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SCREW CONVEYOR FOR SNOW BLOWERS

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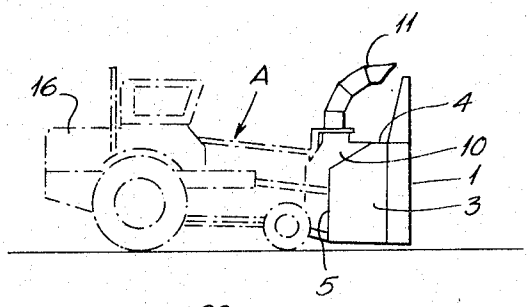


Fig. 1

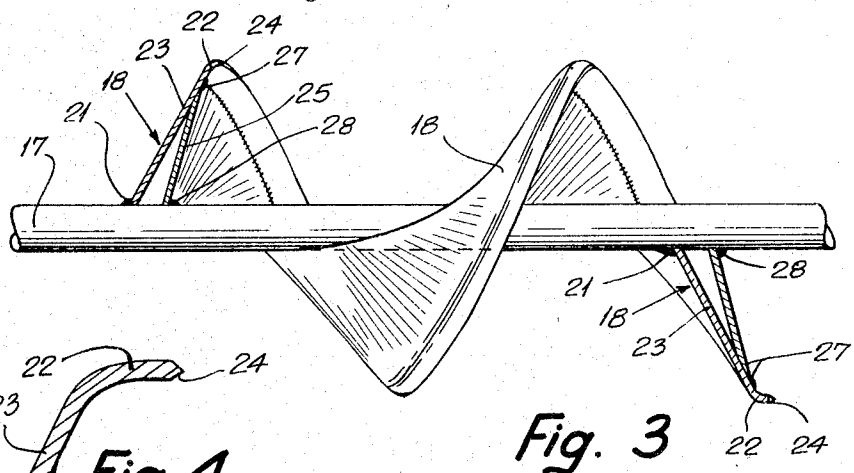


Fig. 3

Fig. 4

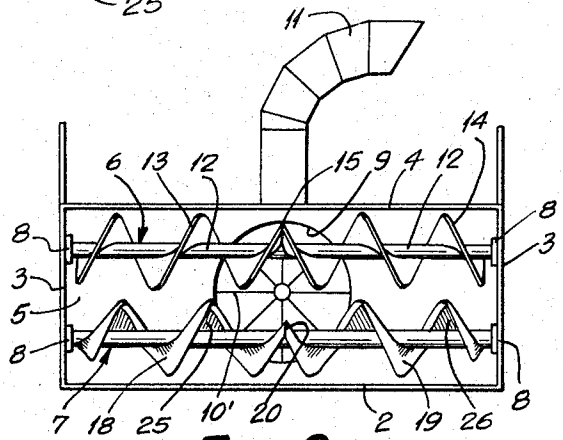


Fig. 2

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SCREW CONVEYOR FOR SNOW BLOWERS

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1 Claim. (Cl. 198—217)

The present invention relates to snow blowers and, more particularly, to a screw conveyor for use in snow blowers.

A well-known type of snow blower consists of a scoop mounted forwardly of a motor vehicle and provided with one or more superposed, transversely arranged, screw conveyors mounted for continuous rotation within the scoop, in order to engage the snow and direct the same laterally towards the center of the scoop, or towards one or the other of its ends, in order to feed the snow to a blower which, under centrifugal force, ejects the snow at high speed through a chute.

The conventional screw conveyor is efficient in powdered snow, but cannot disintegrate, in an efficient manner, blocks of ice or of hardened snow, and these blocks often cause breakage of the blower fan or wedge the same against rotation.

Several attempts have been made in order to disintegrate blocks of ice, or of hardened snow, before they reach the blower of the machine; for instance, hammer-like masses have been secured to the spiral of the conveyor screw or snow-slicing blades have been positioned at least in front of the blower opening, but all these means considerably increase the cost of manufacture of the snow blower and often decrease the efficiency of the snow blower in dry and powdered snow, because these hammers or slicing blades rotate in paths which are perpendicular to the axis of rotation of the conveyor screw and, therefore, do not serve by themselves to convey the snow laterally in the direction of the blower, but form an obstruction to the lateral movement of the snow.

