

[54] **ROTARY MOWER WITH SELECTIVELY ACTUATABLE EDGER**

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[51] Int. Cl. **A01d 35/26**

[58] Field of Search **56/DIG. 1, 2, 11.6, 13.7, 56/16.9, 256**

[56] **References Cited**

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[57] **ABSTRACT**

A rotary mower of the type including a body deck beneath which a horizontal rotary blade is disposed and

having a vertical output shaft motor supported from and in elevated position relative to the deck with the depending output shaft of the motor projecting downwardly through a central opening in the deck and having the rotary blade mounted thereon. A mount is secured to one side of the deck and a slide is supported from the mount for vertical shifting relative thereto. A first horizontal transverse spindle is journaled from the slide and has a vertically disposed rotary edging blade mounted thereon. A pair of second horizontal front-to-rear extending spindles are journaled from the mount in general axial alignment at the same side of the deck and the second spindles are shiftable along their axes of rotation and carry pulley wheels on their remote ends, the first horizontal transverse spindle supported from the slide also including a pulley wheel and the portion of the output shaft extending between the underside of the motor and the upper side of the deck having a drive pulley mounted thereon. An endless flexible belt is trained about the drive pulley and the pulleys carried by the spindles and the spindles journaled from the mount and the slide include coaxing structure whereby the horizontal front-to-rear extending spindles are shifted apart as the slide is lowered to an intermediate position from its upper position to tension the drive belt and the front-to-rear extending spindles are allowed to shift back toward each other as the slide is lowered from its intermediate position to a lower position.

