(No Model.) 2 Sheets—Sheet 1.

G. W. SNYDER.

MACHINE FOR GRADING POTATOES OR ONIONS.

No. 570,305. Patented Oct. 27, 1896.

Fig. 1.

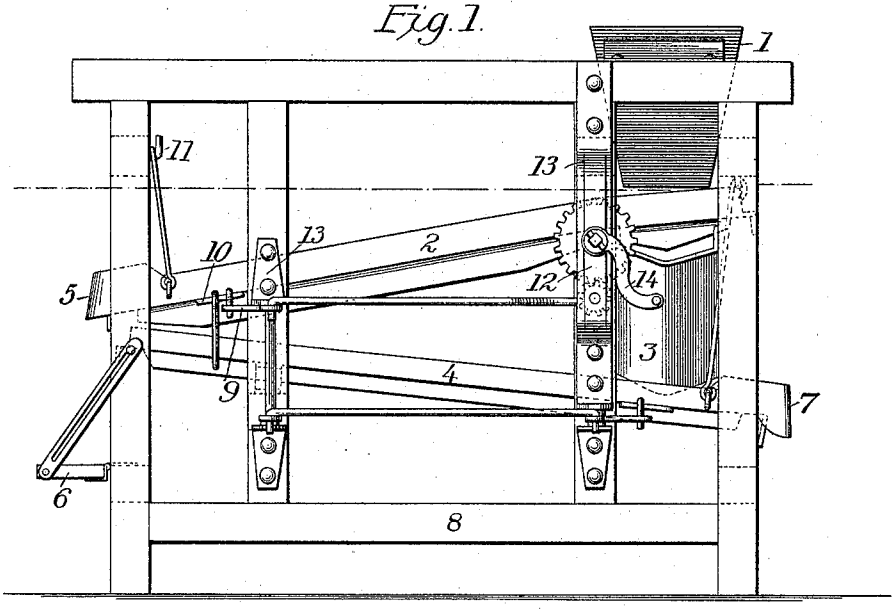


Fig. 2.

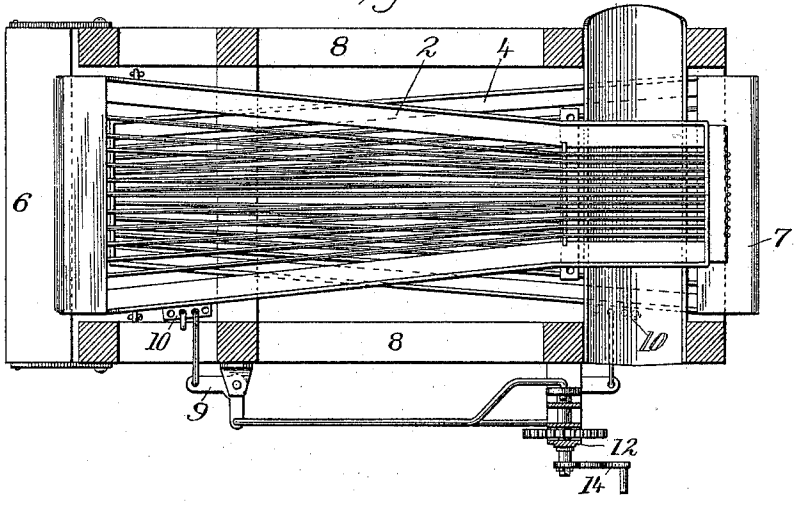
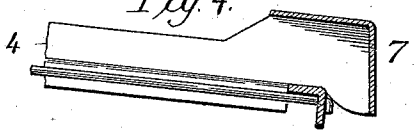


Fig. 4.



Witnesses.
Edgar R. Free
S. S. Coulter

Inventor.
George W. Snyder

(No Model.) 2 Sheets—Sheet 2.

G. W. SNYDER.

MACHINE FOR GRADING POTATOES OR ONIONS.

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Fig. 3.