Therefore, the general object of the present invention resides in the provision of a conveyor screw for snow removers or blowers, which is provided with means for slicing and disintegrating hardened snow and ice before the latter is fed to the blower, in order to prevent stoppage or breakage of the blower fan, and in which the conveyor screw remains efficient in all conditions of snow, the means for slicing and disintegrating the blocks of ice or hardened snow forming no obstruction whatever to the lateral movement of the snow towards the blower opening.

Another object of the present invention resides in the provision of a conveyor screw of the character described, which is of very simple and relatively inexpensive construction.

Yet another object of the present invention resides in the provision of a conveyor screw of the character described, which is preferably reinforced to prevent bending of the spiral of the screw under the forces imparted thereto during slicing and disintegrating of ice or hardened snow.

The foregoing and other objects of the present invention will become more apparent during the following disclosure and by referring to the drawings, in which:

FIGURE 1 is a schematic side elevation of a snow blower mounted in front of a motor vehicle, the latter being shown in dot-and-dash lines;

FIGURE 2 is a front elevation of the snow blower;

FIGURE 3 is an elevation, partially in cross section and on an enlarged scale, of a portion of the endless screw conveyor in accordance with the invention; and

FIGURE 4 is a partial cross-section, on an enlarged scale, of the spiral of the endless screw.

Referring more particularly to the drawings in which like reference characters indicate like elements throughout, reference letter A indicates a motor vehicle, such as a truck, farm tractor, or the like vehicle, in front of which is mounted a vertically adjustable scoop **1**, of conventional construction, and constituted by a bottom wall **2**, vertical lateral walls **3**, a top wall **4**, and a back wall **5**. The scoop is completely open at the front thereof to receive snow which enters the scoop under the action of the forward movement of the vehicle A.

Two superposed conveyor screws **6** and **7** respectively are mounted within the scoop **1** transversely of the latter, the conveyor screws being horizontally disposed. The ends of the shafts of the screws are mounted in journal boxes **8** secured to the lateral walls **3**.

The back wall **5** of scoop **1** is provided with an opening **9**, preferably at the center of the scoop, and the conveyor screws **6** and **7** serve to feed the snow laterally towards the opening **9**. The snow enters opening **9** of a casing **10** of a blower and is ejected by the blower fan **10'**, through a discharge chute **11** which is preferably arranged so as to be turned horizontally and vertically to adjust the direction of snow ejection.

The upper conveyor screw **6** is of conventional construction, comprising a shaft **12** mounted within journal boxes **8** and two spirals **13** and **14** surrounding and secured to the shaft **12**, the spirals having opposed pitch and joining at the center of the shaft, as shown at **15**. Shaft **12** is driven by a suitable transmission mechanism and engine **16**, which is preferably mounted at the back of vehicle A.

Snow which enters scoop **1** is moved laterally of the scoop by endless screw **6** towards the center of the scoop where it is fed to the blower fan **10'**.

Because screw **6** is disposed well above ground, it does not generally engage blocks of ice or hardened snow, but only engages powdered snow or wet snow. However, the lower conveyor screw **7**, which is just above ground, is liable to engage blocks of ice or hardened snow.

This conveyor screw **7** is modified in accordance with the principle of the present invention. Conveyor screw **7** comprises a shaft **17**, journalled in boxes **8** at its ends, in conventional manner, and driven by a conventional transmission mechanism, itself driven by engine **16**.

Shaft **17** is surrounded by two spirally wound metal strips **18** and **19**, of opposite inclination or pitch and joined at the center of the shaft at **20** opposite opening **9** of blower **10**. The radially inner edge **21** of strips **18** and **19** is directly welded at **21** to shaft **17**.

