

D. LOW AND A. R. THOMPSON.
 ASPARAGUS SIZING MACHINE.
 APPLICATION FILED JAN. 17, 1920.

1,333,858.

Patented Mar. 16, 1920.

4 SHEETS—SHEET 1.

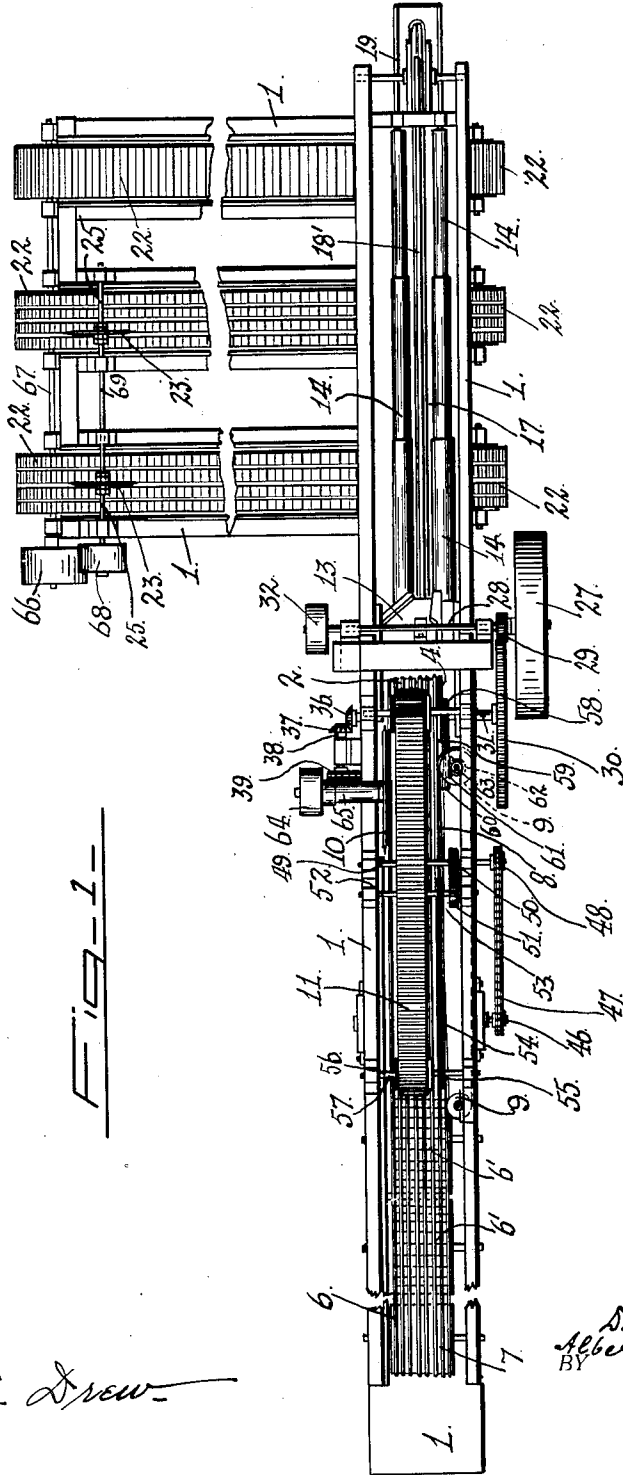


Fig. 1

WITNESS

Wm. H. Drew

INVENTORS
 David Low
 Albert R. Thompson

BY *Booth & Booth*

ATTORNEYS

D. LOW AND A. R. THOMPSON.
 ASPARAGUS SIZING MACHINE.
 APPLICATION FILED JAN. 17, 1920.

1,333,858.

Patented Mar. 16, 1920.
 4 SHEETS—SHEET 2.