7 Claims, 8 Drawing Figures

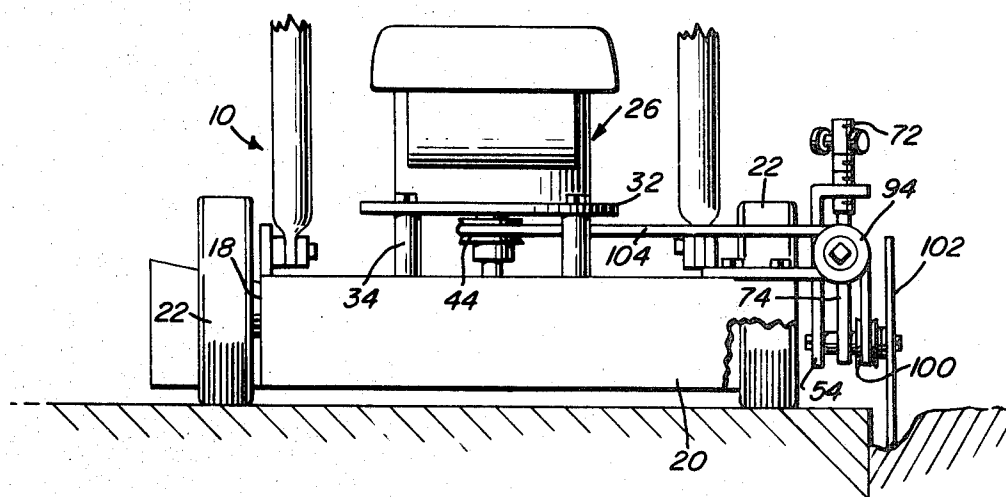


Fig. 1

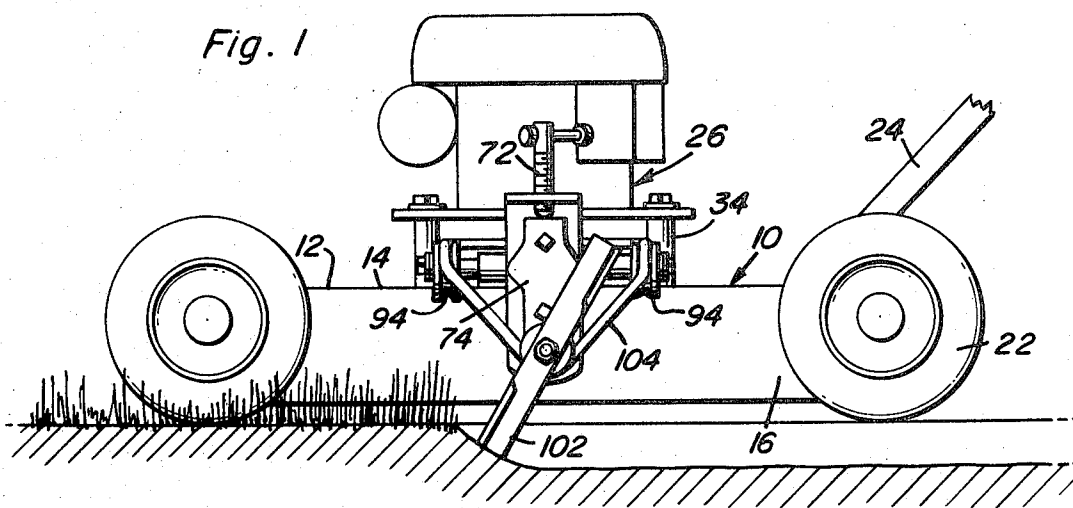


Fig. 2

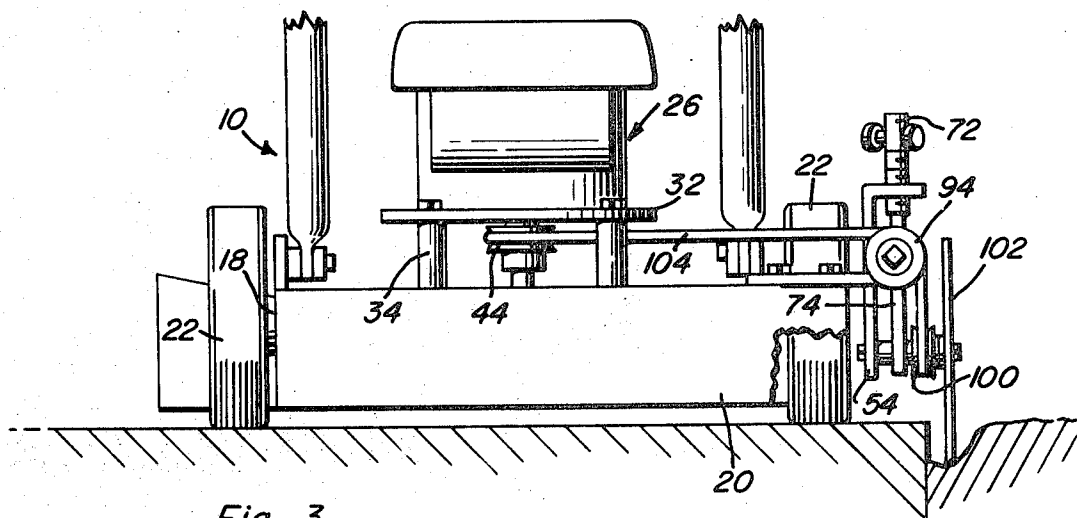


Fig. 3

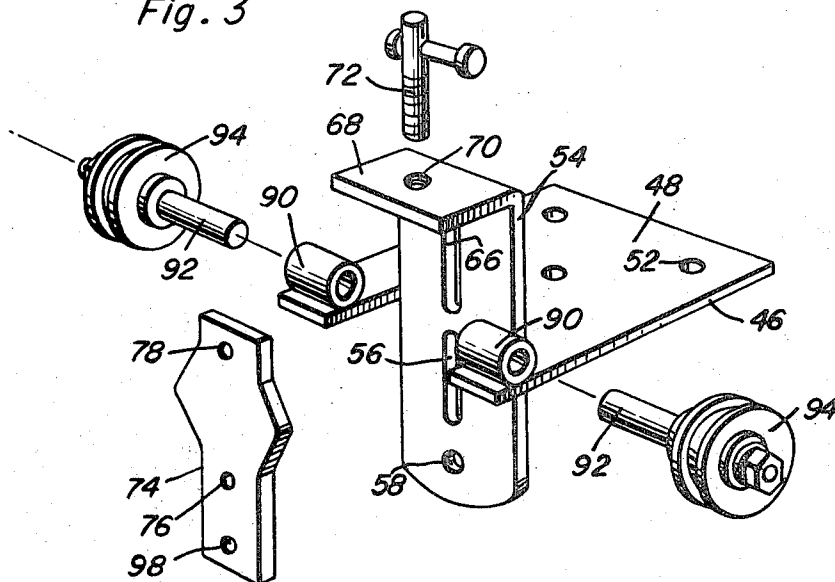


Fig. 4

