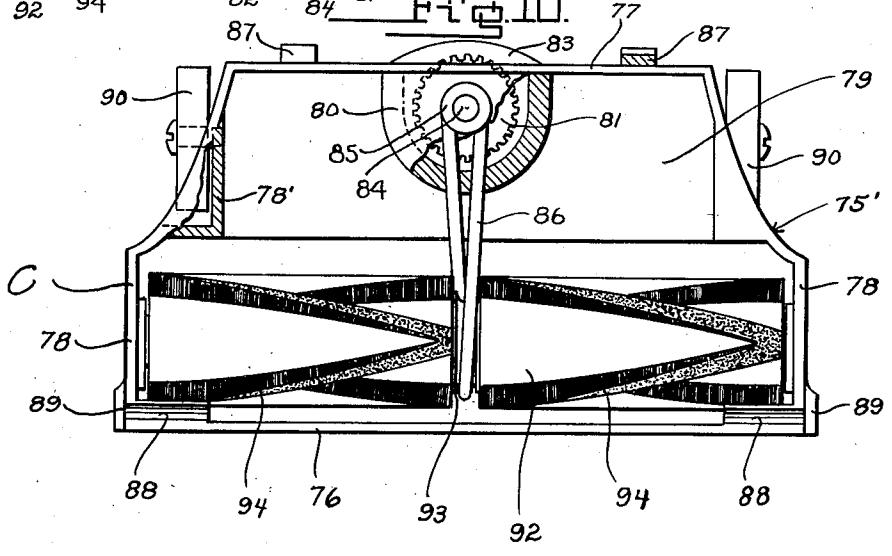


Fig. 10.



INVENTOR.
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Patented Apr. 28, 1931 1,803,160

UNITED STATES PATENT OFFICE

HARLEY E. ADAMS, OF PARKERSBURG, WEST VIRGINIA

CONVERTIBLE LAWN MOWER, CLEANER, AND VACUUM SWEEPER

Application filed August 24, 1928. Serial No. 301,725.

The present invention relates to an improved convertible lawn mower and vacuum cleaner, and the primary object of the invention is to provide a device of this character which may be readily and easily converted into either a lawn mower or vacuum cleaner through the attachment of different units.

A further object of the invention is to provide a suction device having features of construction rendering the device adaptable for attachment of different units for performing various kinds of work with the device.

A further object of the invention is to provide a device of this character embodying a novel arrangement for the fan and suction chambers whereby the material will be effectively conducted through the device for deposit in a suitable receptacle.

A still further object of the invention is to provide a device of this character embodying such features of construction as to permit of a relatively large fan chamber being provided for accommodating a relatively large suction fan with the result in obtaining a good suction through the device without requiring excessive speed of the driving motor.

A still further and important object of the invention is to provide a device of this character wherein the rotating elements and other moving parts of the mechanism will be protected against the material being gathered by the device.

A still further object of the invention resides in the novel balancing features of the motor drive shaft for preventing wear upon the bearings thereof.

A further object of the invention is to provide a convertible device of this character embodying novel attaching means for the different units whereby the units will be rigidly held in position when associated with the main housing.

A still further and important object of the invention is to provide a mower attachment of novel construction, and which unit when associated with the main housing permits of the vegetation when cut to be drawn through the main housing and gathered in a suitable receptacle associated with the discharge opening of the device.

Other objects and advantages of this invention will be apparent during the course of the following detailed description, taken in connection with the accompanying drawings, forming a part of this specification, and in which drawings,

Figure 1 is a side elevation of the main housing or casing for attachment of the various units.

Figure 2 is a front elevation of the main casing or housing.

Figure 3 is an enlarged top plan view of the main casing or housing and showing the suction fan and various other elements within the housing in their dotted positions.

Figure 4 is a central longitudinal section through the housing and the mower unit shown attached to the housing.

Figure 5 is a top plan view of the mower unit and showing the same broken away at various places for illustrating details of construction.

Figure 6 is a detail plan view illustrating features of construction of the mower units.