The major part **23** of the spiral **18** or **19** is straight when seen in cross-section and makes an angle with respect to shaft **17**. In accordance with the invention, the radially outer marginal portion of each spiral sheet **18** and **19** is bent to form an external marginal part **22**, which is at an angle with respect to main portion **23** of strips **18** and **19**.

The angle between parts **22** and **23** is selected such that part **22** generates a cylindrical surface co-axial with shaft **17**. The free edge of part **22** is preferably bevelled, as shown at **24**, but can be a straight edge.

As a non-limitative example, spiral strips **18** and **19** may have an external diameter of 26", marginal portion **22** a width of 1" and bent to form an angle of 60° with main portion **23**, the latter making in turn an angle of 30° with the axis of shaft **17**.

Marginal portion **22** is obtained by subjecting sheets **18** and **19** to a rolling operation after said sheets have

been formed into a spiral. Marginal portion **22** forms in all cases an angle of less than 180° with main portion **23** at the face of the latter which is opposite shaft **17**, or which makes an acute angle with the latter and, more generally, which is directed towards opening **9**.

It is preferable, although not essential, to reinforce strips **18** and **19** by means of additional spirally wound sheets **25** and **26**, respectively, the spiral of which having an external diameter less than main strips **18** and **19**.

The radially outer edges **27** of strips **25** and **26** are welded to strips **18** and **19**, respectively, in a zone just short of marginal portion **22** and at the face of strips **18** and **19**, making an acute angle with shaft **17**, that is to the internal faces of sheets **18** and **19**.

The radially inner edge **28** of strips **25** and **26** is directly welded to shaft **17** in a zone longitudinally spaced from weld **21**, whereby reinforcing strips **25** and **26** form an angle with shaft **17**, which is less acute than the similar angles formed by sheets **18** and **19**. Therefore, strips **25** and **26** form a V with main portions **23** of strips **18** and **19**, as shown in FIGURE 3.

It should be noted that marginal portions **22** of strips **18** and **19** are directed towards opening **9** of blower **10** during rotation of the conveyor screw **7**. Marginal portions **22** engage blocks of ice, or hardened snow, from the side and move the same directly towards opening **9**, while slicing said blocks of ice, or hardened snow.

The slicing action is efficient and the portions **22** do not form any obstruction against the movement of the snow laterally towards opening **9**. Therefore, the efficiency of the snow blower is not decreased when the snow is completely dry and in powder form, or when the snow is wet.

Reinforcing strips **25** and **26** positively prevent bending of strips **18** and **19** under the forces exerted during slicing and disintegrating action. If desired, upper conveyor screw **6** can be replaced by a conveyor screw similar to screw **7**, but, in practice, this has not been found necessary in normal snow conditions.

Bending of marginal **22** is effected by a rolling operation, as previously noted; this operation is very simple

and, therefore, the endless screw **7** in accordance with the present invention is only slightly more expensive to make than conventional endless screws such as screw **6**.

While a preferred embodiment in accordance with the present invention has been illustrated and described, it is understood that various modifications may be resorted to without departing from the scope of the appended claims.

What I claim is:

A conveyor screw for snow blowers comprising a shaft, a first strip spirally wound around said shaft having its radially inner edge secured to said shaft, the main portion of said first strip being substantially straight in cross-section, the radially outer marginal portion of said first strip making an angle of less than 180° with the face of said main portion, which is upstream with respect to the direction of rotation of said conveyor screw, said main portion being inclined at an acute angle with respect to said shaft and further including an additional reinforcing strip spirally wound around said shaft and having an external diameter less than the external diameter of said first strip, said additional strip secured to said first strip at its outer edge in a zone short of the outer marginal portion of said first strip and secured to said shaft at its internal edge in a zone longitudinally spaced from the zone of fixation of the internal edge of said first strip to said shaft.

References Cited by the Examiner

UNITED STATES PATENTS

2,320,723	6/1943	Gaylord	37—43
2,381,017	8/1945	Wandscheer.	

FOREIGN PATENTS

192,948	11/1957	Austria.
1,133,415	7/1962	Germany.

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