April 6, 1926. 1,579,598

W. DE BACK

SORTING AND CUTTING MACHINE

Filed March 31. 1923 3 Sheets-Sheet 1

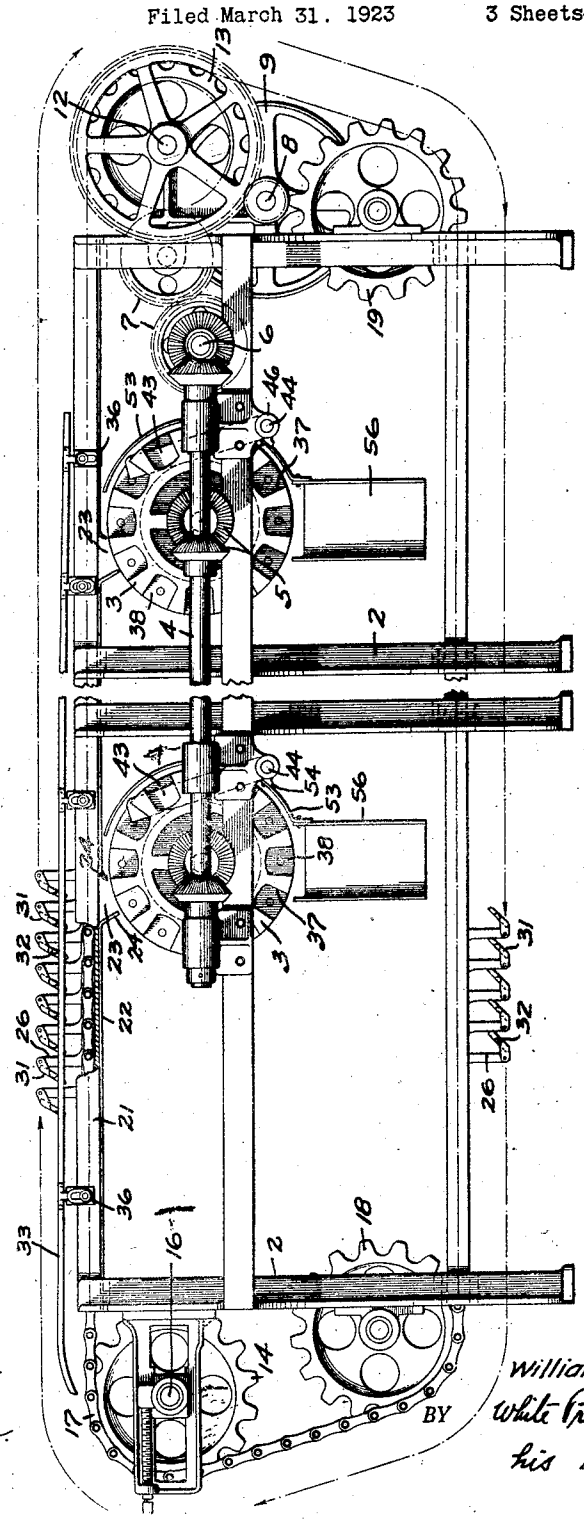


FIG. 1.

WITNESS:
H. S. Sherburne

INVENTOR.
William de Back
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Filed March 31, 1923 3 Sheets-Sheet 2

