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SNOW BLOWER

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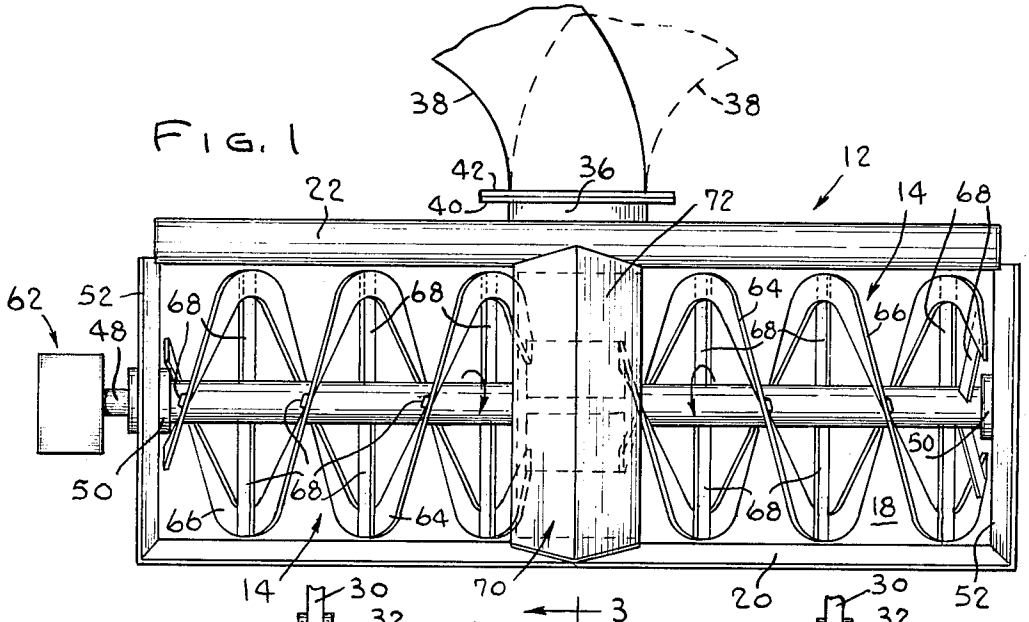

FIG. 1

FIG. 2

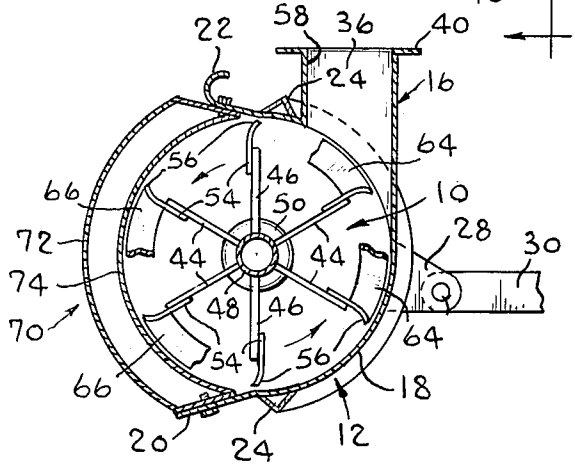

FIG. 3

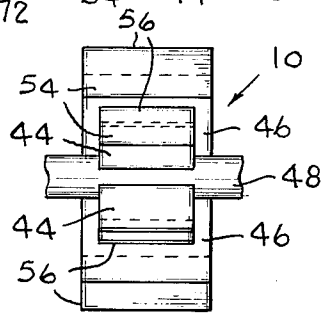

FIG. 4

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SNOW BLOWER

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This invention pertains to improvements in snow blowers of the type adapted to be mounted on the front end of a vehicle and employing conveyor flights to chew into the snow and feed the snow to a centrifugal blower which propels the snow through a discharge chute.

The principal object of this invention is to improve the efficiency of the blower.

