

[54] COMPRESSING FEED SCREW

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[58] Field of Search 214/83.32, 507; 198/213, 198/214, 64; 100/145; 259/9, 10, 97, 178; 241/246, 247, 260, 3

[56] References Cited

UNITED STATES PATENTS

643,891	2/1900	Bussells.....	198/213 X
647,354	4/1900	Anderson.....	198/213 X
1,557,773	10/1925	Pilcher et al.....	198/213 X

1,780,481	11/1930	Hale.....	198/213 X
1,863,964	6/1932	Brenner.....	214/83.32 X
2,059,435	11/1936	Brownlee.....	241/3 X
2,307,692	1/1943	Linde.....	214/83.32
2,991,947	7/1961	Schuyler.....	241/247 X
3,023,455	3/1962	Geier et al.....	259/9 X
3,570,654	3/1971	Hill.....	198/213

FOREIGN PATENTS OR APPLICATIONS

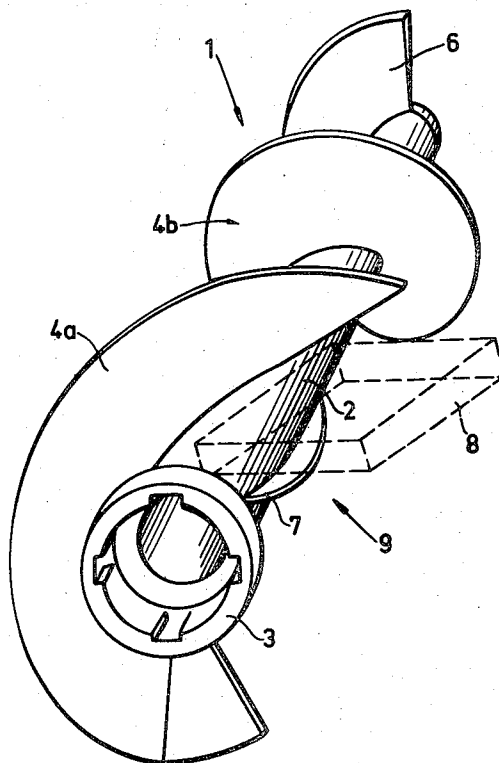
869,739	11/1941	France.....	198/214
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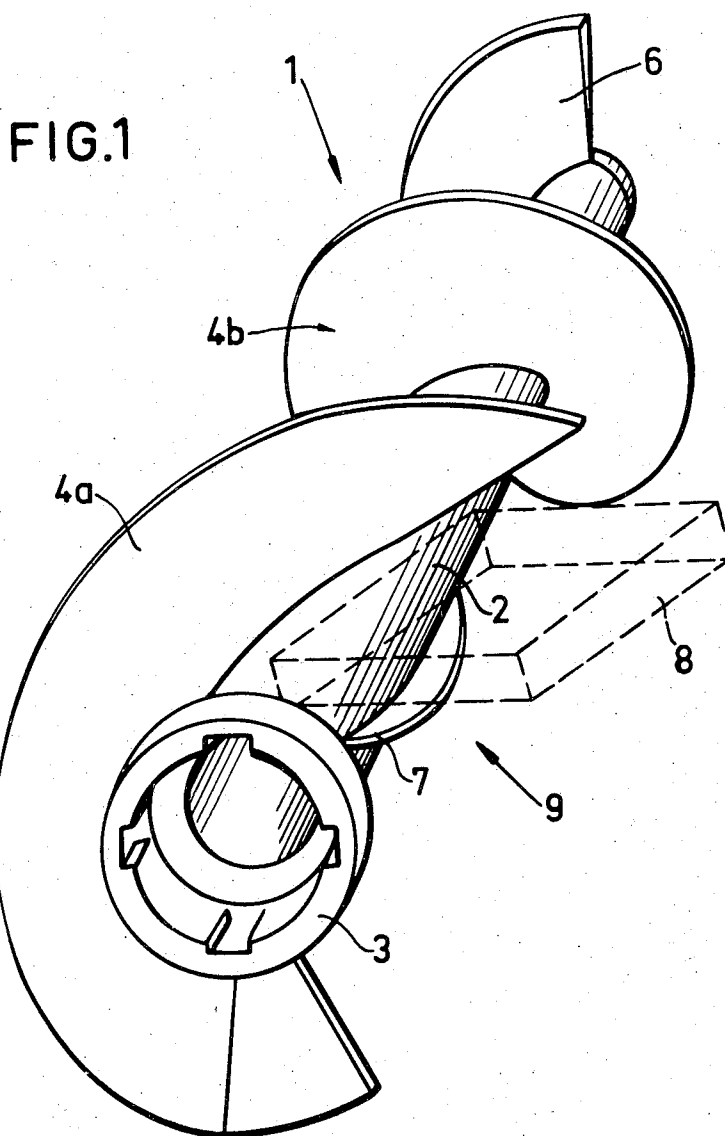
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[57] ABSTRACT

A compressing feed screw, which is particularly intended for feeding in and compressing refuse in a refuse container comprises a tubular shaft and a helical screw blade secured thereto. The screw blade comprises at least two portions which are separated from each other by a gap or an interval.