Figure 7 is a section on line 7—7 of Figure 6.

Figure 8 is a fragmentary side elevation of the forward portion of the main housing shown with the mower unit attached thereto.

Figure 9 is a longitudinal section through the housing and showing the sweeper units applied thereto.

Figure 10 is a top plan view of the sweeper units showing fragmentary portions broken away.

Referring to the drawings in detail, and wherein similar reference characters designate corresponding parts throughout the several views, the letter A designates the main body portion of the device with which may be detachably associated a mower unit B or the sweeper unit C.

Referring first to the main body portion A the same includes a main casing or housing 5 including an upper wall 6 which is upwardly bulged intermediate its ends with a motor housing 7 secured in any preferred manner thereto for enclosing a suitable electric motor mounted to revolve about a vertical axis. The forward portion of the cover wall 6 pro-

jects to each side of the casing and is curved downwardly to provide a hood 8 having a combined reinforcing and attaching roll or rib 9 extending along its lower forward edge and projecting below the side edges of the hood. The rear portion of the casing is constricted into a neck 10 providing a discharge port or duct 11 for opening into any suitable receptacle attached in any preferred manner to the neck 10. Extending horizontally within the casing 5 at a point substantially midway the height of the casing, is a partition plate 12 dividing the casing into an upper suction chamber 13 with a fan chamber 14 arranged beneath the rear portion of the suction chamber 13. This fan chamber 14 is of true circular formation as shown in dotted lines in Figure 3, and communicates with the discharge port 11 at the rear end of the chamber. The partition plate 12 partially overlies the chamber 14 and is provided with an opening 15 which opens into the chamber 14 at the axial center thereof. The casing 5 is provided with a flat front wall 16 which extends transversely of the casing beneath the forward edge of the partition plate 12 so that the partition plate provides a flange 17 along the upper edge of the wall 16. As will be observed, the forward edge of the partition plate 12 terminates in spaced relation rearwardly of the rib 9 and thus provides a downwardly opening suction inlet 18 which extends throughout the length of the hood 8. Thus it will be seen that material when drawn in through the opening 18 will travel rearwardly through the suction chamber 13 and then be directed downwardly into the center portion of the fan chamber 14 for exit through the discharge port 11.

Closing the lower side of the fan chamber 14 is a plate 20 conforming to the general outline of the rear portion of the casing 5. This cover plate 20 is provided with a depending substantially triangular shaped flange 21, the side walls of which converge to a point rearwardly of the axial center of the fan chamber 14 and with the flat front wall 22 extending flush with the front wall 16 of the casing 5. Closing the lower end of the triangular shaped flange or extension 21 is a cover plate 23 for providing a substantially flat gear compartment 24 arranged beneath the forward portion of the fan chamber 14. The rear portion of the plate 20 may carry an adjustable bracket 25 upon which are mounted suitable ground engaging wheels 26 acting as a support for the rear portion of the casing.

The motor shaft 28 of the motor contained in the casing 7 extends vertically through a tube 29 arranged to extend vertically through the suction chamber 13, and has its lower end journalled in the plate 23 of the rear compartment 24. The tube or sleeve 29 is preferably cast as an integral part of the casing 5 and it will therefore be seen that the motor shaft 28 is fully protected against dirt and foreign matter being drawn through the suction chamber 13. This protection against dust and dirt entering the bearings of the motor will prevent wearing of the motor bearings as in the present type of suction cleaners and wherein the motor bearings are subjected to the dirt being drawn through the device.

Mounted adjacent the lower end of the drive shaft 28 within the forward portion of the gear compartment 24 is a drive gear 30 which meshes with a larger idler gear 31 mounted in the gear compartment 24 rearwardly of the shaft 28. The idler gear 31 meshes with a gear 32 rigidly mounted upon a fan shaft 33 journaled vertically in the plates 20 and 23 at the axial center of the fan chamber 14.