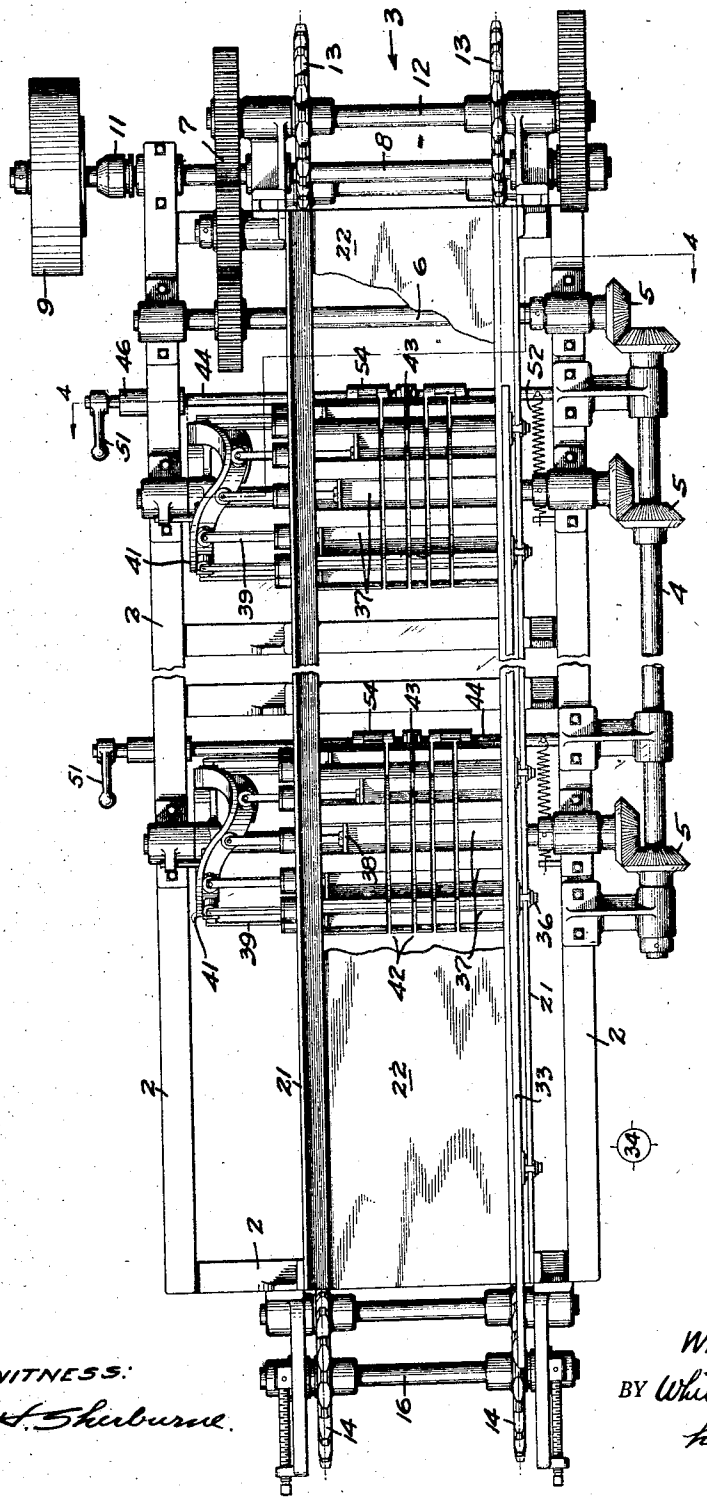


FIG. 2.

WITNESS:
H. Sherburne.

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Filed March 31. 1923 3 Sheets-Sheet 3

FIG. 5.

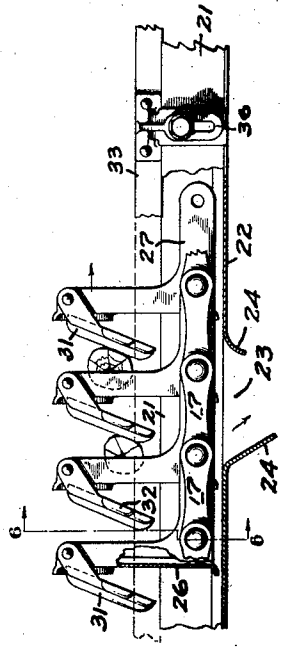


FIG. 4.