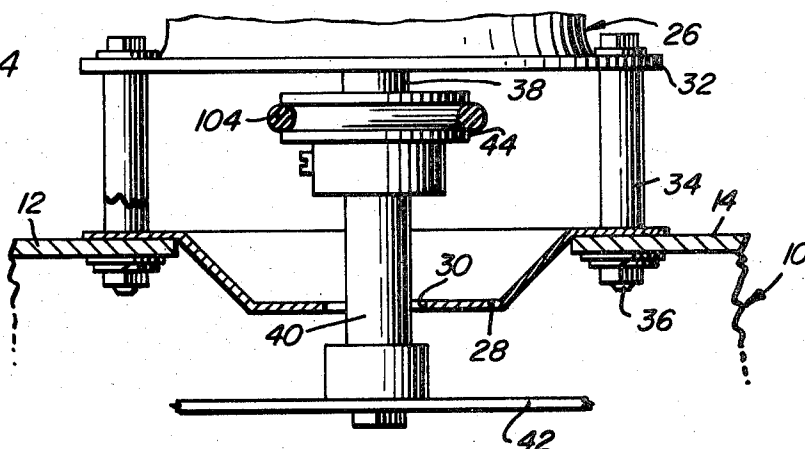


Fig. 5

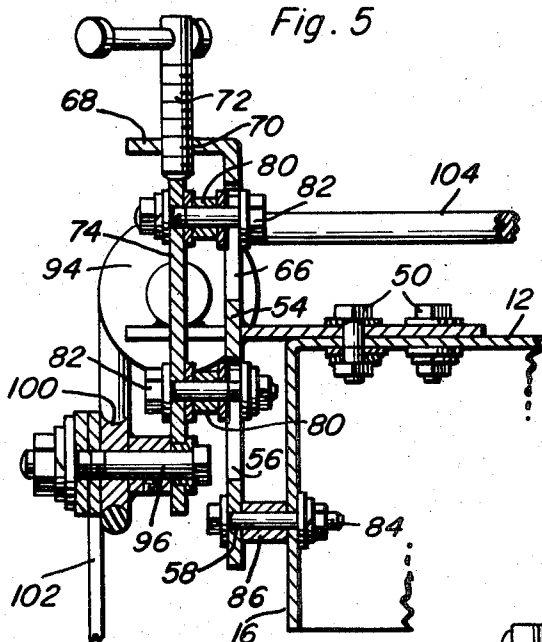


Fig. 7

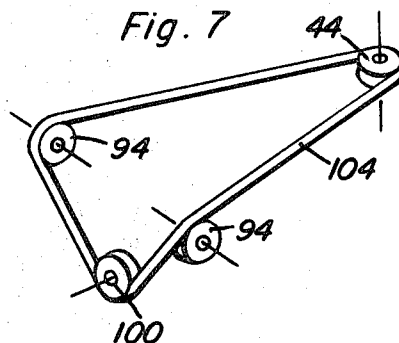


Fig. 8

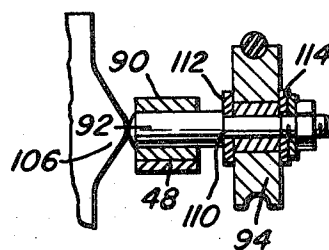
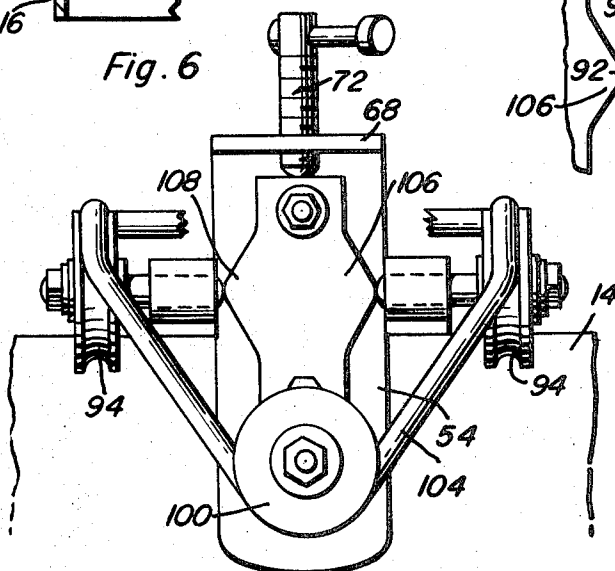