3 Claims, 5 Drawing Figures





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FIG.2

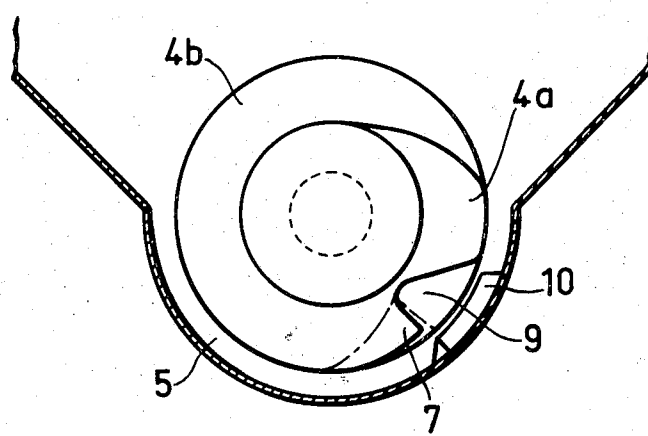
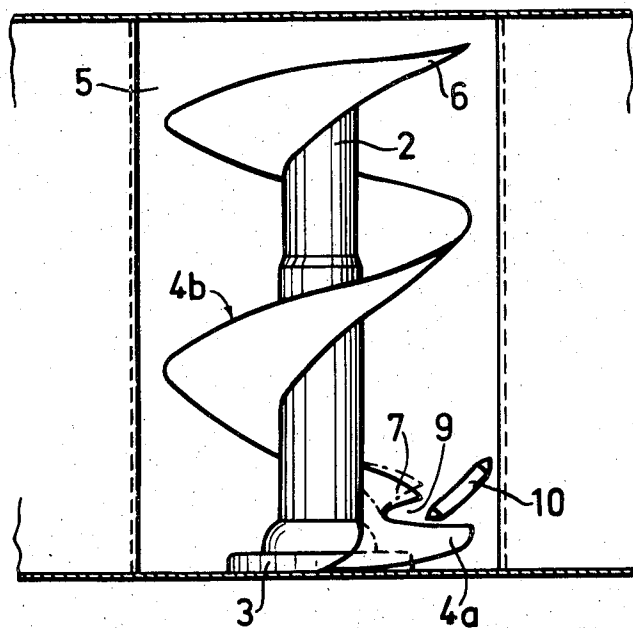
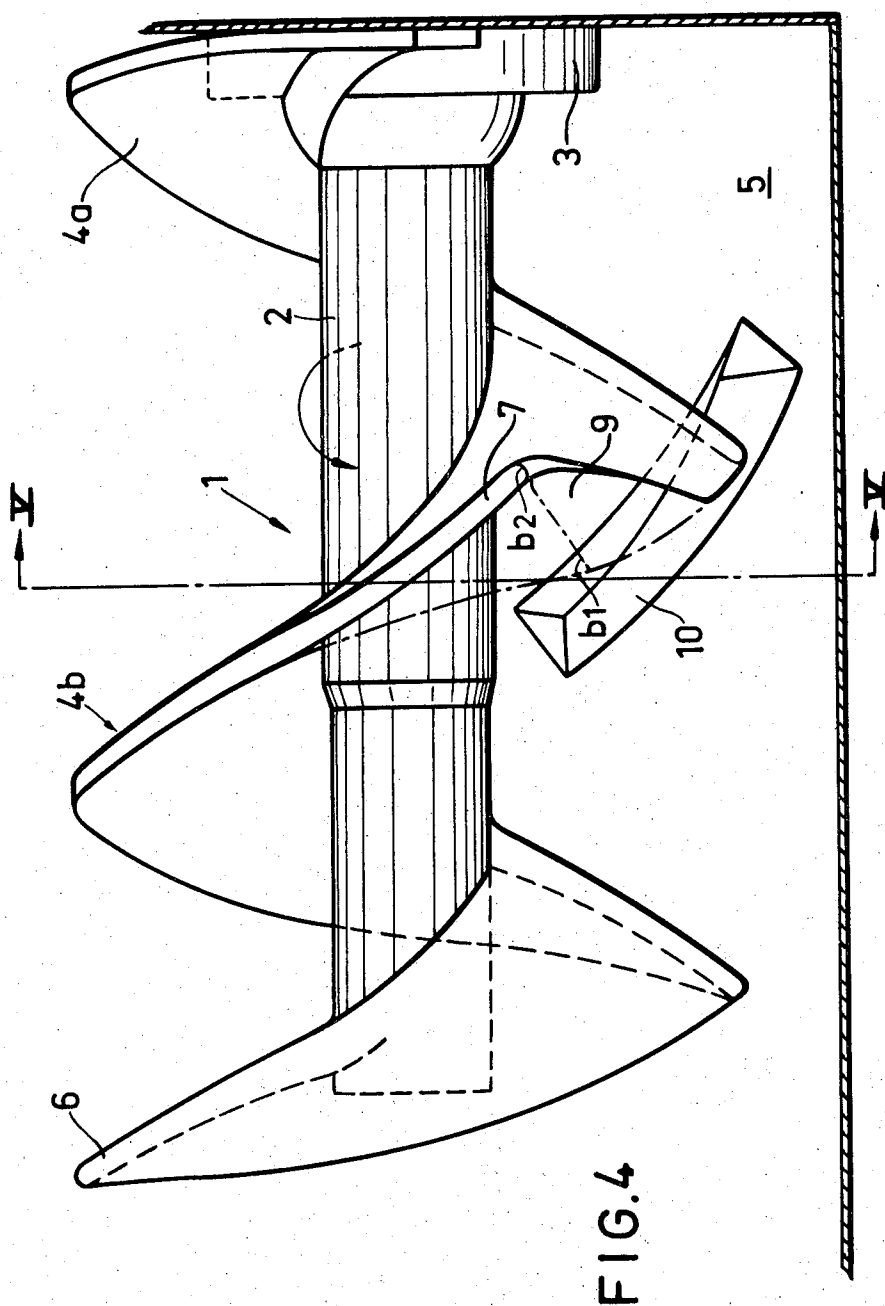