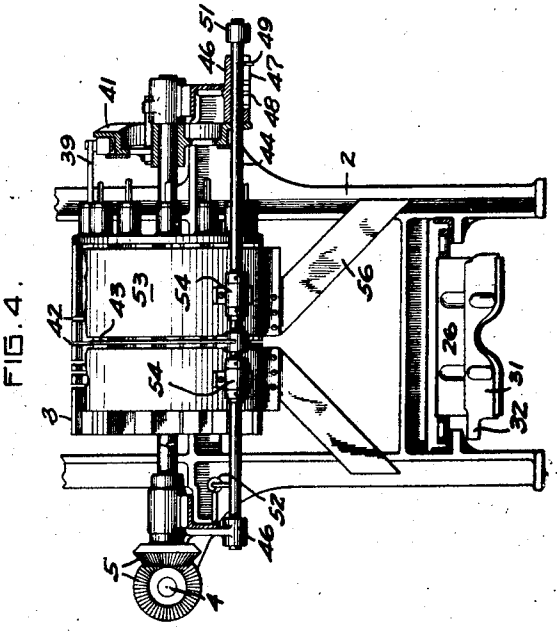


FIG. 6.

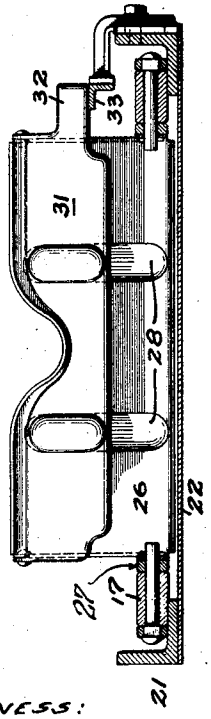
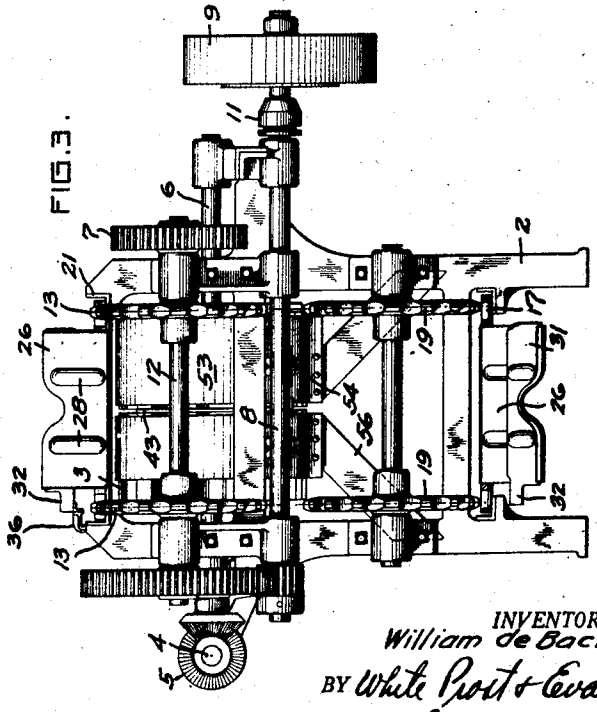


FIG. 3.



WITNESS:
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William de Back
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Patented Apr. 6, 1926. 1,579,598

UNITED STATES PATENT OFFICE.

WILLIAM DE BACK, OF ISLETON, CALIFORNIA.

SORTING AND CUTTING MACHINE.

Application filed March 31, 1923. Serial No. 629,020.

To all whom it may concern:

Be it known that I, WILLIAM DE BACK, a citizen of the United States of America, and a resident of Isleton, county of Sacramento, and State of California, have invented a new and useful Sorting and Cutting Machine, of which the following is a specification.

The invention relates to apparatus for cuttting and sorting articles and one of the objects of the invention is the provision of a machine for sorting and cutting asparagus.

Another object of the invention is the provision of a machine of the character described which is readily adjustable so that it can be quickly adapted to the characteristics of the material which is to be handled.