This object is attained by two features. The first feature comprises a blower having a first set of blower blades each of which are fed by a different conveyor flight and a second set of blower blades of somewhat greater width than those of the first set and which are used for the purpose of picking up the snow passed by the narrower blades and also for the purpose of increasing the air velocity through the discharge chute. The second feature comprises the provision of rearwardly curved blower tips when viewed in relation to the direction of rotation of the blower. The importance of this feature is in particular appreciated when the blower is used to remove or clear relatively wet snow. Most snow blowers known heretofore employ straight blower blades and thereby tend to throw the snow upwardly and forwardly in the discharge chute. If dry snow is being removed, the straight blades create no problem other than the expected small loss of effective velocity, but when handling wet snow, the straight blades cause the snow to be thrown against and to pack on the front wall of the discharge chute and thereby seriously impair or even stop the operation of the blower. The rearward curve of the blades, as contemplated in this invention, overcomes this problem. Further, the general tendency for wet snow to pack in other parts of the discharge chute is materially reduced by the increased air velocity produced by the aforementioned second set of blower blades.

Therefore, a further object of this invention is to provide a snow blower of a design that will materially reduce or completely eliminate the snow build up or packing problems encountered heretofore when removing relatively wet snow.

Other objects and advantages will be pointed out in or be apparent from the specification and claims, as will obvious modifications of the single embodiment shown in the drawings, in which:

FIG. 1 is a front plan view of the snow blower embodying the present invention;

FIG. 2 is a top view thereof with the curved chute portion being removed;

FIG. 3 is a view taken on line 3—3 of FIG. 2; and

FIG. 4 is a top view of the blower blades and a fractional view of the shaft to which they are secured.

Referring to the drawings, the snow blower embodying the present invention is comprised of a centrifugal blower **10** which is mounted in a housing **12** and to which snow is fed by conveyors **14** for discharge through discharge chute **16**.

The housing **12** is of an open half-cylinder design having a curved shell **18** with its lower edge angled downwardly to form a straight scraping lip **20** and with its upper edge **22** curved backwardly to thereby aid in directing the snow to be removed into the shell. The shell is reinforced by longitudinally extending angle irons **24** and curved ribs **26**. The shell is provided with two pairs of ears **28** which receive hitch members **30** and pins **32** to thereby permit pivotal mounting of the snow blower to the front end of a vehicle.

The discharge chute **16** is provided in the center of the shell **18** and is comprised of a vertically extending lower chute portion **36** and a curved chute portion **38** pivotally mounted thereon and adapted to be locked into two or more angular positions to thereby permit the discharge of snow to any particular location. Flanges **40** and **42** and means for locking them (not shown) are provided for this purpose.

The centrifugal blower **10** is positioned below the discharge chute **16** and has snow receiving blades **44** and somewhat wider auxiliary blades **46**, all of which are secured to the shaft **48** which is rotatably mounted by bearings **50** in the end plates **52** of housing **12**. Blades **44** and **46** are provided with tips **54** having rearwardly curved end portions **56**, the direction of curvature being made in relation to the direction of rotation of the shaft **48**. This rearward curve eliminates the packing of snow on the front wall **58** of the discharge chute when the snow blower is used on relatively wet snow. The tips may be made integral with the blades or may be separate and attached thereto by welding or other means. The shaft is adapted to be rotated with the power of the vehicle on which the snow blower is mounted and thus is provided with suitable connecting means **62**. The latter is shown schematically since several means for accomplishing this purpose are well known in the art. In the alternative the snow blower could be equipped with a separate motor for driving shaft **48**.

Right-hand and left-hand helically formed conveyor flights **64** and **66** respectively are provided on each side of the centrifugal blower **10** and are secured to the shaft **48** by ribs **68**. This construction provides "hollow" flights for the conveyors **14** and in particular permits a relatively easy and inexpensive manufacture of the conveyors. As best seen from FIG. 3, each of the four conveyor flights is connected to a different snow receiving blade **44**.