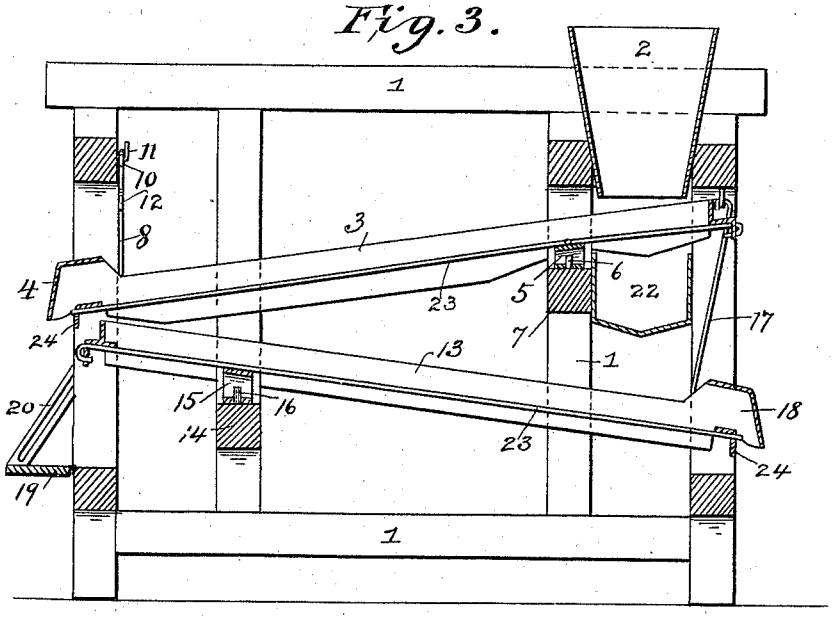


Fig. 5.

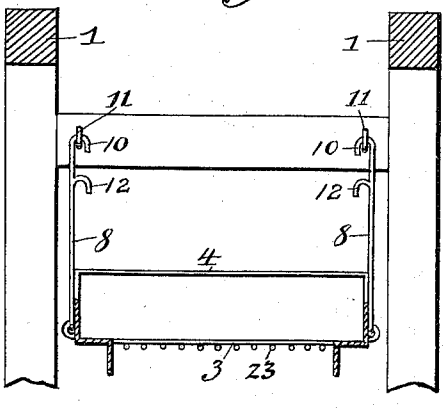


Fig. 6.

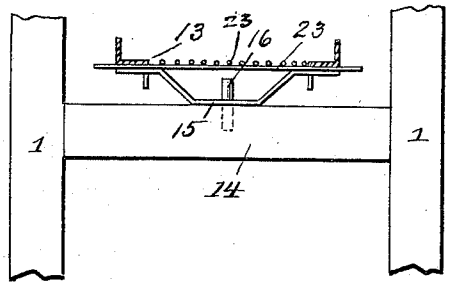
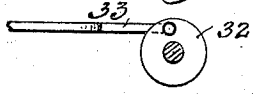


Fig. 7.



Witnesses
Jas. N. Blackwood
Albert B. Blackwood

Inventor
George W. Snyder
by David A. Gowick
Attorney

UNITED STATES PATENT OFFICE.

GEORGE W. SNYDER, OF ORANGEVILLE, OHIO.

MACHINE FOR GRADING POTATOES OR ONIONS.

SPECIFICATION forming part of Letters Patent No. 570,305, dated October 27, 1896.

Application filed April 22, 1895. Serial No. 546,781. (No model.)

To all whom it may concern:

Be it known that I, GEORGE W. SNYDER, a citizen of the United States, residing at Orangeville, in the county of Trumbull and State of Ohio, have invented a new and useful Machine for Grading Potatoes or Onions, of which the following is a specification.

My invention relates to devices for separating and grading potatoes, onions, and other vegetables, and has for its object to provide an improved construction of machine whereby the articles to be graded will by means of a series of inclined vibrating screens be first separated from any commingled dirt or other impurities and then separated or graded according to their size.

A further object of my invention is to provide an improved mechanism for imparting the necessary vibrating motion to the separating-screens.

These objects I accomplish in the manner and by the means hereinafter described and claimed, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation of my improved device. Fig. 2 is horizontal section taken on the line *x x*, Fig. 1. Fig. 3 is a central vertical longitudinal section of the device. Figs. 4, 5, 6, and 7 are enlarged detail views of various parts of the machine.

In the several views similar figures of reference denote corresponding parts.

In the said drawings the reference-numeral 1 denotes the frame of the machine, and 2 a suitable hopper fastened in the top thereof near one end and adapted to receive the articles to be graded.

Located in the frame 1 and running longitudinally of the same is the inclined screen 3. The upper end of this screen is located just below the hopper 2, and that portion of the same beneath said hopper is bent slightly with respect to the rest of the screen, so that the articles falling from said hopper will drop onto a screening-surface in nearly a horizontal plane and will gradually move therefrom to the more inclined portion of the screen. The said screen is provided at its lower end with a transverse hood 4, open at its bottom, but curving over the end of the screen to prevent the articles from jumping over the top thereof. This screen is pivotally supported in the frame at a point intermediate with the upper end and the middle of said screen by means of a downwardly-projecting bracket 5 on the under side thereof, the same being centrally apertured to receive a pin 6, projecting upwardly from the cross-beam 7 of the frame 1. At its lower end the screen is supported by hangers 8, engaging with eyes 9 on the sides of the screen and formed into hooks 10 at their upper ends to engage with and hang from hooks 11 in the frame, as shown. These hangers are also provided with supplemental hooks 12, intermediate their length, which may be engaged with the hooks 11 when it is desired to decrease the inclination of the screen.

