# United States Patent

**Danuser**

[15] **3,691,860**

[45] **Sept. 19, 1972**


[54] **SNOW BLOWER DRIVE**


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[73] Assignee: **Danuser Machine Works, Inc.**, Claremore, Okla.



[22] Filed: **May 21, 1971**

[21] Appl. No.: **145,687**

[52] **U.S. Cl.** .....**74/242.1 R**, 74/219, 74/242.15 R

[51] **Int. Cl.**.....**F16h 7/12**, F16h 7/10, F16h 7/00

[58] **Field of Search**.....74/242.1 R, 242.11 R, 242.15 R, 74/219



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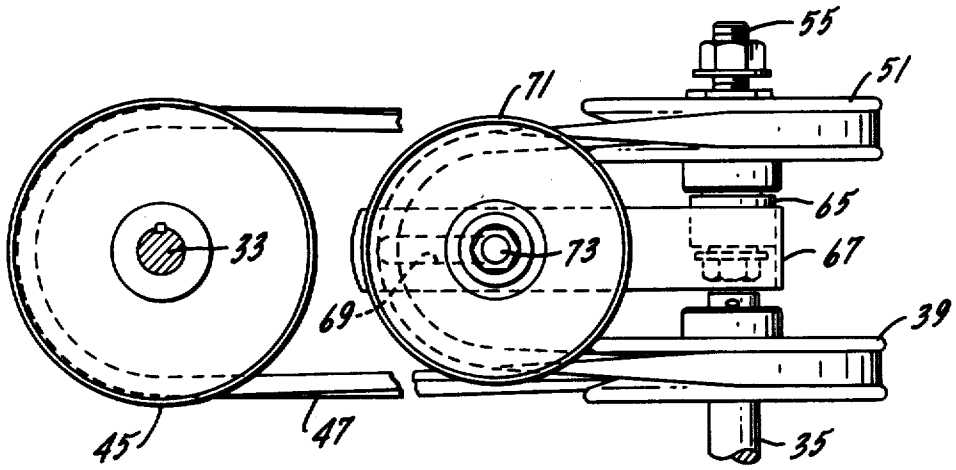
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[57] **ABSTRACT**

A drive for a snow blower of the type which is detachably mounted on a tractor. The drive includes an input drive sheave which connects to the tractor and an output drive sheave which drives the snow blower auger. The shafts on which these sheaves are mounted extend at 90° relative to each other. The sheaves are connected by a drive belt of the vee type. An idler sheave and a tension sheave also engage the drive belt and the arrangement of these sheaves provides the 90° drive without the use of gears. The tension sheave is attached to a pivotally mounted arm which permits the tension sheave to move in an arc in drive belt tensioning and non-tensioning directions. Spring means are provided to bias the tension sheave in a belt tensioning direction and means are provided to permit adjustment of the sheave on its mounting arm.


**5 Claims, 5 Drawing Figures**



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SHEET 1 OF 2

Fig. 1.