Another object of the invention is the provision of a machine of the character described which is entirely automatic in action, taking the asparagus as it is fed to it, sorting it for size, cutting it to separate the edible top from the fibrous lower portion of the stalk, and delivering the tops and the waste portions at separate points.

The invention possesses other objects and features of advantage, some of which, with the foregoing, will be set forth in the following description of the invention. It is to be understood that I do not limit myself to the showing made by the said description, as I may adopt variant forms of the invention within the scope of the claims.

Referring to the drawings: Fig. 1 is a side elevation of the machine a portion thereof being broken away to shorten the figure. Fig. 2 is a plan view of the structure shown in Fig. 1, portions being omitted to better disclose the remaining structure. Fig. 3 is an end elevation of the machine taken from the direction indicated by the arrow 3 in Fig. 2. Fig. 4 is a vertical sectional view, the plane of section being indicated by the line 4—4 of Fig. 2. Fig. 5 is a side elevation on a larger scale of a portion of the conveyor and sorting mechanism. Fig. 6 is an elevation and vertical sectional view taken in the plane indicated by the line 6—6 of Fig. 5.

In terms of broad inclusion the invention comprises a series of carriers, one for each of the sizes into which the asparagus is to be sorted. Each carrier moves forwardly from a loading point to a discharge point, and is formed with longitudinal grooves, as well as grooves transverse thereto. A sorting conveyor is arranged to run over the carriers. Asparagus is fed upon the conveyor, with the heads in one direction, and as the conveyor passes over the carriers the asparagus is sorted according to size and deposited in the longitudinal grooves of the carriers. Associated with each carrier is a cutting blade which lies in one of the transverse grooves thereof, and, as the carrier moves forwardly, the asparagus in the longitudinal grooves is pressed against the cutting blade and severed. The edible head and the waste portion of the stalk are subsequently deposited in separate chutes and discharged from the machine. In order that the stalks may be cut at the proper point it is necessary to position the pieces in the longitudinal grooves, and this is done by an automatically operated plunger arranged in each longitudinal groove, which presses against the head of the stalk, and moves it to the desired position relative to the cutting blade. Means are provided for mounting the cutting blade so that it may be readily shifted from one transverse groove to another to vary the length of the edible portions of the stalks in accordance with the condition of the material.

In detail, the invention comprises a frame 2, in which a series of carrier drums 3 are journaled. A shaft 4 connected by suitable miter gears 5 with each drum, is driven by a shaft 6, which in turn is driven thru a suitable gear train 7, from the main driving shaft 8, having the pulley 9, belted to any suitable source of power. A clutch 11 is preferably interposed between the pulley and the shaft. The drawings show two carrier drums but it is to be understood that as many carrier drums may be included in the machine as the number of sizes into which it is desired to sort the asparagus. One of the gears of the train 7 is fixed on a shaft 12 which also carries a pair of sprockets 13. At the opposite end of the machine sprockets 14 are arranged on the shaft 16, and these sprockets 13 and 14 carry the upper reaches of twin endless chains 17, on which the sorting conveyor is arranged. The lower reaches of the chains run around the sprockets 18 and 19 suitably mounted on the frame of the machine below the sprockets 14 and 13 respectively. The upper reaches of the conveyor chains run in angle irons 21, and a flat plate or table 22, best

shown in Fig. 6, underlies the angle irons, and is provided with an aperture 23 over each of the carrier drums. A guard flange 24 extends downwardly from the table on each side of the aperture into close proximity to the carrier.

Automatically operating means are provided on the conveyor chains dropping asparagus thereon at predetermined points upon the table, in accordance with the size or diameter of the asparagus, and then sweeping the dropped stalks along to the next succeeding aperture 23 thru which they fall into the carrier drum. Arranged between the parallel reaches of the conveyor chains 17 are cross members formed preferably of sheet metal, and each one comprising a plate 26 preferably flanged about the edge to give added strength, and having the integral arms 27 on each side, suitably apertured to facilitate attachment to the links of the chain. The plate 26 as best shown in Figs. 5 and 6, extends close to the table 22, and is provided with suitable stiffening ribs 28. As the upper reach of the conveyor passes along the angle irons 21, each plate 26 extends upwardly in relatively fixed position as to the chain.