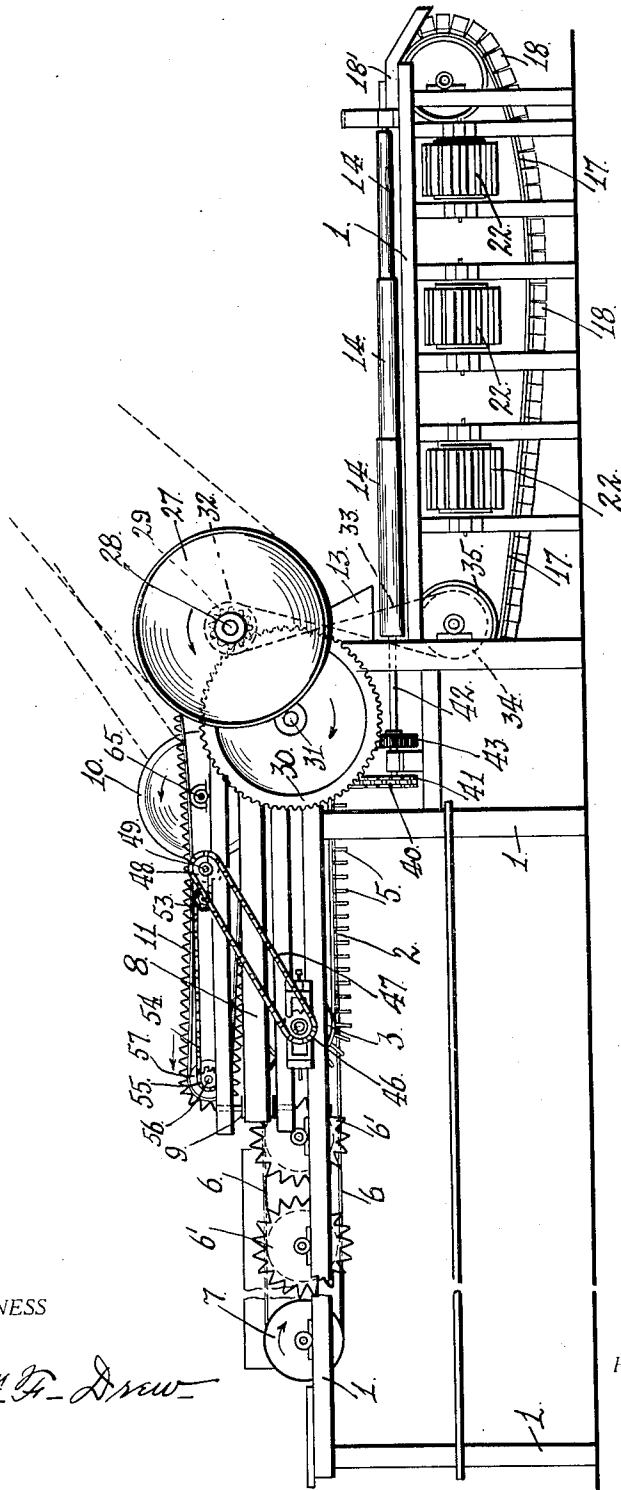


FIG. 2-

WITNESS

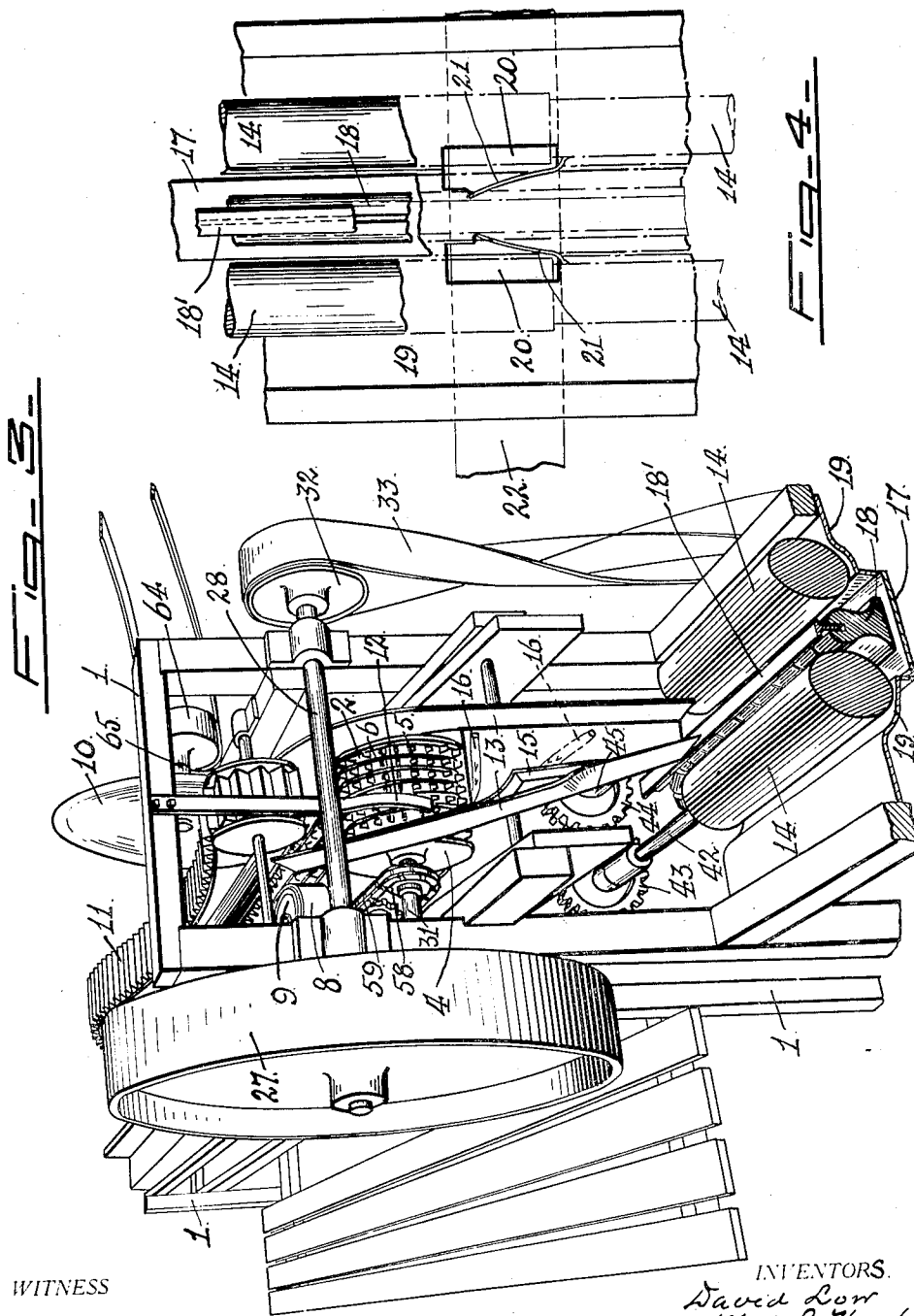
Wm. H. Drew

INVENTORS.
David Low
Albert R. Thompson
 BY *Booth & Booth*
 ATTORNEYS

D. LOW AND A. R. THOMPSON.
 ASPARAGUS SIZING MACHINE,
 APPLICATION FILED JAN. 17, 1920.

1,333,858.

Patented Mar. 16, 1920.
 4 SHEETS—SHEET 3.



WITNESS

Wm. F. Drew

INVENTORS.

