Jan. 6, 1942. A. WIDUCH 2,269,298

POTATO DIGGING MACHINE

Filed Jan. 8, 1941 2 Sheets-Sheet 1

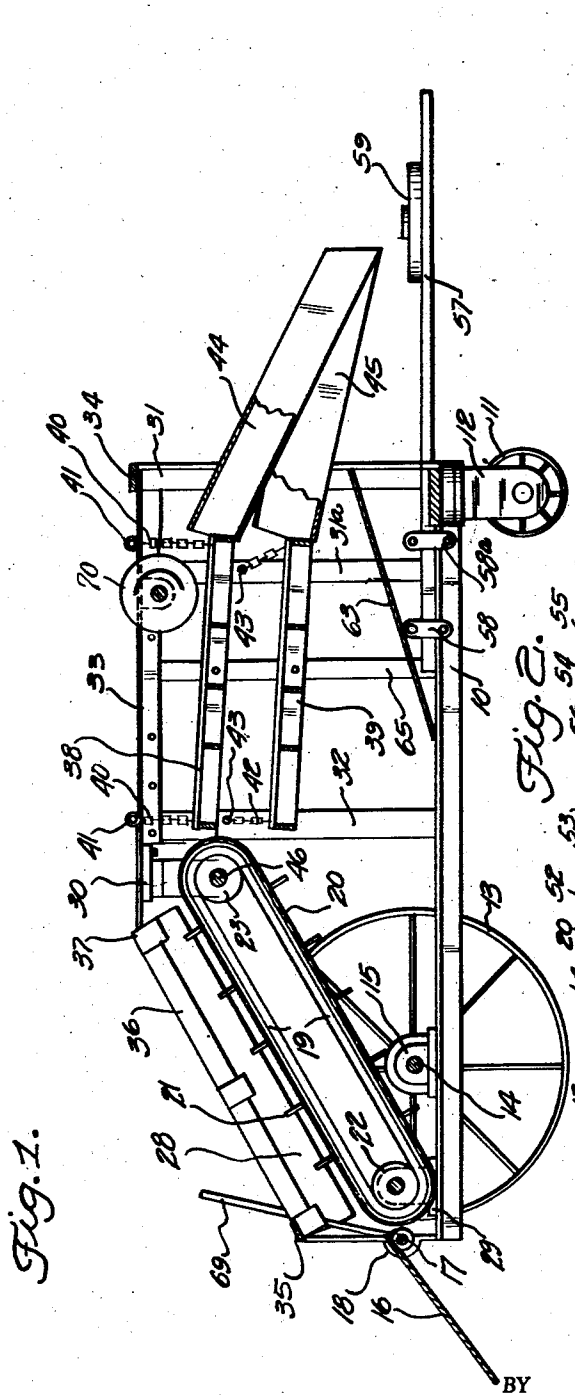


Fig. 1.