Fig. 6



ROTARY MOWER WITH SELECTIVELY ACTUATABLE EDGER

The selectively actuatable rotary edger attachment of the instant invention has been designed to provide a means whereby an effective edging attachment may be provided on a conventional rotary mower. The edger attachment may be selectively driven from the output shaft of the vertical shaft motor on the rotary mower and an endless flexible belt is utilized to drive the edging attachment from the vertical shaft of the mower motor. The edging attachment is mounted for vertical shifting on one side of the mower and structure is provided whereby the drive belt is slack when the edging attachment is raised to its uppermost position and the drive belt may be tensioned as the edging attachment is lowered to an intermediate position with the tension of the belt being maintained substantially constant thereafter as the edging attachment is further shifted downwardly from its intermediate position to a lower position. In this manner, the drive to the edging attachment may be disengaged when the edging attachment is raised to an inoperative position and the drive for the edging attachment may be actuated as the attachment is lowered to an initial operative position, the attachment thereafter being shiftable downwardly to further lowered positions to control the depth of the edging cut while the drive belt tension is maintained.

The main object of this invention is to provide a rotary mower with a novel selectively actuatable edger.

Another object of this invention is to provide a vertically adjustable edging attachment for a rotary mower which will be automatically disengaged from the vertical drive shaft of the rotary mower as the attachment is elevated to a raised inoperative position.

A still further object of this invention is to provide an edging attachment for a rotary mower which will enable substantially all edging operations to be carried out efficiently by a rotary mower modified in accordance with the present invention.

A final object of this invention is to provide a rotary mower edging attachment which will conform to conventional forms of manufacture, be of simple construction and easy to use so as to provide a device that will be economically feasible, long lasting and relatively trouble free in operation.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout.

FIG. 1 is a side elevational view of a conventional form of rotary mower modified in accordance with the present invention so as to be provided with an edging attachment and with the edging attachment illustrated in a lowered operative position;

FIG. 2 is a front elevational view of the assembly illustrated in FIG. 1 as seen from the left side of FIG. 1;

FIG. 3 is an exploded perspective view of the mounting structure for the edging attachment;

FIG. 4 is a fragmentary enlarged vertical sectional view taken substantially upon a plane passing through the center of the upstanding drive shaft of the rotary mower illustrating the manner in which the mower en-

gine is supported in elevated position above the deck of the mower and provided with a drive pulley;

FIG. 5 is an enlarged fragmentary vertical transverse sectional view taken substantially upon a plane passing through the center of the edging attachment;

FIG. 6 is an enlarged side elevational view of the edging attachment with the edger blade thereof removed;

FIG. 7 is a schematic view of the belt drive system of the edging attachment; and

FIG. 8 is an enlarged fragmentary vertical sectional view taken substantially upon a plane passing through one of the axially shiftable idler pulley spindles of the edging attachment.

Referring now more specifically to the drawings, the numeral 10 generally designates a conventional form of rotary mower including a sheet metal body 12 defining an upper deck 14 and depending opposite side flanges 16 and 18 as well as depending front and rear flanges 20. The body 12 is equipped with front and rear opposite side wheels 22 journaled from the side flanges 16 and 18, a rearwardly and upwardly extending handle 24 and an engine referred to in general by the reference numeral 26 supported from the deck 14.

The central area of the deck 14 is depressed as at 28 and has a central opening 30 formed therein. The lower mounting flange portion 32 of the engine or motor 26 is supported in elevated position above the deck 14 by means of tubular spacer members 34 through which fasteners 36 are secured. The motor 26 has a depending output shaft 38 including a lower end extension 40 which projects through the opening 30 and has a horizontal blade 42 mounted thereon. In addition, a drive pulley 44 is mounted on that portion of the shaft 38 which extends between the underside of the motor 26 and the deck 14.

The foregoing comprises a description of a conventional form of rotary mower, except for the motor 26 being elevated above the deck 14 by means of the spacer members 34 and the shaft 38 including an extension 40. Conventionally, the lower side of the motor 26 rests upon the deck 14 and the blade 42 is secured to the lower end of the shaft 38 and not the extension 40.