Mounted upon the upper end of the shaft 33 is a fan 34 of improved construction and embodying disc-like plate 35 from the upper face of which projects radially extending blades or fins 36. These blades or fins 36 extend tangentially of a circle concentric to the axis of the disc 35 as shown in Figure 3 and have their outer ends slightly curved as is also shown by dotted lines in Figure 3. The blades are of greatest height at their ends adjacent the peripheral edge of the disc 35 and have their medial or inner portions tapering toward the disc so that in effect a pocket is formed at the center of the fan directly beneath the opening 15 in the partition plate 12. The material drawn through the suction chamber 13 will be directed downwardly through the opening 15 upon the center of the fan 34 and through centrifugal action of the fan be thrown thru the discharge port 11. The disc 35 will receive the material entering the opening 15 and allow for the blades to effectively direct the material through the discharge port. With the arrangement of the gears 30, 31 and 32 it will be seen that the gears are also protected from grit and dirt as is the motor shaft 28. By observing Figures 3 and 4 it will be seen that the fan shaft 33 is mounted in a line directly to the rear of the motor shaft 28.

A concavity 37 is provided in the front face of the gear compartment wall 22, and this concavity or arcuate shaped recess preferably extends also in the forward edge of the plates 20 and 23 as shown in Figure 2. The lower portion of the concavity in the forward edge of the plate 23 is recessed as at 38 in Figure 2 to provide a shoulder for a purpose which will be subsequently set forth. The wall 22 is provided in the concavity 37 with an opening thru which a portion of the drive gear 30 projects for a distance at least equal to the width of the teeth on the gear.

Provided at each end of the wall 22 are notches 40 which extend to the lower edge of

the plate 23. Projecting into each of the notches 40 is a spring ejected latch 41 which may be retracted by means of knobs 42 having sliding movement in slots provided in the side walls of the flange 21. By sliding the knobs rearwardly the ends of the latches 41 may be retracted from positions projecting into the notches 40. These spring latches 41 serve as means for detachably connecting either of the units B or C in operative relation upon the main body portion A. It will readily be apparent the object in so having the casing provided with the removable bottom plate 20, since such will permit of ready and easy assembling of the fan 34 within the fan chamber 14 and will permit of the upper portion of the casing being easily cast as an integral structure.

Some of the advantages to be gained in the construction of the main body portion A as shown, are that the arrangement will permit of relatively large suction and fan chambers without necessarily increasing the overall height of the casing, and that the arrangement permits of a free passage of the grass, dirt, or other material, since the arrangement of the chambers 13 and 14 provides but a slightly curved passageway thru the device from the suction inlet to the discharge opening. The arrangement further eliminates the motor shaft from the center of the fan and fan chamber thus allowing full action of the fan, and relieves pressure on the motor bearings by providing a third bearing at the bottom of the motor shaft in the cover plate 23. The construction further permits of a suitable pocket being provided beneath the forward portion of the casing for attachment of various units for performing different kinds of work such as the mower unit B and the sweeper unit C.