Located directly beneath the screen 3, but inclining in the opposite direction, is the screen 13, pivoted upon the cross-beam 14 by means of the bracket 15 and pin 16 in a manner similar to the screen 3. At its lower end the hangers 17, hooked to the frame, as shown, and formed with additional hooks, like the hangers 8, afford the necessary support, while a hood 18, similar to the hood 4, performs a similar function.

At the end of the frame opposite to the hopper 2 is a board 19, hinged to the frame and provided with side supporting-straps 20, slotted longitudinally to engage with pins 21 on the frame. This board is for the purpose of supporting a suitable receptacle for receiving the articles as they pass off the end of the screen 3.

Located beneath the upper end of the screen 3 is a transverse chute 22, inclining to one side, for a purpose hereinafter described.

My improved screen which I use in my improved potato-grader is oblong in its general dimensions and is made of metal in all its parts. An upwardly-turned brim is formed on either side and at one end. A downwardly-projecting flange extends all the way around the frame. The sides of the screen are parallel from about one-fifth to one-fourth of its length. The other part of the screen diverges uniformly. The wires forming the screening-surface extend longitudinally the entire length of the screen, and are placed close together and parallel to each other in the parallel of the screen and diverge thence to the wide end thereof uniformly. Under

the screen, at the point at which the parallel construction of the screen terminates, are placed the brackets for pivotally supporting that end of the screen on a cross beam or bar in the frame. The parallel part of the screen, which is placed next the hopper, is bent downward, whereby it rests in nearly a horizontal plane when mounted in the frame wherein it is supported. When the screen is oscillated laterally at its lower end, the movement thereof at the pivoted point is slight, and increases thence to the upper end thereof, producing a greater lateral movement of the potatoes in the screen, when potatoes are being screened and graded, above than at the pivotal point, and causing the dirt to be rubbed off and shaken through and the potatoes to move slowly along onto the section of the screen provided with the diverging wires.

It will of course be understood that the wires in the screen 3 are farther apart than those in screen 13.

The means for agitating the screens will now be described as follows: Attached to the vertical beam 25 of the frame is a bracket 26, supporting therein a shaft 27, carrying a gear-wheel 28 on its inner end and a crank-handle 29 on its outer end. This crank-handle may, however, be dispensed with and a pulley provided to receive power from a belt driven by a suitable motor. Meshing with the gear-wheel 28 is a smaller gear-wheel 30, mounted on a shaft 31, also supported in the bracket 26, and carrying at its inner end a disk 32, to which is eccentrically connected the rod 33. This rod passes longitudinally along the frame, and is connected at its other end with the bell-crank lever 34, mounted on the upper end of a vertical shaft 35, carried by suitable brackets 36 on the vertical beam 37 of the frame. At its lower end this shaft 35 has mounted thereon the arm 38, connected by means of the rod 39 with the bell-crank lever 40, also supported by the bracket 26. The free ends of the bell-crank levers 34 and 40 are connected by means of the rods 41 and 42 with the plates 43 and 44, attached to the sides of the screens 3 and 13, respectively. These plates are provided with a series of holes for receiving the hooked ends of the rods 41 and 42, whereby provision may be made for the variation in the distance between the screens and the bell-crank levers due to the former being raised or lowered by their hangers 8 and 17.

From the above description the operation of my device will be understood to be as follows: The potatoes, onions, or other vegetables to be graded and sorted are emptied into the hopper 2, through which they descend onto the nearly horizontal portion of the screen 3, a vibrating motion being imparted to the latter and to the screen 13 through the mechanism for the purpose hereinbefore described. Before the articles can pass onto the more acutely-inclined portion of the screen 3 any dirt or other foreign substance with which they may be mixed will pass through the screen and onto the chute 22, from whence it will be discharged into a suitable receptacle at one side of the frame. The articles will now pass slowly down the bars of the screen 3, the smaller ones dropping through the latter onto the screen 13, while the larger ones will pass off at the end of the screen and into a suitable receptacle placed on the board 19. The articles dropping onto screen 13 will be again subdivided, the smaller ones dropping through and into a suitable receptacle beneath the screen, while the larger ones will be carried down the screen and will pass off the end thereof into another receptacle. It will thus be seen that the articles will be divided into three different grades, according to size.

By gradually widening the screens from their upper to their lower ends a constant screening will take place, due to the gradual increase in the distance between the wires of the screens.

