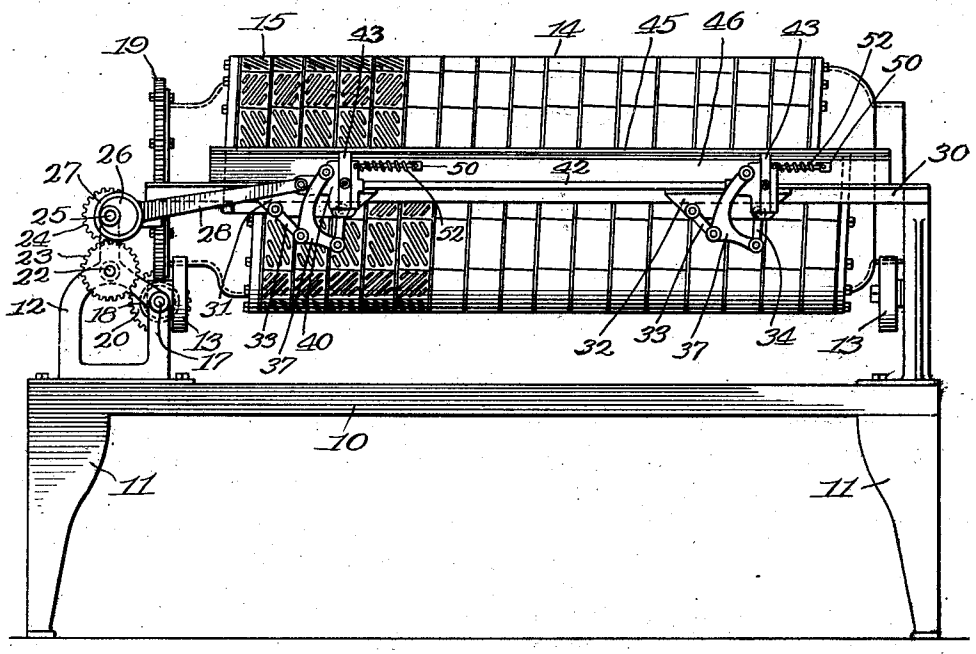
June 24, 1930. W. E. URSCHEL 1,765,952

BEAN SNIPPER

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Fig. 1



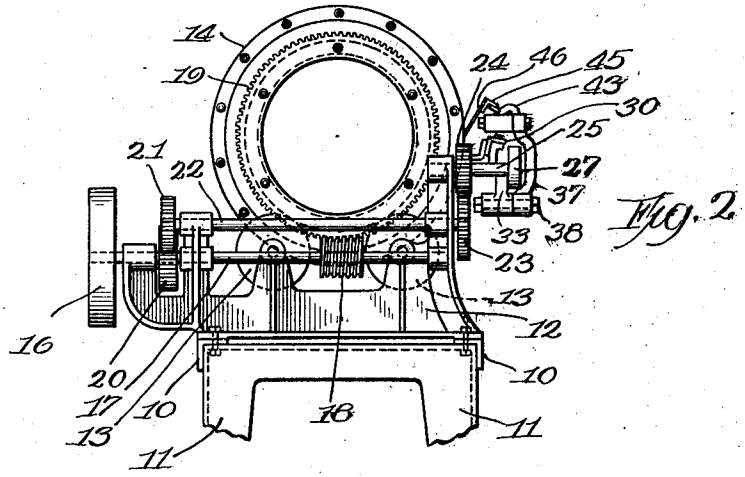


Fig. 2

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Fig. 3

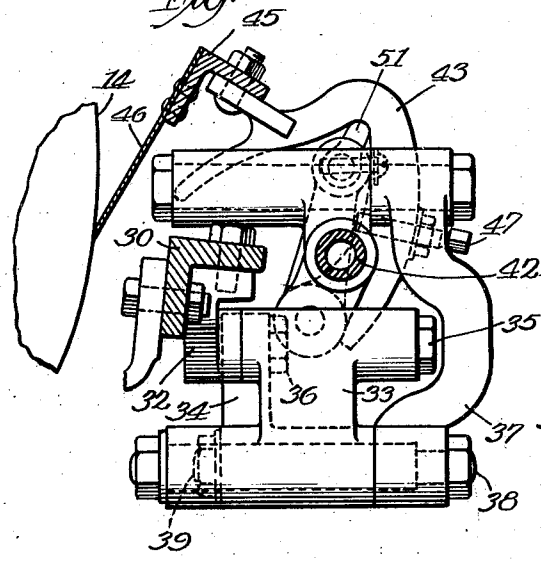


Fig. 5

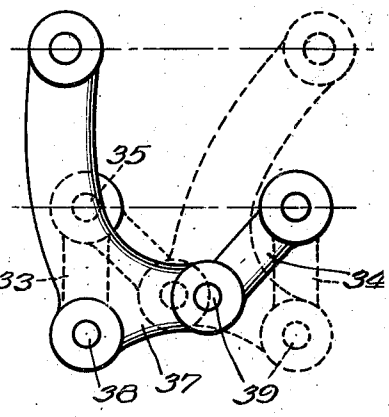
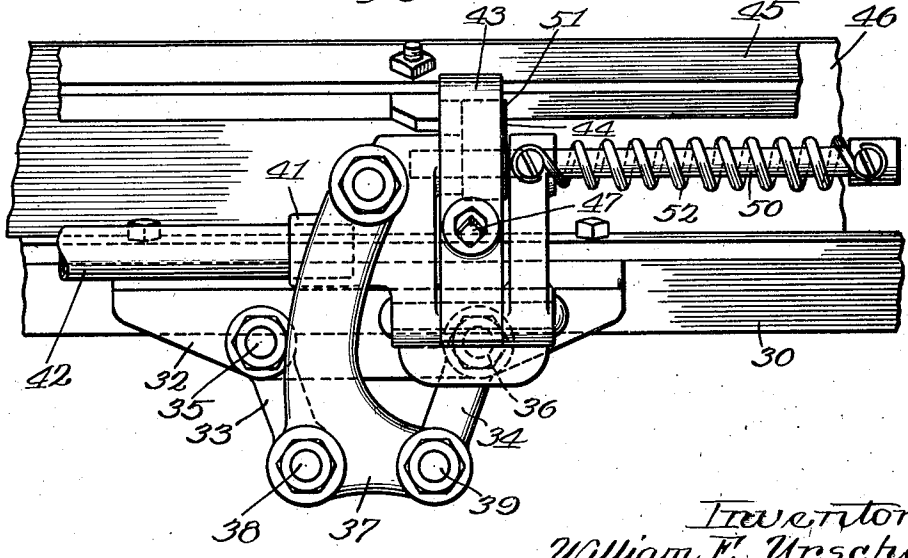


Fig. 4



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UNITED STATES PATENT OFFICE

WILLIAM E. URSCHEL, OF VALPARAISO, INDIANA

BEAN SNIPPER

Application filed July 17, 1926. Serial No. 123,175.

This invention relates in general to bean snippers and more in particular to an improved mechanism particularly designed for supporting the cutting knife thereof.

In my Patent No. 1,336,991, issued April 13, 1920, I described a machine for receiving what are commonly called string beans and automatically snipping the ends thereof. Among the essential features of the machine described therein was an improved type of cylinder having apertures therein through which the ends of the beans are adapted to project.

A knife of substantially the length of the cylinder was provided and rotation of the cylinder past the knife resulted in a snipping off of the projecting ends of the beans. The knife was mounted in a slide and a means was provided for reciprocating said knife in said slide.

The main portions of the bean snipper described in my prior patent just referred to actuate in a most desirable manner and these are preserved to the present time. I have found by repeated experiment and constant use since the time of filing application for my prior patent that the sliding members on which the knife is mounted can be improved, although in its original form it functions in a satisfactory manner.