Referring now to the novel construction of the mower unit B for detachable connection with the main body portion A, the same is of the reciprocating sickle bar type and is intended to be driven by the motor operating the suction fan 34. The mower unit B includes a flat base plate 45 to the forward edge of which is secured a number of guard fingers 46′ which may be independently secured to the plate for allowing ready replacement of the fingers. Supported upon the base plate 45 is an inclined guide plate 46 having a straight rear wall 47 engaging at its lower edge the rear portion of the base plate. This plate 46 provides a chamber for containing the driving mechanism for the cutter units. The ends of the mower unit are adapted to receive suitable wheels 48 which may be connected to the upstanding end walls forming closures for each end of the mouth 49. The mower unit is of greater width than that of the hood 8, and cover plates 50 extend from the ends of the unit inwardly for closing the inlet opening beyond the ends of the hood 8. The inner ends of the cover plates 50 are provided with upstanding ribs forming channels 51 into which the lower edges of the end walls 8′ of the hood 8 engage when the mower attachment is associated with the body portion A. At the forward end of the channels 51, the cover plates are provided with semi-circular shaped pockets 52 which engage the ends of the roll 9 for detachably coupling the forward portion of the mower unit to the forward edge of the hood 8 and allowing swinging movement of the unit into position beneath the suction inlet 18. Projecting rearwardly from the lower portion of the rear casing wall 47 of the mower unit is a pair of lugs or projections 53 having beveled upper edges as shown in Figure 8, and each being provided with a slot 54 extending transversely of the lugs. These lugs 53 are intended when the mower unit is applied to the casing 5, to engage in the notches 40 with the latches 41 engaging in the slots 54 whereby the rear portion of the mower unit is rigidly secured in position. The intermediate portion of the rear edge of the plate 45 is outwardly arcuated as at 55 in Figure 5, and this arcuate projection 55 engages the shoulder 38 on the cover plate 23 for further anchoring of the rear portion of the mower unit and also closing the lower portion of the concavity 37 provided in the wall 22. With the arcuate pocket 52 hooked upon the roll 9, and the latches 41 engaging in the slots 54 of the lugs 53 it will be seen that the mower unit will be rigidly but detachably held in position beneath the suction inlet 18 with the wheels 48 serving to support the forward portion of the device.

Rotatably mounted upon a vertical axis within the rearwardly projecting central portion of the unit is a mower drive gear 58, the lower end of the shaft of which is journalled in the base plate 45 while the upper end of the shaft is journalled in a bearing forming bracket projecting below the inclined guide plate 46. This horizontally mounted gear 58 has a portion of its peripheral teeth projecting through an opening in the rear wall 47 so that the teeth of the gear may mesh with the pinion 30 carried by the motor drive shaft 28. It will readily be seen that the object in so providing the concavity 37 in the wall 27 is to permit of ready upward movement of the projecting portion of the gear 58 so that the same may readily mesh with the teeth of the gear 30. When the gears 30 and 58 are so meshing the lower portion of the concavity 37 is fully closed by the arcuate projection 55 provided at the rear edge of the base plate 45 so that no dirt or foreign matter may interfere with operation of the gears. Rigidly carried by the shaft upon which the gear 58 is rigidly mounted, and arranged beneath the gear, is

a pair of upper and lower drive discs 60 and 62 respectively, and which discs are mounted eccentrically upon the shaft 59 so that the discs extend in direct opposite directions diametrically of the shaft as clearly shown in Figure 6. These discs or eccentrics 60 and 62 act as operating means for cutter and balancing plates 63 and 64 respectively.

Referring first to the specific formation of the cutter plate 63, the same includes an elongated flat body portion 65 provided along its forward edge with a series of triangular shaped blades 66 of a number one less the number of guard fingers 46′ so that the body portion 65 is of a length shorter than the length of the guard finger carrying base plate 45 for a distance equal to the width of one guard finger. This length of the body portion 65 will permit of reciprocatory movement of the cutter plate for a distance equal to the width of one of the blades 65 without the cutter plate projecting beyond the end walls of the mower unit when moved in either direction. Each end portion of the body portion 65 is provided with a longitudinally formed guide slot 68 through which extend stud bolts 69 which are threaded into the base plate 45. Projecting rearwardly from the central portion of the body portion 65, and in a like plane therewith is a bifurcated extension providing a pair of plate-like arms 70 having parallel spaced apart confronting edges which are engaged by the peripheral edge of the eccentric 62 whereby a reciprocating motion is imparted to the cutter plate upon rotation of the shaft 59.

It may here be well to state that the guard fingers 46′ and co-acting blades 66 project beyond the forward edge of the inclined guide plate 46 and are arranged to extend throughout the length of the lower portion of the mouth 49.