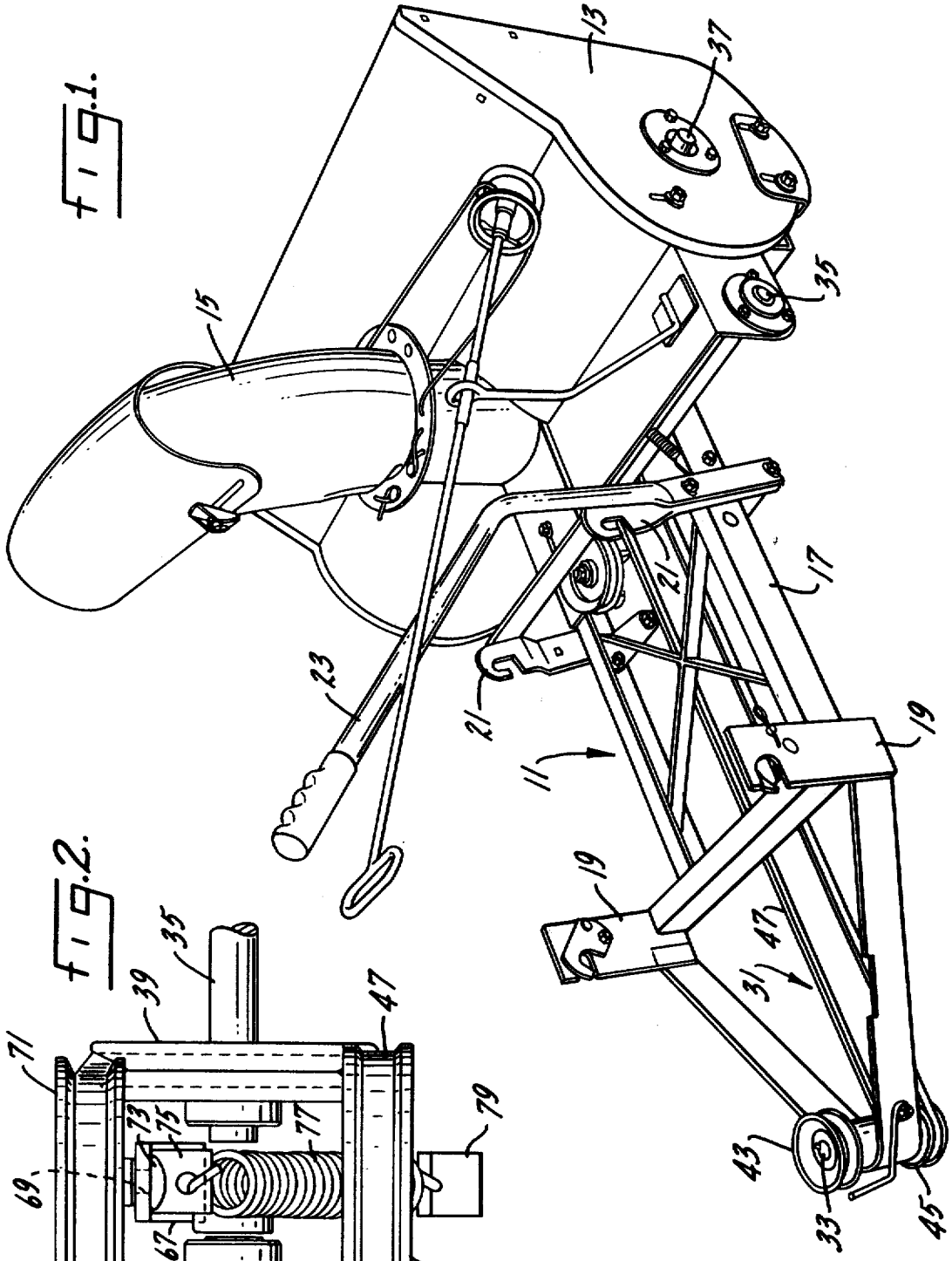



Fig. 2.




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fig. 3.

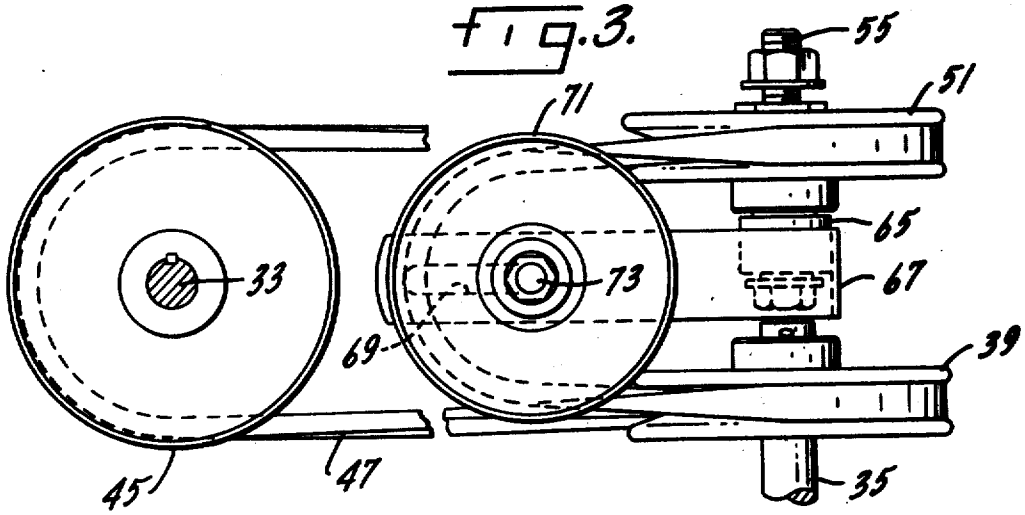
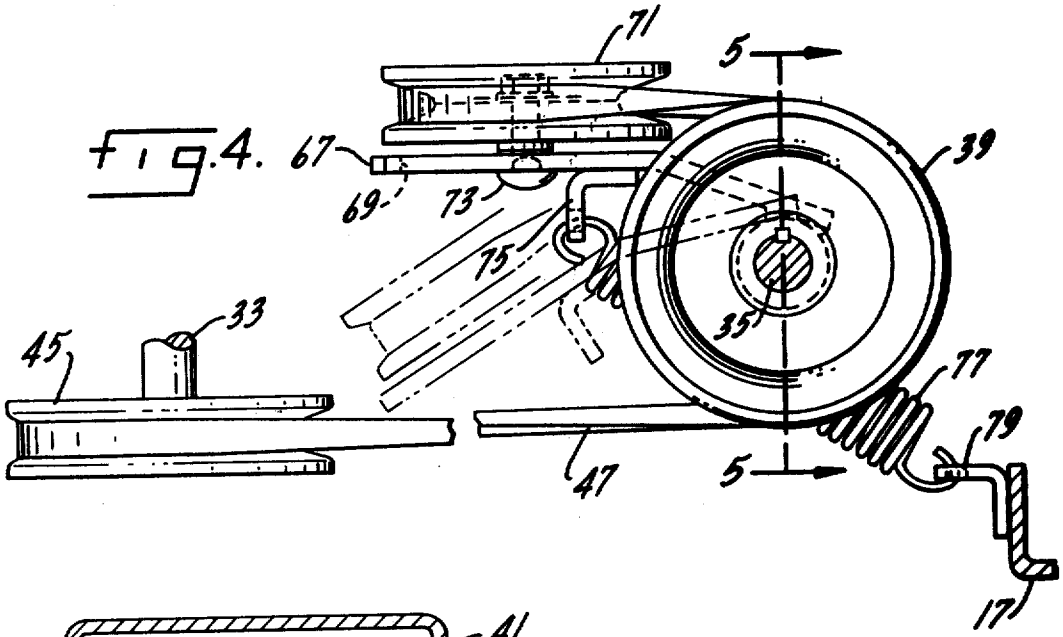