Sand, earth, and other foreign matter sometimes lodge in the slides and tend to prevent or retard the movement thereof, and such gritty material may cause an abrasion of the metal surfaces and wear upon the sliding members. A reciprocation of the knife in the same horizontal plane, however, is very desirable.

One object of the present invention, therefore, is to provide a different and improved mechanism whereby said knife may be reciprocated in a horizontal plane.

Another object of the invention is the provision of an improved bean snipper embodying such mechanism.

A further object of the invention is the provision of an unique mechanical movement which may be employed for obtaining a reciprocatory movement of a member in a horizontal plane.

In carrying out the main features of the invention, I employ a rotating cylinder having aperatures therein through which the beans are adapted to project. This cylinder is fashioned in all its essential details in accordance with my prior patent referred to above. A knife extending substantially the full length of the cylinder is mounted on a plural lever pivot and is provided with means whereby it may be reciprocated longitudinally of said cylinder and on said pivots. Means is provided whereby the pivot point continuously shifts with the action of said reciprocating means whereby to cause said knife to move in a straight line and not in the form of an arc as would generally be the case when the knife is mounted upon a pivoted lever.

The invention will be more fully understood from a consideration of the following detailed description taken with the accompanying drawings, in which:

Figure 1 is a front elevation of the bean snipper in which my present invention is embodied;

Figure 2 is a fragmentary end view thereof looking from the left side of Figure 1;

Figure 3 is an enlarged fragmentary view showing the improved means for mounting the knife, said view being such as is seen from the end of the machine;

Figure 4 is an enlarged fragmentary side elevation of said mounting means; and

Figure 5 is a diagrammatic view of the supporting arms for the knife showing the principle upon which they work and their respective positions after a movement of the knife.

Referring now to the accompanying drawings, wherein like reference characters are employed to designate similar members throughout the several views, the main supporting frame of the bean snipper comprises a base member 10 and a plurality of leg members 11. At each end of said base member 10, there is a traveler supporting member 12, in each of which members are mounted a plurality of travelers 13 designed to support a rotatable cylinder 14.

The rotatable cylinder 14 is of the same

general type as shown in my prior patent and is provided with a plurality of apertures designated 15, through which the ends of the beans are adapted to project whereby they will be snipped in a manner to be described. Within the cylinder 14 is a continuous baffle on the order of an Archimedean screw (not shown in detail) designed to feed the beans continuously through the cylinder.

The motive power for said bean snipper is furnished to a pulley 16 by means of a belt (not shown), which leads to a suitable source of power (not shown). The pulley 16 is mounted on a shaft 17 journalled in suitable bearings, and supports a worm gear 18, which meshes with a ring gear 19, said ring gear 19 being secured integrally to the cylinder 14.

A spur gear 20, also secured to said shaft 17, meshes with a pinion 21 secured on a shaft 22, which is also suitably journalled in the main frame of the machine. The shaft 22 has secured to the opposite end thereof a gear 23 which meshes with a gear 24 secured on a stub shaft 25.

An eccentric 26 is keyed to the stub shaft 25 and has associated therewith an eccentric strap 27, which is connected with an eccentric arm 28. The eccentric arm 28 drives the knife mechanism which will now be described in detail.

An angle iron 30 (Figure 1) is secured on suitable projections of the main frame of the machine and secured to said angle iron 30 are front and rear pivot support castings 31 and 32 respectively.

Secured on the pivot support castings 31 and 32 are links designated 33—33 and 34—34, said links being secured by means of pivot studs 35—35 and 36—36. Pivot members 37 are secured to the links 33 and 34 by means of pivot studs 38—38 and 39—39. The pivot members 37 are each secured to castings 40 and 41. The front casting to which one of the members 37 is secured is designated by the reference character 40, while the corresponding rear casting is designated by the reference character 41. A tie rod 42 is secured by suitable means between the two castings 40 and 41.