Referring now to the plate 64, and which plate is intended to act as a counterbalancing means for the reciprocating cutter plate 63, the same includes an elongated body portion 70′ having guide slots 71 provided adjacent each end thereof and through which the shanks of the bolts 69 extend for retaining the body portion 70′ in sliding overlying relation to the cutter plate body portion 65. Projecting rearwardly from the central portion of the body portion 70′ is a bifurcated extension providing a pair of spaced arms 72 having straight parallel inner edges to be engaged by the upper eccentric 60 for imparting reciprocatory motion to the balancing plate upon rotation of the shaft 59. This balancing plate as will be observed has the arms 72 offset upwardly slightly for proper engagement by the eccentric 60 and also for eliminating possible contact of the arms 72 with the companion arms 70 when being reciprocated. The balancing plate 64 is not provided with any teeth, and therefore the plate is formed considerably thicker so that the weight of the balancing plate will balance the weight of the cutter plate carrying the blades 66. As will be observed, the eccentrics 60 and 62 act to reciprocate the plates 63 and 64 in unison in opposite directions, and by reason of providing the plate 64 the sickle plate is counterbalanced so that practically no vibration is caused during operation of the mower unit. The eccentrics 60 and 62 are of like diameter, so that the plates 63 and 64 will be moved equal distances in each direction by the eccentrics, and longitudinal movement of the plate body portions is permitted through provision of the slots 68 and 71.

A flat tension spring 75 is provided for retaining the balance plate in sliding contact with the cutter plate 63 and the cutter plate in sliding contact with the upper surface of the plate 45, so that the blades 66 will co-act efficiently for cutting vegetation with the fingers 46′. This spring 75 which extends across the upper surface of the body portion 70′ of the balance plate 64 has a normal tendency to arch upwardly at its end as shown in dotted lines in Figure 7, and when the spring is disposed in position with its ends engaging beneath the heads of the bolts 69 it will be seen that the spring will act to retain the plates 63 and 64 in assembled relation and in frictional contact with one another upon the base plate 45.

By observing Figure 3 it will be seen that the mower unit drive gear 58 meshes with the drive shaft pinion 30 at a point diametrically opposite to the point at which the idler gear 31 engages the pinion so that power from the drive shaft is taken from diametrically opposite sides of the shaft with the result that the motor armature and shaft are practically in a floating state, and which will reduces the wear on the motor bearings and thereby materially adding life to the machine as a whole.

When the mower attachment is applied to the main casing 5, the projecting ends of the mower attachment are closed at all sides except the front of the unit so that material entering the ends of the unit will be directed inwardly and then rearwardly over the inclined guide plate 46 into the suction chamber 13.

In attaching the mower unit to the body portion A it will be necessary to position the unit beneath the suction inlet 18 with the arcuate pockets 52 receiving the roll 9 and then the unit swung upwardly about the roll as a pivot until the rear upper face of the inclined guide plate 46 engages beneath the flange 17 formed at the forward end of the partition plate 12. When so swinging the unit into position the inclined upper end of the lugs 53 will depress the latches 41 so that the lugs are received in the recesses 40 with

the latches 41 engaging in the slots 54 whereby the unit is held in position at its forward edge by the roll 9 and at its rear edge by the latches 41. When the device is in operation, it will be seen that the motor will operate for simultaneously operating the mower unit and also the suction fan.

The object in so providing but one reciprocating set of cutter blades, with a counterbalancing plate for the blades, is that in actual practice and use of one of the devices it has been found that when employing two sets of co-acting reciprocating cutter blades that the grass being cut is "laid" by the double blade owing to the speed required for double cutting blades. It has been found that by employing a single set of cutting blades operating at a slower speed, that the grass is cut in a neat manner and is not merely laid down by the mower.