fig. 4.



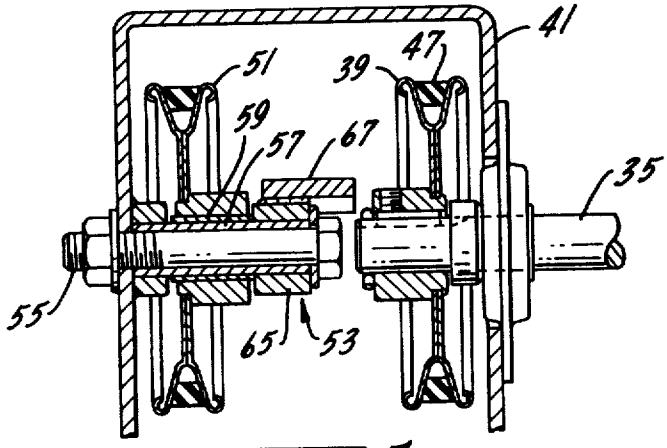




fig. 5.

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# SNOW BLOWER DRIVE

## SUMMARY OF THE INVENTION

This invention is concerned with a drive for a snow blower of the type which detachably mounts on a tractor and more particularly with a 90° drive utilizing only sheaves and a vee belt.

An object of this invention is a 90° drive which does not require gears.

Another object is to maintain tension on the drive belt of a snow blower while providing for a large range of take-up adjustments.

Another object is a tensioning mechanism for a drive belt in which the amount of tension applied may be varied over a wide range.

Other objects may be found in the following specification, claims and drawings.

## BRIEF DESCRIPTION OF THE DRAWINGS

The invention is illustrated more or less diagrammatically in the following drawings wherein;

FIG. 1 is a perspective view of a snow blower embodying the drive of this invention;

FIG. 2 is an enlarged, partial end elevational view of the drive belt direction changing and tensioning mechanism of this invention with parts omitted for clarity;

FIG. 3 is an enlarged partial top plan view of the drive belt direction changing and tensioning mechanism of this invention;

FIG. 4 is an enlarged, partial side elevational view of the mechanism of FIG. 3 showing the movable tension sheave in phantom in its position of maximum take-up; and

FIG. 5 is a cross-sectional view taken along line 5—5 of FIG. 4.

## DESCRIPTION OF THE PREFERRED EMBODIMENT

FIG. 1 of the drawings shows a snow blower 11 or snow thrower as it is sometimes called. This unit is intended to be detachably mounted on a tractor of the farm or garden type but which is not shown in these drawings. The snow blower includes a housing 13 which contains an auger (not shown) for engaging and propelling the snow through the discharge chute 15. The auger housing is mounted on a frame 17 which may be connected to a tractor by means of rear support hooks 19 and front support hooks 21. The front support hooks are pivotally connected to the frame and are moved by a control handle 23.