Pivoted to the castings 40 and 41 are knife supporting members 43 and 44 respectively, said knife supporting members having secured thereto an angle iron 45 to which a knife 46 is riveted or otherwise secured. Each of the knife supporting members 43 and 44 is provided with a set screw 47, the end of which engages a portion of the casting 40 or 41 as the case may be, and hence limits the movement of the knife 46 toward the cylinder 14. The set screw 47 is designed so that it can be turned in either direction to regulate the setting of said knife 46.

Reference will now be made to the manner in which I secure a continuous pressure of the knife 46 in the direction of the cylinder. Referring particularly to Figure 4, it will be seen that a rod 50 is rotatably secured in the casting 41, and has secured thereto a dog 51 (Figure 3) which engages a portion of the knife support member 43 or 44.

The rod 50 has secured thereto a coil spring 52, which coil spring 52 is secured to a portion of the casting 41. The coil spring 52 is constantly under tension so that it tends at all times to twist the rod 50 toward the cylinder. This results in a gradual pressure on the pivot member 43 or 44 by the dogs 51. In this manner the knife is always held in close proximity to cylinder 14, but if any hard or uncuttable substance finds its way into the cylinder and projects therethrough so as to engage the knife 46, said knife 46 will readily disengage itself from the cylinder through the actuation of the mechanism shown to prevent serious damage thereto.

The construction of the knife support members is such that when the knife is forced away from the cylinder the support members are freed from engagement with the dogs 51, and hence also from all influence by the springs 52. The knife will therefore be entirely unassociated with the cylinder until an operator has an opportunity to remove the obstruction from the cylinder and reset the knife, with the supports therefor, in engagement with the dogs 51.

Figure 5 shows the manner in which the pivots for the knife function, the portions of the mechanism there shown separated from the main body of the machine bearing the same reference characters as shown in connection with the machine. It will be seen that the top portion of the pivot member 37 travels in a straight line, and since there are two of these members secured to the knife 46, a reciprocation of the knife by means of the eccentric arm 28 will result in a truly horizontal movement of said knife in a single plane.

I claim:

1. In a bean snipper, a knife, a support at each end of said snipper, a plurality of levers on said support and pivoted normally to the cutting edge of said knife and designed so that said knife may be reciprocated in a linear path, means for imparting a reciprocating motion to said knife, and means for moving a plurality of beans into the path of said knife.

2. In a bean snipper, a revolving cylinder having apertures therein through which the ends of beans extend, a frame for said cylinner, a knife substantially coextensive with the length of said cylinder, supports on said cylinder for said knife, a plurality of levers on each support for holding said knife and

maintaining its cutting edge in a truly linear path, the axis of which is normal to cutting edge of said knife, means for imparting a reciprocating motion to said knife through said plurality of levers, means for rotating said cylinder, and means for moving said knife coincidentally with the movement of said cylinder.

3. In a bean snipper, a cylinder, mounting devices for producing a linear motion parallel to the axis of said cylinder, a lever on said mounting devices, means for urging said lever toward said cylinder, and a knife pivotally secured to said devices for arcuate movement toward said cylinder, under the influence of said lever, said knife being adapted to be released from the urge of said lever when said knife engages an obstruction in said cylinder.

4. In a cylindrical bean snipper, a knife, a device associated with said snipper for producing linear motion parallel to the axis of the cylinder thereof, a holder for said knife mounted for arcuate movement in said device and having a seat, a lever pivoted in said linear motion producing device and having means for urging said lever in the direction of said cylinder, said lever normally extending into said seat for urging said holder and knife toward said cylinder, the engagement of said holder upon said lever being such that said holder is unseated when an obstruction in said cylinder engages said knife.

5. In a cylindrical bean snipper, a holder adapted to be reciprocated in a linear path adjacent said cylinder, a knife pivotally supported in said holder for movement away from said cylindrical snipper when an obstruction is encountered, and a spring actuated lever intermediate said holder and knife normally urging said knife towards said cylinder and adapted to be disengaged from said knife coincidentally with said knife engaging an obstruction in said cylinder.

WILLIAM E. URSCHEL.