David Low
 BY *Albert R. Thompson*

Booth Booth

ATTORNEYS

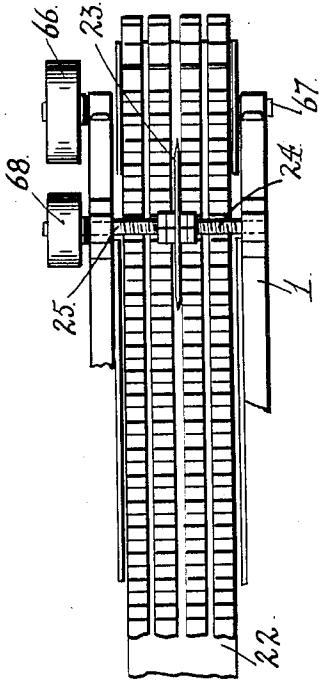
D. LOW AND A. R. THOMPSON.
 ASPARAGUS SIZING MACHINE.
 APPLICATION FILED JAN. 17, 1920.

1,333,858.

Patented Mar. 16, 1920.

4 SHEETS—SHEET 4.

FIG-6-



WITNESS

Wm. D. Low

FIG-7-

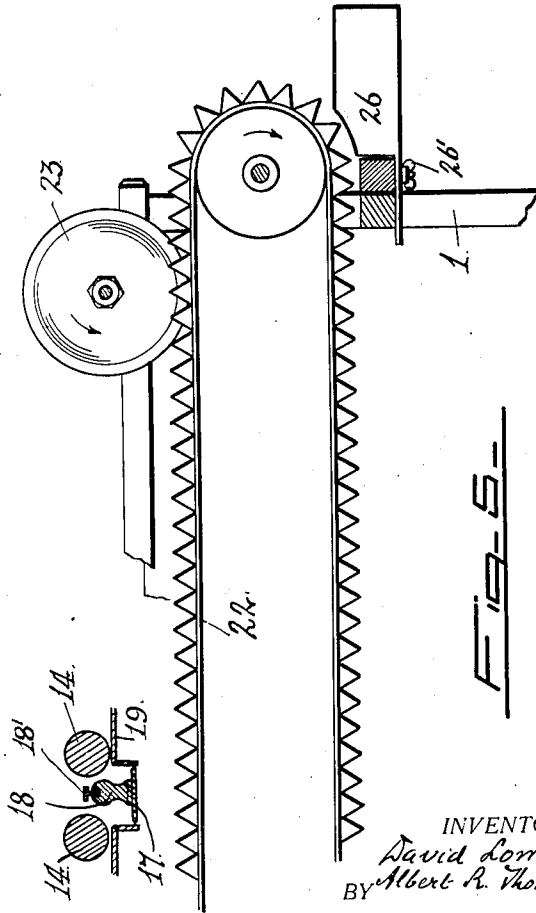
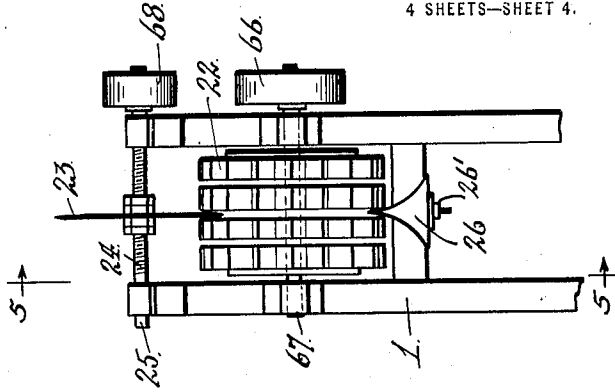


FIG-8-

INVENTORS,
David Low
 BY *Albert R. Thompson*
Booth & Booth
 ATTORNEYS

UNITED STATES PATENT OFFICE.

DAVID LOW AND ALBERT R. THOMPSON, OF SAN JOSE, CALIFORNIA; SAID THOMPSON
ASSIGNOR TO SAID LOW.

ASPARAGUS-SIZING MACHINE.

1,333,858.

Specification of Letters Patent. Patented Mar. 16, 1920.

Application filed January 17, 1920. Serial No. 352,207.

To all whom it may concern:

Be it known that we, DAVID LOW and ALBERT R. THOMPSON, citizens of the United States, residing at San Jose, in the county of Santa Clara and State of California, have invented certain new and useful Improvements in Asparagus-Sizing Machines, of which the following is a specification.