Pivotally mounted at the upper end of each of the fixed plates is a plate 31, which extends across the entire width of the fixed plate and inwardly toward the table 22, for perhaps half of its height. These pivoted plates are each provided with a projecting lug 32, which ride on a cam plate 33, the function of which is to control the angular relation of each pivoted plate with the adjacent fixed plate, that is to say, to control the space which separates the end of each pivoted plate from the adjacent fixed plate.

Each two plates thus co-operate to provide a trough-like support for an asparagus stalk placed upon the conveyor, and the varying width of the space separating the plates as the conveyor progresses over the carrier drums, determines the point at which stalks are dropped upon the table 22.

It should be noted that in feeding asparagus to the machine, one stalk at a time is placed between the supporting plates, as shown in Fig. 5, with the head pointing away from the operator who stands adjacent one end of the machine, as indicated by the reference character 34, Fig. 2. As shown in Fig. 6, both plates are recessed in their upper edges to facilitate the placing of the stalks or their removal. Dropping from the conveyor the stalks, which are within certain size limits, at predetermined points, is effected by the change in position of the pivoted plates as they ride along the cam 33. Preferably the cam comprises a piece of angle iron supported on bracket 36, and arranged at an angle, as shown in Fig. 1, to the direction of movement of the conveyor. At the point where the stalks of asparagus are placed upon the machine, that is the left hand side of the machine, as viewed in Fig. 1, the cam is highest so that the pivoted plates are held closer to the fixed plates. As the pivoted plates pass along the cam they are gradually permitted to fall, and separate more and more from the adjacent fixed plate. Thus the smallest size of stalk is permitted to drop first and then successively larger sizes are dropped upon the table as the conveyor progresses. As each stalk drops from between the two plates, it falls upon the table 22, and is caught by the lower portion of the fixed plate, and swept along the table to the next succeeding aperture 23, thru which it falls into the carrier drum.

Each of the carrier drums is provided with a series of closely spaced longitudinal slots 37, adapted to receive stalks of asparagus falling thru the apertures 23 as the carrier revolves. Slidably mounted in the far end of the slot, as viewed from the operator's side of the machine, is a plunger 38 arranged on a shaft 39 terminating in a roller adapted to engage a fixed cam 41. The cam is so formed that each plunger is in a retracted position until after the groove in which it operates has passed the aperture 23, thru which it receives a stalk of asparagus. Immediately after this point has been passed by the rotating carrier, the plunger is forced inwardly by the cam, engaging the head end of the stalk, and pushing it along the groove to a predetermined position therein. It will be understood that the stalks are of varying lengths and that it is desired to cut equal lengths from the head ends of the stalks so that such ends may be uniform for canning.

Means are provided for cutting the positioned stalks in the grooves and discharging the pieces separately. Each of the carrier drums is formed with transverse or circumferential grooves, preferably four in number. These grooves 42 are sufficiently wide to admit a cutting blade 43, preferably a knife. The knife does not touch any portion of the carrier and the cutting edge thereof is disposed, as shown in Fig. 1, tangentially in respect of the carrier and inside of or within the bottoms of the longitudinal grooves. As the carrier drums revolve, the stalks in the grooves thereof are drawn against the knife which effects a shearing cut thru them. The cutting blade is fixed on a shaft 44 mounted for both rotary and axial movement in bearings 46 on the main frame so that the blade may be readily shifted from one slot to another. One of the bearings 46, as shown in Fig. 4, is provided with a slot 47 intercepted by