A mounting bracket 46 including a horizontal flange portion 48 is secured to the side marginal portion of the deck 14 adjacent the flange 16 by means of suitable fasteners 50 secured through apertures 52 provided therefor in the horizontal flange portion 48 and corresponding apertures (not shown) formed in the deck 14. The mounting bracket 46 includes an upstanding flange portion 54 at its outer side edge and the flange portion 54 extends both upwardly above and below the horizontal flange portion 48. The lower end of the upstanding flange portion 54 is provided with a vertical slot 56 and a lower end bore 58. In addition, the upper end portion of the vertical flange 54 is provided with a vertical slot 66 and an outwardly directed upper terminal end 68 defining a horizontal flange. The flange 68 is provided with a threaded bore 70 through which a thrust bolt 72 is threadably engaged and a slide plate 74 is supported from the flange 54 by means of threaded fasteners 82 secured through vertically spaced bores 76 and 78 formed in the slide plate 74 and the slots 56 and 66 formed in the flange 54 with a pair of tubular spacer members 80 through which the fasteners 82 extend being disposed between the slide plate 74 and the up-

standing flange 54. The lower end of the upstanding flange 54 is secured to the flange 16 in spaced relation relative thereto by means of a fastener 84 secured through bore 58 and a tubular spacer 86 disposed between the flange 16 and the lower end of the upstanding flange 54.

The mounting bracket 46 additionally includes a pair of journal sleeves 90 through which a pair of front-to-rear extending spindles 92 are slidably and rotatably received. The spindles 92 have idler pulleys 94 mounted on their remote ends and it may be seen from the drawings that the axes of rotation of the spindles 92 are spaced slightly above the deck 14. A fastener 96 is secured through a lower bore 98 formed in the slide plate 74 and the fastener 96 has a pulley 100 journaled thereon. In addition, a vertically disposed rotary edging blade 102 is mounted on the fastener 96 for rotation with the pulley wheel 100. An endless flexible belt 104 is trained about the pulley 44, the pulley wheels 94 and the pulley wheel 100. Accordingly, when the belt 104 is tensioned, the shaft 38 is drivingly coupled to the upstanding rotary edging blade 102.

The front and rear sides of the slide plate 74 include double ramp cam lobes 106 and 108 which are engageable with the adjacent rounded ends of the spindles 92 and it may of course be appreciated that the slide plate 74 may be shifted upwardly and downwardly along the vertical flange 54.

With the thrust screw 72 raised and the slide plate 74 raised with the cam lobes 106 above the adjacent ends of the spindles 92, the latter are free to shift toward each other to thereby untension the belt 104. However, as the slide plate 74 is lowered to the intermediate position thereof illustrated in FIG. 6 of the drawings, the cam lobes 106 force the adjacent ends of the spindles 92 apart so as to tension the belt 104. Thereafter, as the slide plate 74 is further lowered, although the lowering of the pulley wheel 100 would have a tendency to further tension the belt 104, the adjacent ends of the spindles 92 move upwardly along the upwardly convergent upper ramp surfaces of the cam lobes 106 so as to allow the spindles 92 to again shift toward each other and the shifting of the cam lobes 92 toward each other enables the tensioning of the belt 104 to be maintained substantially constant even though the pulley wheel 100 is being further lowered relative to the pulley wheels 94. In this manner, once the slide plate 74 has been lowered to the position thereof illustrated in FIG. 6 of the drawings so that the ends of the blade 102 initially contact the ground to be trimmed, the blade 102 may be further lowered to increase the depth of cut of the blade 102 without changing the tension of the drive belt 104. Of course, as the slide plate 74 is again elevated past the position thereof illustrated in FIG. 6 of the drawings, not only is the pulley 100 being elevated relative to the pulleys 94 but the spindles are allowed to shift back toward each other so as to untension the belt 104 and thus disconnect the drive from the shaft 38 to the pulley wheel 100.

Each of the spindles 92 is shouldered as at 110 and each pulley wheel 94 is disposed between the thrust washers 112 and 114. In addition, the pulley wheel 44 may be secured to the shaft 38 in any convenient manner and the extension 40 may be secured to the lower end of the shaft 38 by any suitable method so as to maintain the proper elevation of the blade 42 relative

to the ground when the motor 26 is elevated and secured in the position illustrated in FIGS. 1, 2 and 4.

In order to force the slide plate 74 downwardly, the thrust screw 72 is engaged with the upper end of the slide plate 74. Therefore, the thrust screw 72 may be turned so as to force the slide plate 74 downwardly.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention.