Our invention relates in general to canning machinery, and in particular to machines especially adapted for the preparation of asparagus. In previous patents, to which we shall hereinafter more particularly refer, we have discussed the efficiency value of the essential feature in any handling of asparagus, namely, the initial uniformity of the stalks or shoots with respect to butts and tips, and the maintenance of this uniform relation throughout the steps and operations of the handling machines, in order that the shoots shall be fed individually to the machine with their tips extending all in one direction; shall be then, by pressure on the tips lined or evened with respect to said tips; shall then have their butts cut off to reduce the shoots to a uniform length; shall then be delivered in the same relation with respect to butts and tips to a grading instrumentality to sort them as to thickness; and finally shall, still in this given butt-tip relation, be delivered from the machine.

In Letters Patent of the United States No. 1,299,198, dated April 1, 1919, we have disclosed a feeder mechanism adapted to supply individual shoots to a handling machine. In Letters Patent of the United States No. 1,257,719, dated Feb. 26, 1918, we have disclosed a machine for reducing the shoots or stalks to uniform length and then sorting them according to thickness. In Letters Patent of the United States No. 1,282,250, dated Oct. 22, 1918, we have disclosed a machine for first sorting the shoots according to thickness, and then reducing them to uniform length. In all these machines the essential factor is the maintenance of the relation of tips and butts of the shoots, the only individual care in this respect being on the part of the operator in initially placing the shoots in the machine; a proceeding easy enough because of the fact that the asparagus comes from the grower in boxes so

packed that the tips lie all in one direction. After the shoots are supplied to the machine in this relation with respect to tips and butts, the machine itself, throughout its several functions maintains this relation and delivers the prepared shoots in this relation so that they can be efficiently handled in subsequent processes of canning. In view of the foregoing explanation our present invention will be more readily understood. In the previous machines we were content with the reduction to uniform length and sorting for thickness. But in the canning art there is one step more, which is known as the re-cut of the grades. That is, to say, the several grades of uniform length which may be initially cut for two and a half squares, are themselves again cut according to whether they are to be placed on the market as No. 1 talls; No. 2, talls, or as tips. It is the object of our present invention to provide for this re-cut from any grade and to do this in a complete organized machine, in which the feeder, the uniform length cutter and the grader, while presenting in themselves individual devices substantially like those heretofore patented by us, enter generically as elements in the organized machine, with the re-cut instrumentality, the latter being so related to the preceding elements as to still carry out the essential feature in the law of the machine, namely, the maintenance of the relation of tips and butts, to which relation the efficiency of the machine is due.

Accordingly, our invention consists in the novel machine hereinafter fully described, and which from its complete function we have deemed it appropriate to entitle, asparagus sizing machine, in that it prepares the asparagus in the several sizes which the market demands. In illustrating and describing our present complete machine, we have necessarily repeated much that is disclosed in our former patents with such minor changes as better adapt the prior devices to the incorporation and addition of the grade-re-cut feature.

In the accompanying drawings, to which reference is now made,

Figure 1 is a top-plan of our machine.

Fig. 2 is a side-elevation of the same.

Fig. 3 is a perspective view, enlarged, of that portion of the machine in which the

asparagus stalks or shoots drop from the uniform-length mechanism onto the grading instrumentality.

Fig. 4 is a detail plan view broken and enlarged showing the means for discharging the shoots from the grader.

Fig. 5 is a skeleton, sectional view on the line 5—5 of Fig. 7, showing the relation of the grader to the cross carriers upon which the uniform-length and graded shoots are finally re-cut into such lengths as the trade requires.

Fig. 6 is a top-plan of one of the cross carriers and its cutter.

Fig. 7 is an end view of the same.