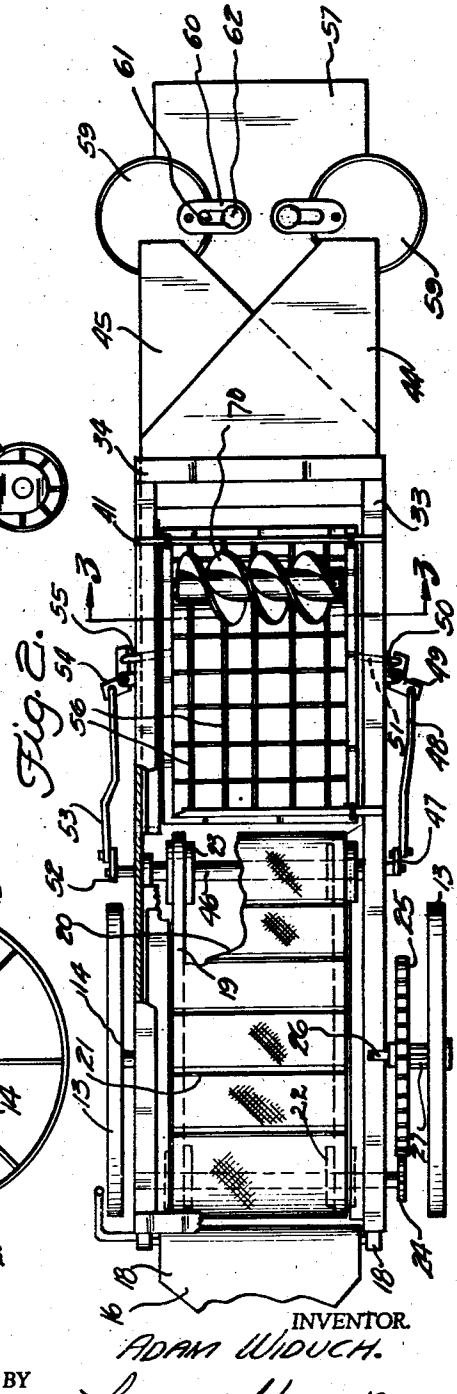


Fig. 2.

INVENTOR.
ADAM WIDUCH.
BY Louis Wayka
ATTY

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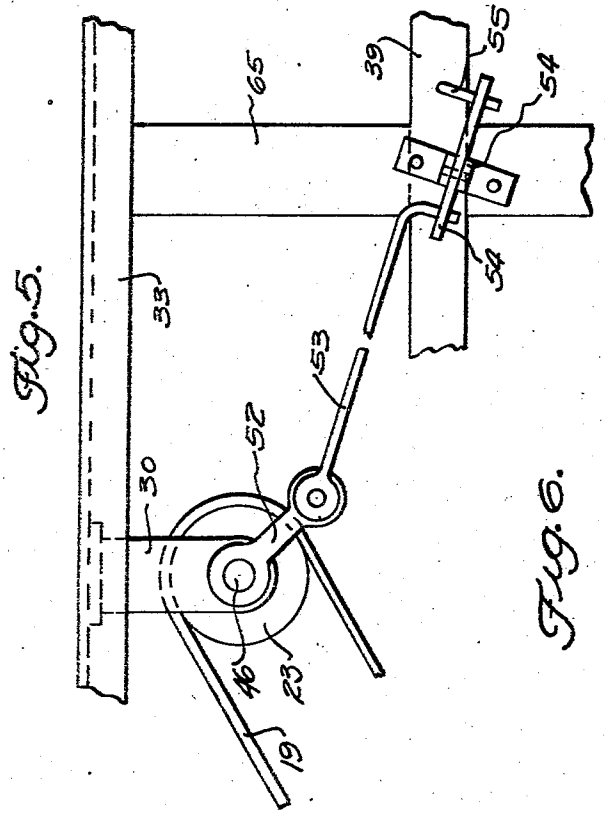


Fig. 5.

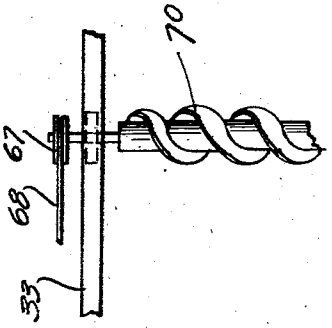


Fig. 6.

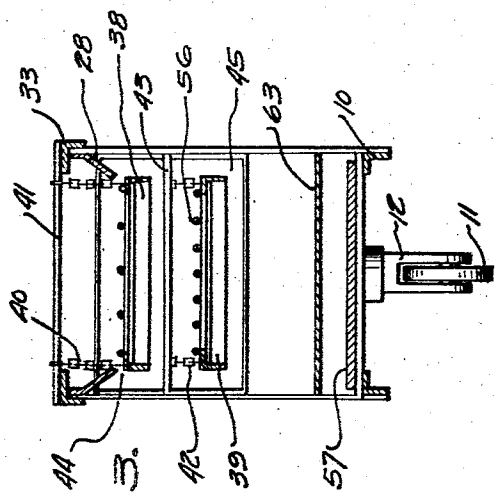


Fig. 3.