A splitter **70** having a V-shaped front wall **72** and an arcuate inside wall **74** is mounted on the shell **18** and in combination therewith provides a blower housing for the centrifugal blower **10**. Further, the splitter serves to divide the snow in front of the blower and to cause it to move into the conveyors **14** as the snow blower is advanced.

In operation, the snow blower is advanced over a snow covered surface and the shaft **48** is rotated in a counterclockwise direction (when viewed in FIG. 3). The scraping lip **20** and splitter **70** guide the snow into the conveyors **14** which in turn move the snow towards the centrally located centrifugal blower **10**. By virtue of the connection between the snow receiving blades **44** and the conveyor flights, each of the flights feeds a different blade **44** of the centrifugal blower. The snow is then propelled upwardly by blades **44** and auxiliary blades **46**, whereby the latter pick up any snow which is passed up or which falls off the narrower snow receiving blades **44** and also increase the air and snow velocity through the discharge chute **36**. The direction of the snow passing through chute portion **36** is substantially vertical because of the curvature of the tip ends **56**, and thus, the snow is not thrown against the front wall **58** but is permitted to gradually change its direction in the curved chute portion **38**. Further, the increase in velocity obtained by the auxiliary blades **46** is instrumental in preventing packing of wet snow in the curved chute portion **38**.

Although but one embodiment of the present invention has been illustrated and described, it will be apparent to those skilled in the art that various changes and mod-

ifications may be made therein without departing from the spirit of the invention or from the scope of the appended claims.

I claim:

1. A snow blower of the type adapted to be mounted on a vehicle and powered by a motor, comprising in combination:

a housing having an open front;

a discharge chute located generally equidistantly between the ends of said housing and having a generally vertically extending portion in direct communication with the inside of said housing and a curved portion mounted on said vertically extending portion;

a shaft rotatably carried by said housing and adapted to be rotated by the motor, said shaft carrying a first and second set of blower blades directly below said chute;

a splitter mounted on said housing and closing a portion of said open front to define with said housing a blower housing for said two sets of blades;

strip like right-hand and left-hand helical conveyor flights mounted on said shaft and on each side of said sets of blower blades, said flights being in spaced relationship in respect to said shaft, each of said flights being connected to a different one of the blades of said first set, the blades of both of said sets having tip portions curved backwardly in respect to the operable direction of said shaft to thereby provide a substantially vertical trajectory of travel of the snow propelled through said discharge chute; and the blades of said second set being of greater width than the blades of said first set.

2. A motor driven snow blower comprising;

a housing having an open front section and a discharge chute;

a shaft rotatably carried within said housing and adapted to be rotated by the motor of the snow blower;

a centrifugal blower contained in said housing and having a first set of blower blades and a second set of blower blades, both sets being secured to said shaft and each blade of said second set being positioned between two blades of said first set;

wall means mounted on said housing and closing a portion of said open front section to define with said housing a blower housing for said two sets of blades;

a plurality of strip like helically shaped conveyor flights secured to said shaft and in spaced relationship in respect to said shaft, to provide a central space between said flights and said shaft which space is in communication with said blower housing and permits movement of snow therethrough to blower housing, each of said flights terminating at a different one of the blades of said first set to thereby render each of said flights operable to feed a different one of the blades of said first set upon rotation of said shaft, the blower blades of both of said sets having faces which extend generally radially outwardly from said shaft and which have a portion projecting further towards said shaft than said strip-like conveyor flights, said two sets of blades cooperating with said conveyor flights to increase the air and snow discharge velocity.

3. A motor driven snow blower according to claim 2 wherein the blades of said second set are wider than the blades of said first set.

4. A motor driven snow blower according to claim 2 wherein said centrifugal blower is located generally equal distantly between the ends of said shaft, and wherein said first set of blower blades and said plurality of strip-like conveyor flights are comprised of four blades and four flights respectively with two flights being secured to said shaft on one side of said blower and the two other flights bein secured to said shaft on the other side of said blower.

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