1 is the general frame of the machine. 2 is an endless carrier, which for convenience, we shall herein term the main-carrier. It is mounted upon a head-pulley 3, shown best in Fig. 2, and upon a foot pulley 4 shown best in Fig. 3. This carrier comprises a flexible endless formation of suitable character with transverse rows of spaced cleats 5 upon its face, the spaces between the rows of cleats forming pockets in which the individual asparagus shoots or stalks may lie transversely of the carrier, and in which they may be shifted endwise.

The shoots are fed to the main carrier 2 by a plurality of endless traveling parallel belts 6, which at their head ends are mounted upon a pulley 7. These feed belts thence pass to and lie upon the main-carrier 2, in the spaces between the cleats 5 of said carrier, as seen clearly in Fig. 3, said feed belts passing with said carrier around the foot-pulley 4 thereof.

Mounted upon the frame 1 in advance of the main-carrier head-pulley, are the toothed spreader disks 6', the teeth of which pass up between parallel feed belts 6.

8 is an endless traveling tip-evener belt mounted edgewise beside the advancing portion of the main carrier. This belt is carried by terminal pulleys 9 and lies at an angle to the plane of the side of the main carrier converging to the latter in the direction of travel.

10 is the butt-evener cutter, consisting of a disk mounted vertically beside the main carrier on the side opposite the tip-evener belt 8.

11 is an endless traveling presser belt overlying the main carrier and adapted to hold the asparagus shoots or stalks down in the pockets of said carrier.

In Fig. 3, to which reference may now be had, 12 is a spring finger which overlies one side of the main carrier, as it passes around its foot-pulley.

13 is a chute embracing at its upper end the foot or discharge of the main carrier, and thence leading downwardly to the head end of the grader rolls 14. One wall of the chute 13, namely, that which is on the same side as the spring finger 12 is formed or provided

with an inwardly projecting deflector or retarding portion 15. It will be well, at this point, to state that the asparagus shoot lying in the pocket of the main carrier 2 presents its tip end under the spring finger 12.

By said finger the tip end is momentarily held back, while the butt-end being free drops out a moment before the tip end is released. Such a shoot in this position is shown at 16, in Fig. 3, and indicates the beginning of a turning of the shoot from a transverse position to a position at right angles, that is longitudinal. Then the tip end of the shoot meeting the deflector 15 is sufficiently retarded to cause the butt end to swing down, thus throwing the shoot, as shown in dotted lines, to a longitudinal position in which position it drops through the chute to the grader rolls.

The grader rolls 14 are of a common form of stepped-rolls, as shown in Figs. 1 and 2. Between the rolls and underlying them is an endless traveling belt 17, having a width sufficient, as shown in Figs. 3, 4 and 5, to form a traveling platform upon which the shoots, falling between the rolls rest and advance. This belt 17 carries a series of blocks 18, the heads of which rising between the rolls define a grading space on each side, so that shoots may fall down through said spaces on each side of the block and rest upon the belt sides. A stationary T-guide 18' fits a continuous slot in the belt blocks 18 and serves to hold said belt and blocks straight, and thus keep the grading spaces uniform. 19 is a floor sheet under the rolls to keep the shoots from falling off the belt-sides.

As shown in Fig. 4, there is at the end of the step of the grader rolls a cut out in the floor sheet 19 forming an opening 20 on each side; and these openings are inwardly flanked by a fixed deflector switch 21 so that when a shoot reaches the switch 21, it is deflected from the belt 17 into the opening 20 and drops through said opening. There is a pair of these openings below the end of each step of the grader rolls, though but one pair is shown in Fig. 4.

Under the grader rolls and at right angles thereto are the cross-carriers 22, which we shall herein conveniently term the re-cut carriers. These are each composed of a flexible foundation with parallel rows of spaced cleats, as seen clearly in Figs. 6 and 7. In Fig. 1, we have so shown two of these re-cut carriers, the third being similar, but not completed as to spaced cleats, nor is the re-cut knife or cutter shown on this third cross carrier.

Above each of these cross carriers 22 is a rotatable cutter 23, which is carried adjustably, as shown by the screw threads at 24 in Figs. 6 and 7, on its shaft 25, whereby it may be set to operate between any of the

intercleat spaces, according to the particular re-cut desired.