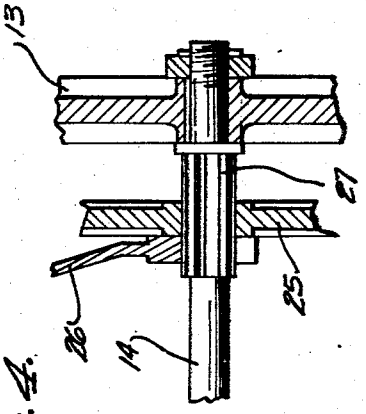


Fig. 4.

INVENTOR.
ADAM WIDUCH.
BY Louis Chayka
ATTY.

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UNITED STATES PATENT OFFICE

2,269,298

POTATO DIGGING MACHINE

Adam Widuch, Michigan City, Ind.

Application January 8, 1941, Serial No. 373,589

1 Claim. (Cl. 55—51)

The purpose of my invention is to provide a machine of simple and light construction and yet practical and efficient. Another purpose is to provide such a machine that not only will dig up potatoes but will also segregate them into grade according to sizes and clean them of dirt and vines.

In carrying out the above purposes, I have introduced some novel features, which with other particulars will be described in the annexed drawings, in which:

Fig. 1 shows a side view of my machine partly in section.

Fig. 2 shows a plan view of my machine.

Fig. 3 shows a sectional view taken on line 3—3 of Fig. 2.

Fig. 4 shows a detail pertaining to slidable gears.

Fig. 5 shows another detail in enlargement, illustrating a device to actuate potato screens.

Fig. 6 shows a screw conveyor which comprises a part of my machine.

Similar numerals refer to similar parts throughout the several views.

In general, my invention consists of a mechanism which plows up potatoes, lifts them with the soil, conveys them by means of a conveyor to the top of the machine where potatoes are thrown upon grading screens and are delivered by means of chutes to containers. Now I shall describe the machine in detail with reference to my said drawings.

The machine rests on a rectangular frame 10 supported at the rear on one wheel 11 from a bracket-like member 12 depending from said frame. At the front the machine is supported by two wheels 13 mounted on a shaft 14 journalled in block 15 mounted on the upper side of frame 10. A metal share 16, affixed to a transverse shaft 17, is pivotally mounted in front of the machine in a bearing 18 and adapted to be controlled, that is, to be raised or lowered by a lever 69. A parallel pair of endless conveyor belts 19 are stretched on two pairs of rollers 22 and 23, one pair of the rollers being seated on a shaft journalled in brackets 29, the other in brackets 30. It will be noted that the belts are quite narrow but that they support a web 20 made of canvas, which extends from one belt to another. Raised strips 21 are located transversely on said canvas and form a part of the belt. These strips may be made of rubber, wood or other suitable material.

In order to provide means to operate the conveyor, a gear wheel 25, seated on shaft 14, is adapted to be meshed with pinion 24 mounted on the same shaft which supports rollers 22. The arrangement is such that gear wheel may be disengaged from pinion 24 and this is done by means of a lever 26 and a spline 27. Since there is nothing new about this particular construction and since any other arrangement may be used for that purpose, I am not describing it in more detail.

Rising on the frame 10 at each rear corner are posts 31. A pair of similar posts 32 are placed in mid-distance between the front and the rear end of the machine, while short posts 35 are placed right at the front end of the machine. Said posts 31 and 32 are connected by planks 33 each of which, towards its front end, meets another member 36 sloping down towards posts 35. Numeral 34 indicates a cross-bar connecting two posts 31. It will be understood that there are two such planks 33, which run parallel to each other. This applies also to members 36. Suspended by short metal strips 37 from each member 36 are deflectors 28. These deflectors are disposed on each side of the conveyor belt and form a trough in which potatoes are raised to the top of the machine. Back of the belt conveyor 19 are two screens 38 and 39, the first being suspended by means of chains 40 from rods 41, the second being suspended by chains 42 from rods 43. The screens are made in the form of rectangular trays and are provided with spaced wires 56 running parallel to each other. The difference between the trays is that the distance between said wires is smaller in the lower tray. A chute 44 serves as the outlet of the upper tray 38, while the lower tray 39 is adapted to empty into chute 45.