Referring now to the sweeper unit C, the same is of such construction as to permit of the same being readily detachably associated with the main portion A in place of the mower unit B when it is desired to use the device as an ordinary vacuum cleaner. The unit C includes a frame 75′ embodying front and rear walls 76 and 77 respectively and end walls 78 which are offset inwardly adjacent the rear wall 77. Extending across the inwardly offset end wall sections 78′ is a bottom plate 79, the rear edge of which connects with the rear wall 77 so that the plate 79 forms a shelf across the lower rear portion of the sweeper frame. The central portion of the plate 79 is provided with an upwardly offset boss 80 forming a chamber for receiving a sweeper drive gear 81. A cover plate 82 is removably connected beneath the chamber forming boss 80 for enclosing the gear 81, and this plate 82 is provided with an arcuate extension 83 which projects rearwardly of the wall 77 for engaging the shoulder 38 of the main body portion cover plate 23 in a like manner as does the extension 55 of the mower unit. The shaft 84 of the gear 81 is journalled in the plate 82 and boss 80 and carries at its upper end a sheave 85 about which is trained a suitable belt 86. Carried by the rear wall 77 are lugs 87 being transversely slotted for latching engagement with the latches 41. Provided adjacent each end and at the upper edge of the front wall 76, are arcuate shaped pockets 88 being closed at their outer ends by the projections 89 which extend beyond the outer faces of the end walls 78. These arcuate shaped pockets 88 are intended to receive the roll 9 with the ends of the roll engaging the projections 89 so that the unit is held against movement longitudinally of the roll.

The inwardly offset wall portions 78′ carry suitable ground engaging wheels 90 serving to support the forward portion of the device when using the sweeper unit. When the sweeper unit is applied to the main body portion A, the upper edges of the end walls 78 engage the lower edges of the side walls of the casing 5 forwardly of the front casing wall 16, while the upper edge of the rear wall 77 engages beneath the flange 17 provided at the forward edge of the plate 12.

Revolubly mounted in the end walls 78 is a brush of novel construction embodying a brush cylinder 92 provided with a circumferentially grooved medial portion 93 for receiving the belt 86 whereby the brush will be rotated. Arranged in V-shaped formation at each side of the groove 93 are rows of bristles 94, and which bristles act to sweep in two directions as the brush is rotated. With the device in operation, the brush will act to sweep the surface over which the device is being operated, while the fan 34 will create a suction drawing the dirt through the suction chamber 13. A portion of the gear 81, of course, projects through an opening in the rear frame wall 77 for meshing with the drive pinion 30.

In actual use of the device as a mower it has been found that when cutting relatively high grass or other vegetation that such has a tendency to clog in the suction chamber and fan chamber and for this reason it has been found desirable to provide means for cutting off the suction through the suction chamber while cutting high grass or other vegetation. For this purpose a pivotally hung shutter 100 has been provided for cutting off the suction through the chamber 13, and this shutter is in the form of an elongated transversely arcuated plate which is pivotally hung adjacent its upper edge in the side walls of the casing 5 immediately beneath the rear of the hood 8. This shutter plate 100 when in an elevated or inoperative position rests flat upon the arcuate upper wall of the hood 8, and is of such width that when lowered the free edge of the plate will engage the arched guide plate 46, as shown in dotted lines in Figure 4, while the ends of the plate will engage the inner surface of the side walls of the casing 5 so that suction through the chamber 13 is cut off. An operating means is provided for opening and closing the shutter, and this means preferably includes a lever 102 which extends through a slot 103 provided in the upper side of the hood 8 whereby swinging movement of the lever 102 will impart swinging movement to the plate 100. A pivoted keeper 104 mounted upon the upper side of the hood 8 may be swung into the path of movement of the lever 102 for holding the lever at one end of the slot 103 and retaining the shutter plate in its inoperative position beneath the hood. With the shutter 100 in a closed position it will be seen that suction through the chamber 13 will be cut off and tall grass or other vegetation being cut will not be drawn into the mouth 49.

It will be noted that each of the units or attachments B and C are provided with ground engaging wheels, thus eliminating the necessity of substituting different wheels when the different units are to be used. It will also be noted that the latches 41—42 are carried by the main body portion A, and this eliminates the necessity of providing a set of latches for each of the attachments.