FIG.3



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COMPRESSING FEED SCREW

This invention relates to a compressing feed screw which comprises a tubular shaft and a helical screw blade secured thereto and which is particularly intended for feeding in and compressing refuse in a refuse container which preferably forms part of a refuse collecting vehicle.

On account of the changed nature and composition of domestic and other kinds of refuse which has to be collected and transported away increased difficulties in the feeding operation of the screw have been encountered. Thus, comparatively large boxes of cardboard or the like which may be filled with paper or similar light material are increasingly comprised in the refuse. Ordinary feed screws of the prior art get no hold on such light and voluminous objects which on account of their lightness and rigidity slidingly ride on the circumference of the screw blade and remain stationary in the inlet opening where they form a clogging obstruction.

The principal object of the invention is to eliminate this drawback of the feed screws of the prior art and to provide a screw of the kind in question which is more suited for the feeding and compressing of comparatively large and light objects, such as cardboard boxes, while retaining the same ability as ordinary screws in respect of feeding ordinary or small-sized waste or materials. The increase in the costs of production of this screw in relation to those of the old one is very insignificant, particularly if the above advantages are taken into consideration without forgetting certain indirect advantages which reside in the rapidity of feeding and the saving of time which is for the benefit of the operator.

With the above and other objects in view, the feed screw according to the invention is primarily characterized in that the screw blade comprises at least two portions which are separated from each other by a gap or an interval.

Further features and advantages of the invention will become apparent from the following description and the annexed drawings, which diagrammatically and as non-limiting examples illustrate some preferred embodiments and in which:

FIG. 1 is a perspective view of a feed screw according to the invention;

FIGS. 2 and 3 are an end view and a plan view, respectively, of a second embodiment of the screw;

FIGS. 4 and 5 are a side-view and a sectional view on the line V—V in FIG. 4 of a modification of the screw according to FIGS. 2 and 3.

The compressing feed screw which is generally designated 1 comprises a tubular shaft 2 which is provided with means 3 for rotating the shaft. Around this shaft 2 there is provided a first flight or blade portion 4a which extends around the shaft 2 with a considerable pitch. This flight portion 4a is attached to the shaft 2 by means of welding or a similar mechanical connection.