I have provided a special mechanism for the purpose of rocking the trays back and forth, and this is accomplished by means of a crank 47 mounted on shaft 46, which is the shaft operating rollers 23. A bar 48 connects said crank 47 with a rocker 49 pivoted in bracket 50 on the side of the machine. The rocker is again attached by a connecting rod 51 with tray 38. A similar arrangement is provided on the other side of the machine for the purpose of rocking the lower tray 39. In this case shaft 46 actuates crank 52, bar 53, rocker 54 and connecting rod 55 which is attached to the lower tray 39. 31a indicates a pair of posts serving to support tray 39, while a pair of members 65 serve to support rockers 49 and 54 respectively. A sloping apron 63 is built into the machine below trays 38 and 39 so that soil dropping from said trays may slide

down upon said apron and fall upon the ground under the machine.

It will be noted on reference to my drawings, that the delivery chutes 44 and 45 are provided with diverging outlets. Since it is preferable that the potatoes be delivered in some containers like sacks or baskets, I have made a provision for their support in my machine. This consists of a board 57, made to slide in or out of my machine. To facilitate this function, rollers have been provided by me, mounted on brackets 58 and 58*a*, as shown in the drawings. The outer end of the board, marked 57, is provided with two basket holders 59. These are shallow metal trays provided with handles 60 containing slots 61 and are retained in place by bolts 62 within said slots. Owing to this construction it will be easy to swing the holders in any direction which may be desired. When not in use, the holders may be so disposed upon the board that they do not interfere when the board is slid into the machine.

Still another provision has been made by me for the purpose of removing vines or weeds which may be brought up by the conveyor belt to the top of the machine and thrown upon the screens. This consists of a screw conveyor shown in Fig. 6. The conveyor shown in a dotted outline and indicated by numeral 70 in Fig. 1, consists of a metal shaft and a spiral plane made of rubber and is mounted beneath planks 33 transversely to the direction of travel of the belt conveyor. It is operated from shaft 46 by means of belt 68 and pulley 67. Here again I am not going into details of connections because these are of elementary nature.

Having described the details of the construction of my machine, I shall now describe its operation:

It will be understood that the machine must be pulled by horses, by a tractor, or by some other means. The share, 16, is low enough to plow into soil below the line of growth of potatoes. While the machine is made to proceed forward, the potatoes and the soil in which they are, are pushed upward upon the conveyor 20. Lever 69 is provided for the purpose of lowering the share to the required depth. The conveyor, as stated before, is made in such a manner that its surface is flexible and yielding, as it is preferably made of canvas. Therefore, when dirt and potatoes are thrown upon said conveyor the canvas may yield under the load forming depressions or pockets. When the potatoes have been conveyed to the top of the machine, they are thrown upon screens 38 and 39. While the screens are rocked back and forth by my rockers 49 and 54, soil is shaken off and falls through screens upon apron 63 and therefrom to the ground under the machine. Potatoes which are large enough to be retained by spaced wires 56 fall by gravity into chute 44. Potatoes which are too small to be retained by said wires 56 fall upon the second screen 39 and by gravity roll down into chute 45. Baskets placed in holders 59 catch the potatoes that fall therein.

The operation of the screw conveyor 70 is obvious. The spiral web of the conveyor does not touch the top screen but allows enough clearance for large potatoes to pass under said conveyor. Larger vines, however, which cannot pass through the screens to the ground would be pushed from the screens to the ground over the side of the machine by the spiral web of the screw conveyor.

Having thus described the construction and the operation of my machine, I claim the following:

In a potato digging machine a frame supported on wheels, a pivoted, lever controlled share in front of the machine, conveyor means back of the share to the top of the machine, said conveyor means comprising two narrow belts, spaced from each other and mounted on rollers and a flexible web stretched between said belts and provided with transverse strips raised above the surface of the web, a plurality of superimposed grading screens suspended on chains back of the conveyor means, where the load of the conveyor means may be dumped thereon, rocker means to laterally actuate said screens, a plurality of delivery chutes, each screen delivering its potatoes to a separate chute, screw conveyor means on top of the machine disposed transversely above the top screen to divert vines, and means responsive to the rotation of the wheels to actuate the conveyor means, the screens and the screw conveyor.

ADAM WIDUCH.