From the foregoing description it will be apparent that a novel and improved construction for convertible devices of this character has been provided which will render the device a useful and efficient household article in that the same may be readily converted for accomplishing different classes of work. It will also be apparent that a novel arrangement has been provided wherein the bearings will be protected against grit and dirt, thus materially increasing the life of the device. It will further be apparent that a novel arrangement of the suction and fan chambers has been provided whereby relatively large chambers may be formed without materially increasing the over-all height of the main housing or casing, and which provision of a large fan chamber will permit of the fan being operated at a slower rate of speed for producing the desired suction. It will still further be apparent that a novel arrangement has been provided wherein the motor drive shaft will be practically balanced by reason of taking power from diametrically opposite sides of the drive shaft pinion.

Changes in the shape, size, and arrangement of parts may be made to the form of invention herein shown and described, without departing from the spirit of the invention or the scope of the following claims.

I claim:

1. A convertible device of the class described comprising a casing provided with a suction chamber and a fan chamber beneath the rear end of the suction chamber in communication therewith and having an outlet opening through the rear of the casing, said suction chamber at its forward end opening downwardly, a fan rotatable in the fan chamber, a motor mounted upon the upper side of the casing and including a vertical drive shaft extending through the suction chamber forwardly of the fan chamber, a pinion carried by the lower end of the drive shaft, gear means meshing with the pinion for imparting rotation to the fan, and a work performing unit detachably associated with the casing beneath the forward end of the suction chamber and including a driving gear for meshing with the pinion of the drive shaft when the unit is applied to the casing.

2. In a device of the class described comprising a main casing provided with a suction chamber and a fan chamber beneath the rear end of the suction chamber in communication therewith and having an outlet opening, a fan rotatable in the fan chamber, a motor mounted upon the upper side of the casing and including a drive shaft extending vertically within a tubular casing through the suction chamber to a location beneath the fan chamber forwardly thereof, a pinion carried by the lower end of the drive shaft, gear means arranged beneath the fan chamber and meshing with said pinion for rotating said fan, a detachable work performing unit including a drive gear, and means for detachably coupling the unit with the forward portion of the suction chamber with the drive gear thereof meshing with said pinion of the drive shaft.

3. A device of the class described comprising a casing having an upper suction chamber and a fan chamber beneath the rear portion of the suction chamber in communication therewith and having an outlet passageway, a tube extending vertically through the suction chamber forwardly of the fan chamber, a fan rotatable in the fan chamber, a motor mounted upon the upper side of the casing and having its shaft extending downwardly through said tube to a location below the fan chamber, a pinion carried by the lower end of the shaft, gear means beneath the fan chamber and meshing with said pinion for rotating said fan, a work performing unit including a drive gear, and means for detachably coupling the unit in position beneath the forward portion of the suction chamber with the drive gear in meshing relation with the motor shaft pinion.

4. A device of the class described comprising a casing having an upper suction chamber and a fan chamber beneath the rear portion of the suction chamber in communication therewith and having an outlet passageway, a fan rotatable in the fan chamber, a motor mounted upon the upper side of the casing and having its shaft extending vertically downwardly thru the suction chamber forwardly of the fan chamber, a pinion carried by the lower end of the shaft, gear means beneath the fan chamber for rotating the fan and including an idler gear engaging the pinion at the rear of the shaft, and a work performing unit arranged beneath the forward portion of the suction chamber forwardly of said shaft and including a drive gear for meshing with the motor shaft pinion at a location diametrically opposite the point at which the idler gear engages the pinion.

5. A device of the class described comprising a casing having an upper suction chamber and a fan chamber beneath the rear portion of the suction chamber in communication therewith and having an outlet passageway, a fan rotatable in the fan chamber upon a shaft projecting beneath the casing, a pinion on the fan shaft, a motor mounted upon the upper side of the casing and having its shaft extending downwardly through the suction

chamber and below the fan chamber at the forward side thereof, a pinion on the motor shaft, an idler gear meshing with the pinions on the motor and fan shaft, a working unit arranged beneath the forward portion of the suction chamber and including a driving gear for meshing with the motor shaft pinion, and means for detachably securing the working unit in a position beneath the forward portion of the casing.