At the end of each cross-carrier 22 is a separating member 26, Figs. 5 and 7, which by means of the set screw 26' may be set to any intercleat space to insure the division of the recut sections.

Though the particular driving mechanism is not an essential, it will be well to briefly describe the form here shown to complete the organized machine. Power is led in to a pulley 27, Figs. 1 and 2 on a cross-shaft 28. On this shaft is a pinion 29 which meshes with a gear 30, on a shaft 31 which carries the foot pulley 4 of the main carrier 2. Thus the main carrier 2 is driven as well as the feed-belts 6 which lie on said carrier.

On the other end of the cross-shaft 28 is a pulley 32, from which a crossed-belt 33 (Fig. 3) passes down to pulley 34 (Fig. 2) on the head drum 35 of the grader belt 17, and said belt is thus driven.

Upon the end of the shaft 31 opposite to the end which carries the gear 30, is a bevel pinion 36 (Fig. 1) which meshes with a bevel pinion 37 on a counter-shaft 38, the other end of which shaft carries a sprocket 39, from which a chain 40 (Fig. 2) passes to a sprocket 41 on the shaft 42 of one of the grader-rolls. On this shaft is a gear 43, which as shown in Fig. 3 meshes with a gear 44 on the shaft 45 of the other grader-roll. By these connections the grader-rolls 14 are driven.

The presser belt 11 is driven as follows: On the shaft of the head pulley 3 of the main-carrier 2 is a sprocket 46 from which a chain 47 passes up to a sprocket 48 on a counter-shaft 49. Figs. 1 and 2. This shaft 49 carries a gear 50 which meshes with a gear 51 on a second counter-shaft 52 (Fig. 1) which latter shaft carries a sprocket 53 from which a chain 54 passes to a sprocket 55 on the shaft 56 of the head drum 57 of the presser-belt 11.

The tip-evener belt 8 is driven as follows: On the shaft 31 of the foot-pulley 4, of the main carrier 2 is a sprocket 58 (Fig. 3) from which a chain 59 passes to a sprocket 60 (Fig. 1) which carries a bevel gear 61, meshing with a bevel gear 62 on the shaft 63 of one of the terminal pulleys 9 of the evener belt 8.

The butt-cutter 10 is driven from a separate pulley 64 on its shaft 65 (Fig. 1).

The re-cut or cross carriers 22 are driven from a pulley 66 on their pulley-shaft 67, Figs. 1, 6 and 7. The grade-re-cut cutters 23 are driven by a pulley 68 on the shaft 69, Figs. 1, 6 and 7.

The spreader disks 6' are to be driven in any suitable manner. As these disks and their function form the subject matter of Patent No. 1,299,198, hereinafter referred to, and do not in their specific form consti-

tute part of our present invention we have not deemed it necessary to show their driving connections.

The complete operation of the organized machine is as follows: The asparagus shoots or stalks are placed by the operator upon the feed belts 6. In thus feeding them his essential care is only to see that all the tips are in the same direction and all the butts are in the other direction, the tips all facing toward the presser belt side of the machine. By the feed belts the shoots are advanced, and by the action of the toothed spreaders 6' the groups are broken up, as explained in our Patent No. 1,299,198, and by the time they reach the head of the main carrier, they are well separated and are picked up individually, successively, by the uprising pockets of the carrier, one shoot lying in each pocket. As the shoots advance with the carrier, their projecting tips contact with the evener belt 8 and by the gradual convergence of said belt to the path of travel of the main carrier, the shoots are shifted endwise in the pockets of the carrier, to a given line, so that all the tips are evened. Then the cutter 10 severs the butts evenly; the presser belt 11 above, serving to keep the shoots stable under the operations of sliding and butt-cutting. Thus the shoots are all cut to an initial even and uniform length, as in our Patent No. 1,257,719, hereinbefore referred to.