cross slots 48, in which a pin 49 is adapted to be engaged. The spacing of the slots 48 in an axial direction corresponds with the spacing of the circumferential grooves 42, and the position of the slot 47 is such that axial movement of the shaft can take place only when the cutting blade is out of engagement with any of the circumferential grooves. A handle 51 on the shaft 44 provides means whereby the shaft may be oscillated to register the pin 49 with the slot 47, and then moved in an axial direction until the pin 49 engages in the desired cross slot 48, at which time the knife will be engaged in the corresponding circumferential groove. A spring 52, interposed between the frame of the machine and the shaft 44, resiliently holds the cutting blade in operative position in its groove.

A guard plate 53 is also mounted on the shaft by means of a bracket 54 on each side of the cutting blade so that the guard plate moves axially with the shaft when the cutting blade is shifted from one groove to another. At the lower end of the guard plate 53, is fixed a discharge chute 56, which delivers the pieces of the cut stalks out of the machine to a suitable receptacle or conveyor. The discharge chutes also move axially with the shaft 44 so that each one is always in position to catch a piece of stalk as it is released from the carrier drum.

I claim:

1. In a sorting and cutting machine, a carrier for each size of the article to be handled, means for sorting said articles into said carriers, means for positioning said articles in said carriers, a cutting blade associated with each carrier and against which the articles are pressed by the carrier, a shaft on which said blade is fixed, and means for varying the longitudinal position of the shaft to vary the length of the articles cut by the blade.

2. In a sorting and cutting machine, a carrier comprising a rotary drum formed with longitudinal grooves and circumferential grooves, means for depositing articles to be handled in the longitudinal grooves, means for positioning the articles in said longitudinal grooves, a longitudinal movable and oscillatable shaft parallel to the axis of said drum, a cutting blade fixed on said shaft and adapted to lie in a selected circumferential groove, and a discharge chute mounted on said shaft on each side of said blade.

3. In a sorting and cutting machine, a carrier comprising a rotary drum formed with longitudinal grooves and circumferential grooves, means for depositing articles to be handled in the longitudinal grooves, means for positioning the articles in said longitudinal grooves, a longitudinal movable and oscillatable shaft parallel to the axis of said drum, a cutting blade fixed on said shaft and adapted to lie in a selected circumferential groove, a guard plate enclosing the side of said drum mounted on said shaft on each side of said blade, and a discharge chute underlying the drum and fixed on each guard plate.

4. In a sorting and cutting machine, a carrier for each size of the article to be handled, a conveyor running over said carriers, fixed plates on said conveyor, pivoted plates on said conveyor co-operating with the fixed plates to support the articles to be handled, cam means for varying the position of the pivoted plates relative to the fixed plates so that the articles therebetween are deposited according to size into said carriers, and means for cutting the articles in the carriers to a predetermined length.

5. In a sorting and cutting machine, a carrier for each size of the article to be handled, a table overlying said carriers and provided with a discharge aperture over each carrier, a conveyor running over said table, fixed plates on said conveyor extending close to said table, pivoted plates on said conveyor co-operating with the fixed plates to support the articles to be handled, cam means for varying the position of the pivoted plates relative to the fixed plates so that the articles therebetween are deposited at predetermined points according to size upon said table and swept therealong by said fixed plates to said discharge apertures and into said carriers, and means for cutting the articles in the carriers to a predetermined length.

6. In a sorting and cutting machine, a carrier having longitudinal grooves therein, means for depositing articles to be handled in said grooves, a plunger in each groove and mounted on said carrier, means for cutting the articles in the grooves, and means for moving the plungers to position the articles relative to the cutting means.

7. In a sorting and cutting machine, a rotary carrier drum having longitudinal grooves therein, a plunger in each groove, a fixed cam for moving said plungers during the rotation of said drums to position articles in the grooves, and means for cutting the positioned articles.

In testimony whereof, I have hereunto set my hand.

WILLIAM DE BACK.