6. A device of the class described comprising a main casing having an upper suction chamber and a fan chamber beneath the rear portion of the suction chamber and having an outlet passageway thru the rear of the casing, a partition plate between the chambers and having an opening forming a communication between the suction chamber and center of the fan chamber, a fan rotatable in the fan chamber including a base disc and radial blades projecting upwardly from the disc, a motor mounted upon the casing and having its shaft extending through the suction chamber forwardly of the fan chamber, means for rotating the fan from the lower portion of the motor shaft, and a working unit arranged beneath the forward portion of the suction chamber forwardly of the fan chamber and operable also by the motor shaft whereby the unit is operated upon operation of the fan.

7. A device of the class described comprising a casing having an upper suction chamber and a fan chamber beneath the rear portion of the suction chamber in communication therewith and having an outlet passageway opening through the rear of the casing, said casing along its forward edge being provided with a cylindrical rib defining the forward margin of the suction inlet for the suction chamber, a fan rotatable in the fan chamber, a working unit having arcuate pockets at its forward portion for interfitting with said rib for removably supporting the forward portion of the unit upon the casing beneath the forward portion of the suction chamber, latch means carried by the casing and releasably engageable with the rear portion of the unit for retaining the unit in coupled relation to the casing, a motor mounted upon the casing, and means for operating the fan and said unit from the motor.

8. A device of the class described comprising a casing provided with an upper suction chamber and a fan chamber beneath the rear portion of the suction chamber in communication therewith and having an outlet opening at the rear of the casing, a fan rotatable in the fan chamber, a detachable work performing unit having interfitting connection at its forward portion with the forward end of the casing beneath the forward end of the suction chamber, spring pressed latches carried by the casing for interlocking engagement with the rear portion of the work performing unit, a motor mounted upon the casing and including a drive shaft, and means for imparting movement to the fan and said unit from the drive shaft.

9. A device of the class described comprising a main casing having an upper suction chamber and a fan chamber beneath the rear portion of the suction chamber in communication therewith and having an outlet opening, a fan rotatable in the fan chamber, adjustable ground engaging wheels for supporting the rear portion of the casing, a work performing unit detachably associated with the casing beneath the forward portion of the suction chamber, ground engaging wheels carried by the unit for supporting the forward portion of the device, a motor carried by the casing and including a shaft extending downwardly through the casing, and means for operating both the fan and said unit from the motor shaft.

10. In suction apparatus, a casing having an upper suction chamber and a fan chamber beneath the rear portion of the suction chamber and having an outlet passageway, said suction chamber forwardly of the fan chamber opening downwardly to provide a suction inlet, a partition plate arranged over the fan chamber and having an opening forming communication between said chambers at the axial portion of the fan chamber, a fan rotatable in the fan chamber for creating a suction through the suction chamber, a tube extending vertically through the suction chamber forwardly of the fan chamber, a motor mounted upon the upper side of the casing and including a shaft extending downwardly through said tube to a location below the fan chamber, and gear means arranged beneath the fan chamber for imparting rotation to the fan from the motor shaft.

11. In a suction lawn mower, a mower unit including a base plate, guide fingers arranged along the forward edge of the base plate, a drive gear rotatable above the base plate, oppositely disposed eccentrics mounted in superposed relation upon the shaft for the drive gear, a sickle plate mounted for reciprocatory movement on the base plate including blades for co-acting with the guard fingers and rearwardly extending arms engageable by one of the eccentrics, a balance plate reciprocably mounted in superposed relation above the sickle plate behind the blades thereof and including rearwardly extending arms engageable by the opposite eccentric whereby the sickle plate and balance plate will move in opposed relation, and spring means arranged above the balance plate and acting thereupon for normally urging the balance plate into firm contact with the sickle plate and the sickle plate into firm contact with the base plate.

12. In a suction lawn mower, a mower unit

including a reciprocating sickle plate, a reciprocating balance plate for the sickle plate, and means for operating the sickle plate and balance plate in opposed relation to one another, said balance plate being of a weight to counterbalance the entire weight of the sickle plate.

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