When the shoots reach the foot of the main carrier, they drop out of the carrier pockets, and, due to the spring finger 12, and the retarding projection 15, the stalks in falling through the chute 13, are turned through an arc of 90 degrees, so that they are delivered to the grader longitudinally, but still with their tips in the same direction. In the grader, the shoots according to thickness drop down through the grading spaces of the several steps of the grader rolls 14, and are by the belt 17 carried to their respective openings 20, through which by means of the switches 21 they pass to the pockets of the cross-carriers 22, the shoots still maintaining their relation as to tips and butts. Upon these cross-carriers, the several grades are advanced to the cutters 23, by which they are re-cut. By the adjustment of the cutters 23, any grade may be cut into the length desired, as for example, No. 1, tall; No. 2, tall; or tips. From the cross carriers these re-cut lengths are delivered uniformly with respect to ends and may be thus effectively handled.

We claim:

1. An asparagus sizing machine comprising means for reducing the shoots to uniform length and grading them for thickness; means for re-cutting the graded and uniform-length shoots into different lengths; and means for maintaining the

shoots throughout their progress through the machine in a given relation with respect to their butts and tips.

2. An asparagus sizing machine comprising means for feeding the asparagus shoots into the machine, with their tips lying in the same direction; means for lining up said tips and cutting off the butts to reduce the shoots to uniform length; means for delivering the shoots from the uniform-length means with their tips and butts still in the same relation; a sorting means to which said shoots are delivered in said relation, whereby they are graded according to thickness; means for delivering the graded shoots from the sorting means in the same relation with respect to tips and butts; and re-cutting means to which the graded shoots are delivered by the sorting means, whereby they are cut into desired lengths.

3. An asparagus sizing machine comprising means for feeding the asparagus shoots into the machine, with their tips lying in the same direction; means for lining up said tips and cutting off the butts to reduce the shoots to uniform length; means for delivering the shoots from the uniform-length means with their tips and butts still in the same relation; a sorting means to which said shoots are delivered in said relation, whereby they are graded according to thickness; means for delivering the graded shoots from the sorting means in the same relation with respect to tips and butts; and re-cutting means to which the graded shoots are delivered by the sorting means, whereby they are cut into desired lengths, consisting of traveling carriers, and cutters associated with said carriers and adjustable along the length of said shoots.

4. An asparagus sizing machine comprising means for feeding the asparagus shoots into the machine, with their tips lying in the same direction; a carrier for advancing the shoots; means associated with said carrier for lining up said tips and cutting off the butts to reduce the shoots to uniform

length; grading rolls associated with the discharge end of the carrier and in line with said carrier; means associated with the carrier and grading rolls for delivering the uniform-length shoots from the carrier to the grading rolls in the same relation with respect to tips and butts; a cross carrier under each division of the grading rolls; means associated with the grading rolls and each cross-carrier for delivering the different grades of the shoots from the rolls to the carriers in the same relation with respect to tips and butts; and cutters associated with said cross carriers, whereby the shoots are re-cut into desired lengths.

5. An asparagus sizing machine comprising means for feeding the asparagus shoots into the machine, with their tips lying in the same direction; a carrier for advancing the shoots; means associated with said carrier for lining up said tips and cutting off the butts to reduce the shoots to uniform length; grading rolls associated with the discharge end of the carrier and in line with said carrier; means associated with the carrier and grading rolls for delivering the uniform-length shoots from the carrier to the grading rolls in the same relation with respect to tips and butts; a cross carrier under each division of the grading rolls; means associated with the grading rolls and each cross carrier for delivering the different grades of the shoots from the rolls to the carriers in the same relation with respect to tips and butts; and cutters associated with said cross-carriers whereby the shoots are re-cut into desired length, said cutters being adjustable along the length of the shoots to vary the re-cut lengths.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

DAVID LOW.

ALBERT R. THOMPSON.

Witnesses:

JOHN MONNET,

F. C. BROWN.