Having thus described my invention, what I claim is—

1. The combination, in a screen for vegetable-graders, of a screening-surface formed with wires of the same diameter throughout its length placed parallel to each other in a section formed at one end, thence to its opposite end, said wires and the sides of said screen diverging uniformly from each other, said screen provided with an upwardly-extended brim at each of its sides and the narrow end thereof, a downwardly-extended flange on each side and the broad end thereof, the wide end of said screen having rigidly secured to each side thereof a hood extending across the top of said screen and turned down over the end thereof at a distance therefrom, said screen provided with a bracket on its under side at the point of divergence of said wires therein for pivotally supporting one end of said screen, means for attaching hangers to the broad end of said screen and means for connecting said end with oscillating mechanism, substantially as shown and described.

2. A vegetable-grader consisting of a supporting-frame and hopper and having a series of reversely-inclined screens one above another therein each of said screens having a section of its upper end formed of wires placed close together and parallel, from said section to the lower end of said screen, the wires therein diverging uniformly, said screens pivotally supported at the junction of the two sections therein and supported by hangers at the lower ends and having means connected therewith for oscillating said screens whereby a lateral rubbing and retarded movement is imparted to the vegetables in the upper ends of said screens to remove the dirt therefrom before said vegetables enter the diverging portion of said screens, substantially as shown and described.

3. In a vegetable-grader, the combination

of a series of reversely-inclined screens, one above another, supported at their lower ends by hangers and resting on pivotal supports at an intermediate point from the middle of the screen and the upper end thereof, the screen from the upper end thereof to the point where pivotally supported having the wires of the surface thereof placed parallel to each other, thence to the lower end of said screen diverging uniformly and means for oscillating the lower ends of said screens laterally, substantially as shown and described.

4. In a vegetable-grader having a supporting-frame having a series of screens therein reversely inclined one above another, each of said screens resting on pivotal supports at a point intermediate of the upper end and the middle of said screen, the lower ends of said screen supported by hangers, the screens between the upper end and the point of pivotal support having the wires therein parallel to each other, thence to the lower end diverging from each other uniformly and the upper end of the top screen slightly bent downward to the point of pivotal support in a plane nearly horizontal, in combination with a hopper located over the upper end of the top screen of the series, a transverse inclined chute located thereunder and means for oscillating the lower ends of said screens laterally, substantially as shown and described.

5. In a vegetable-grader, the combination in a frame provided with a hopper, of a screen having a screening-surface formed of wires of the same diameter throughout their length extending longitudinally therein, a section of the screen at one of its ends having the wires therein placed parallel to each other, thence to the opposite end of the screen the wires therein diverging uniformly, each side and the narrow end of said screen provided with an upwardly-turned brim, its wide end formed with a hood covering the screen near its end and turned down over the end at a distance therefrom, one end of said screen pivotally supported by a bracket formed on the bottom thereof at a point between the end and the middle of said screen, its opposite end supported by hangers and provided with means for oscillating said end laterally, substantially as shown and described.

6. In a vegetable-grader, the combination with a supporting-frame, a series of reversely-inclined screens, each of said screens diverging laterally from a point intermediate of the middle and upper end thereof, one beneath another, transverse downwardly-projecting brackets on the under side of said screens at the point where the screens begin to diverge supporting said screens over cross-beams carrying pins adapted to pass through apertures in said brackets to pivotally support the upper ends of said screens, hangers for supporting the lower ends of the screens and means for oscillating the lower end thereof laterally, substantially as shown and described.

7. In a vegetable-grader, the combination with a supporting-frame and a series of screens reversely inclined one above another and resting on pivotal supports on cross-beams in said frame by pins in transverse brackets at a point intermediate of the middle and the upper ends of said screens, the lower ends of said screens adjustably supported by hangers, wires forming the screening-surface of said screens diverging from each other from the point where pivotally supported to the lower end thereof, of means for imparting a laterally-oscillating motion to the lower ends of said screens consisting of a gear-wheel, means for revolving the same, a smaller gear-wheel meshed therewith, a shaft carrying said smaller gear-wheel, a disk mounted on the other end of said shaft, a rod eccentrically connected to said disk, a bell-crank lever to which said rod is connected at its other end, a rod connecting the other arm of said lever with one of the screens at the lower end thereof, a shaft on which said lever is mounted, an arm carried by said shaft, a second bell-crank lever, a rod connecting said shaft-arm and lever, and a rod connecting said lever with the other of the screens at its lower end, substantially as shown and described.

8. A vegetable-grader consisting of the frame 1, the hopper 2, the reversely-inclined screens 3 and 13, said screens being supported by pivots at a point intermediate the upper end of the screen and the middle thereof and by hangers at the lower ends thereof, said screens having at their lower ends open-bottomed hoods, the transverse chute 22, and means for imparting a laterally-oscillating motion to the lower ends of said screens, substantially as shown and described.

GEORGE W. SNYDER.

Witnesses:
J. H. ELLIOTT,
T. W. MORGAN.