Parallel to this first flight portion 4a which forms part of the inlet end of the feed screw, there is provided a second flight portion 4b which is also helicoidal in shape but may have a varying pitch. In particular, this pitch might be important to begin with but may diminish towards the outlet end 6 of the feed screw.

This second flight portion 4b has an increasing height or radial extension. This height is insignificant to begin with as is shown at 7 and reaches gradually a dimension which corresponds to the radius of curvature of the trough (not shown), in which the feed screw is located.

This arrangement brings about numerous advantages.

The box or container 8, e.g. of cardboard, which is introduced into the feeding-in opening does not meet any portion of the circumferential edge of the feed screw in the critical instant. The gap or interval 9 between the two flight portions 4a, 4b is sufficiently large for receiving boxes of great dimensions. Said box 8 is first entrained by the flight portion 4a which if necessary collapses the box or splits it partially. As the box is thus engaged, it is the flight 4b which intervenes, particularly with its initial portion 7. This initial portion 7 is preferably adapted to penetrate into the box or into any other similar material and to force it to take part in the feeding-in movement. As the height of the helical flight increases, the refuse in the box 8 is compulsively advanced towards the outlet end of the screw for becoming definitely evacuated into the refuse container.

In FIGS. 2 and 3 which illustrate a second embodiment of the invention and in which the respective counterparts to the members of the embodiment according to FIG. 1 are designated with the same reference numerals, there is additionally shown a trough 5 in which the feed screw 1 is located and which has a semi-cylindrical lower half which is co-axial with the screw 1. In FIGS. 2 and 3 the interval or gap 9 between the blade portions 4a, 4b does not extend as far as to the shaft 2 proper in radial direction. In other words, these blade portions are interconnected between the gap or recess 9 and the tubular shaft 2. Furthermore, that end of the outlet end portion 4b of the screw blade which is located nearest to the recess 9 is bent or deflected backwards and inwards, towards the inlet end of the feed screw, from the position shown in dash-dot lines in FIGS. 2 and 3, which corresponds to a true helix, to the position shown in full lines in said Figures.

Furthermore, the inlet end portion 4a of the screw blade is considerably shorter in circumferential direction in the embodiment according to FIGS. 2 and 3 than is the corresponding screw blade portion in FIG. 1.

Finally, the semi-circular wall of the trough 5 is provided with a ridge or cam 10 which is located right opposite to the recess 9 but, of course, radially outwardly thereof.

The embodiment according to FIGS. 4 and 5, in which the same reference numerals as in the preceding Figures designate the same or corresponding details, differs from that according to FIGS. 2 and 3 substantially only therein that the inlet end portion 4a of the screw blade has a longer extension in the circumferential direction than is the case in FIGS. 2-3. That end of the outlet end portion 4b of the screw blade which is located nearest to the recess 9 is bent or deflected along the line b1 - b2 from the position shown in dash-dot lines to the position shown in full lines in FIG. 4.

The embodiments described above and illustrated in the drawings are, of course, to be regarded merely as non-limiting examples and may as to their details be modified in several ways within the scope of the follow-

ing claims. Thus, the number of screw blade portions and gaps or intervals separating the same may be three and two, respectively, instead of two and one, respectively. Furthermore, other embodiments which are also encompassed by the claims may be created by a combination of details taken from different ones of the embodiments disclosed.

We claim:

1. In a refuse vehicle a compressing feed screw which comprises a tubular shaft and a helical screw blade secured thereto which is particularly intended for feeding in and compressing refuse in a refuse container, said screw blade comprising at least two portions, an inlet portion and an outlet portion, which are separated from each other by a gap, said gap extending from the outer periphery of the screw blade to the tubular shaft proper so that a gap is formed in the joint between the tubular shaft and the respective portions of the screw blade and wherein the end of the outlet end portion of the screw blade which is located nearest to the gap has a smaller radial height than the remainder of said por-

tion of the screw blade.

2. The compressing feed screw of claim 1 wherein the portion of the screw blade which is located between the outlet end of the screw and said gap has a smaller pitch than has the blade of the inlet end of the screw.

3. An apparatus for feeding in and compacting a compressible material, such as refuse, in a container comprising a feed screw including a central rotatable shaft and a screw blade secured thereto and having a substantially triangular recess in its circumferential edge, a trough-like duct having a bottom portion which substantially conforms to at least a portion of the contour of the screw blade, said screw blade being positioned in said duct, and at least one substantially helical ridge having substantially the same extension in the circumferential direction of the screw blade as said recess provided in said duct and projecting in the direction toward the circumferential edge of said screw blade for disintegrating bigger objects advanced by said screw blade in cooperation therewith.

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