The snow blower drive 31 includes an input shaft 33 mounted at the tractor end of the frame 17 and an output shaft 35 located adjacent the auger housing. The output shaft extends at an angle of 90° relative to the input shaft. The output shaft connects by means of a chain drive (not shown) to a sprocket gear (not shown) mounted on the auger shaft 37. An output sheave 39 is affixed to one end of the output shaft 35 and is located in a guard or housing 41. Upper and lower sheaves 43 and 45 are affixed to the input shaft 33 and a drive belt 47 connects the lower input sheave with the output sheave 39.

The drive belt 47 also passes around an idler sheave 51 which is rotatably mounted on a stub 53. The stub, FIG. 5, includes a bolt 55 fastened to the housing 41 to position the stub generally in axial alignment with the output shaft 35. A sleeve 57 is installed over the bolt 55. The sheave 51 fits over a bearing 59 mounted on the sleeves 57.

A second sleeve 65 is journaled on the sleeve 57 of the stub 53. Welded to this second sleeve is a bent arm 67. An elongated slot 69 is formed in the arm near the free end thereof and an idler sheave 71 is pivotally mounted on the arm by means of a threaded fastener 73 passing through the slot 69. A bracket 75 is attached to the underside of the arm 67 and a tension spring 77 connects to this bracket and to a bracket 79 attached to the frame 17 of the snow blower.

The use, operation and function of this invention are as follows:

The tractor drive is connected to the upper drive sheave 43 by means of a belt (not shown). Rotation of the sheave 43 will rotate the input shaft 33 and input sheave 45 bringing about movement of the belt 47. Movement of the belt will cause rotation of the output sheave 39 which will drive the output shaft 35. Rotation of the output shaft will bring about rotation of the auger shaft 37.

In order to provide a 90° drive, or stated another way, an output shaft which extends at right angles to the input shaft, without using gears, the drive belt 47 is looped around the fixed idler sheave 51 and the tension idler sheave 71. The tension idler sheave is positioned between the output sheave 39 and the fixed idler sheave 51 which have a common axis of rotation. This axis extends 90° relative to the axis of rotation of the input sheave 45. The tension idler sheave axis of rotation is generally parallel to the shaft of the input sheave and extends at right angles to the output shaft 35.

When the belt is under its normal drive tension, the tension pulley 71 will be in the position shown in solid lines in FIG. 4. When the tension on the belt 47 is reduced due, for example, to stretching of the belt, the tension spring 77 will move the tension sheave 71 to the position shown in phantom in FIG. 4 thereby maintaining proper tension on the belt 47. It the movement of the tension sheave between the extreme positions shown in FIG. 4 is not sufficient to maintain proper tension on the belt, the sheave 41 may be moved longitudinally along its support arm 67 through means of the fastener 73 and slot 69 to increase tension on the belt 47. Conversely, the provision of the fastener 73 and slot 69 permit loosening of the tension on the belt 47 under appropriate circumstances.

Whereas, the preferred form of the invention has been described and shown, it should be understood that there are modifications, alterations and changes which may be made without departing from the teachings of the invention. Therefore, the scope of the invention should be only limited by the claims attached hereto.

I claim:

1. A drive for a snow blower of the type which detachably mounts on a tractor, said drive including:

an output drive shaft mounted near the snow blower housing,

a drive sheave mounted on said output drive shaft,

an idler sheave rotatably mounted on a stub with said stub spaced from and axially aligned with said output drive shaft,

an input drive sheave located away from said snow blower housing,

said input drive sheave mounted on an input shaft extending at right angles to said output drive shaft,

a drive belt engaging said drive and idler sheaves, and

a tension sheave engaging said drive belt,

said tension sheave positioned between said idler sheave and said output drive sheave with the rotational axis of said tension sheave extending at right angles to said output drive shaft.

2. The drive of claim 1 further characterized in that means are provided for adjustably attaching said tension sheave to an arm which is pivotally mounted for arcuate movement to tighten and loosen said drive belt,



and

means are provided for biasing said tension sheave on a drive belt tightening direction.

3. The drive of claim 2 further characterized in that said means adjustably attaching said tension sheave to an arm includes an elongated slot in said arm and a fastener extending through said sheave and said slot.

4. The drive of claim 2 further characterized in that said means biasing said tension sheave in a belt tightening direction includes a tension spring attached to said tension sheave arm.

5. The drive of claim 2 further characterized in that said tension sheave arm is pivotally attached to said idler stub.

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