What is claimed as new is as follows:

1. In combination, a rotary mower including front and rear ends and opposite sides as well as a horizontal deck beneath which a rotary blade is disposed, an upstanding driven shaft portion spaced inwardly of one side of said deck, an edging attachment including a drive pulley mounted on said shaft portion for rotation therewith, a mount supported from said one side of said deck, a slide supported from said mount for vertical adjustment relative thereto, journal means supported from said slide and having a vertically disposed rotary edging blade journaled therefrom for rotation about a horizontal transverse axis, a torque input pulley supported for rotation with said blade, a pair of horizontal front-to-rear extending spindles journaled from said mount at said one side of said deck and in general axial alignment with each other and shiftable along the axes of rotation thereof, said spindles having idler pulleys mounted thereon disposed on opposite sides of an upstanding transverse plane containing said driven shaft portion and spaced in general horizontal alignment with said drive pulley above said torque input pulley, an endless flexible drive member trained about said drive pulley, said torque input pulley and said idler pulleys, and said slide and spindles including coacting means operative to shift said spindles away from each other in response to lowering of said slide relative to said mount from an upper position thereof.

2. The combination of claim 1 wherein said coacting means includes means operative to shift said spindles toward each other in response to said slide being lowered downward past a predetermined intermediate position toward a predetermined lower position.

3. In combination, a rotary mower including front and rear ends and opposite sides as well as a wheeled horizontal deck beneath which a horizontal rotary blade is disposed with a vertical output shaft motor supported from and in elevated position relative to the deck and including a depending output shaft projecting downwardly through a central opening in the deck and having the rotary blade mounted thereon, an edging attachment for said mower, said attachment including a drive pulley mounted on the portion of said shaft extending between the underside of said motor and said deck, a mount secured to one side of said deck, a slide supported from said mount for vertical adjustment relative thereto, journal means supported from said slide and having a vertically disposed rotary edging blade journaled therefrom for rotation about a horizontal transverse axis, a torque input pulley supported for rotation with said blade, a pair of horizontal front-to-rear extending spindles journaled from said mount at said one side of said deck and in general axial alignment

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with each other and shiftable along the axes of rotation thereof, said spindles having idler pulleys mounted thereon disposed on opposite sides of an upstanding transverse plane containing said output shaft and spaced in general horizontal alignment with said drive pulley above said torque input pulley, an endless flexible drive member trained about said drive, pulley, said torque input pulley and said idler pulleys, and said slide and spindles including coacting means operative to shift said spindles away from each other in response to lowering of said slide relative to said mount from an upper position thereof.

4. The combination of claim 3 wherein said coacting means includes means operative to shift said spindles toward each other in response to said slide being lowered downward past a predetermined intermediate position toward a predetermined lower position.

5. The combination of claim 4 wherein the last mentioned means includes means operative to maintain substantially the same tension on said drive member during downward movement of said slide from said intermediate position to said lower position.

6. In combination, a rotary mower including front and rear ends and opposite sides as well as a wheeled horizontal deck beneath which a horizontal rotary blade is disposed with a vertical output shaft motor supported from and in elevated position relative to the deck and including a depending output shaft projecting downwardly through a central opening in the deck and having the rotary blade mounted thereon, an edging attachment for said mower, said attachment including a drive pulley mounted on the portion of said shaft extending between the underside of said motor and said deck, a mount secured to one side of said deck, a slide supported from said mount for vertical adjustment relative thereto, journal means supported from said slide and having a vertically disposed rotary edging blade journaled therefrom for rotation about a horizontal transverse axis, a torque input pulley supported for ro-

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tation with said blade, drive means including an endless drive belt drivingly connecting said drive pulley to said torque input pulley, said drive means and said slide including coacting means operative to untension said belt in response to movement of said slide from a predetermined intermediate position toward an upper position disposed thereabove, said coacting means also being operative to tension said belt in response to downward shifting of said slide from said upper position toward said intermediate position and maintain generally constant tension of said belt in response to downward shifting of said slide from said intermediate position to a predetermined lower position.

7. In combination, a rotary mower including front and rear ends and opposite sides as well as a horizontal deck beneath which a rotary blade is disposed, an upstanding driven shaft portion spaced inwardly of one side of said deck, an edging attachment including a drive pulley mounted on said shaft portion for rotation therewith, a mount supported from one side of said deck, a slide supported from said mount for vertical adjustment relative thereto, journal means supported from said slide and having a vertically disposed rotary edging blade journaled thereon for rotation about a horizontal transverse axis, a torque input pulley supported for rotation with said blade, drive means including an endless drive belt drivingly connecting said drive pulley and said torque input pulley, said drive means and slide including coacting means operative to untension said belt in response to movement of said slide from a predetermined intermediate position toward an upper position disposed thereabove, said coacting means also being operative to tension said belt in response to downward shifting of said slide from said upper position toward said intermediate position, and maintain generally constant tension of said belt in response to downward shifting of said slide from said intermediate position to a predetermined lower position.

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