C. F. SHUMAKER.

PEA SEPARATING MACHINE.

APPLICATION FILED JAN. 2, 1908.

906,168. Patented Dec. 8, 1908.

3 SHEETS—SHEET 1.

Fig. 1.

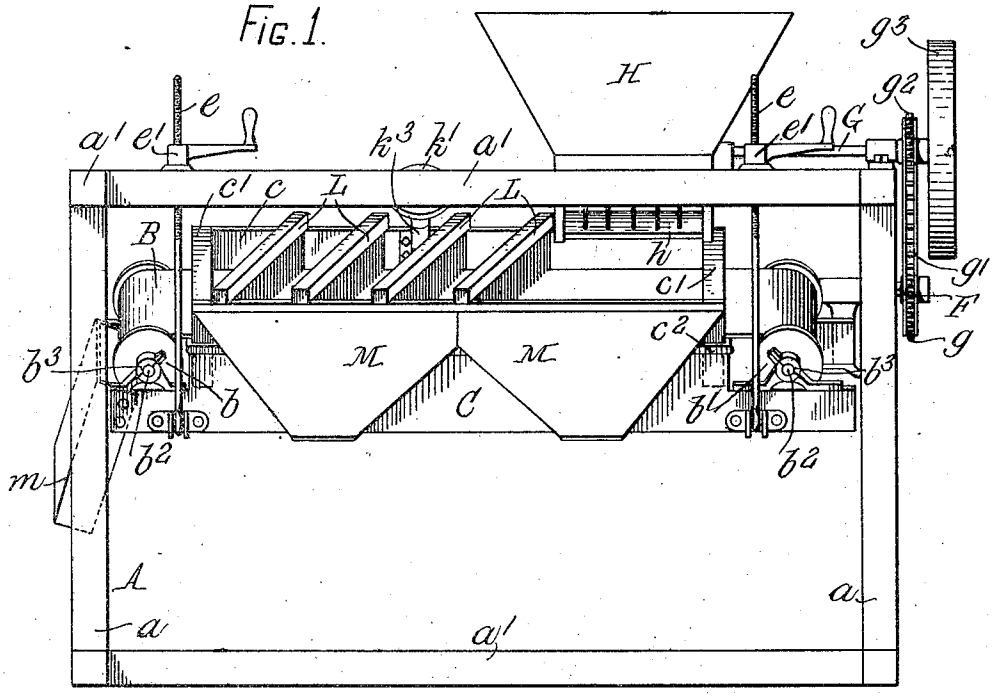
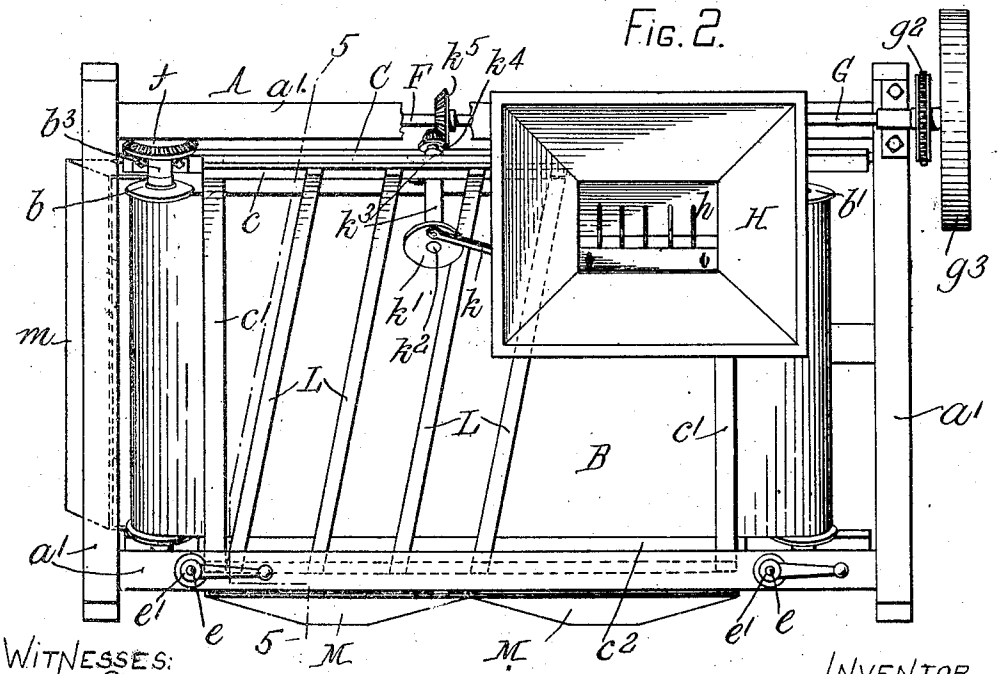


Fig. 2.



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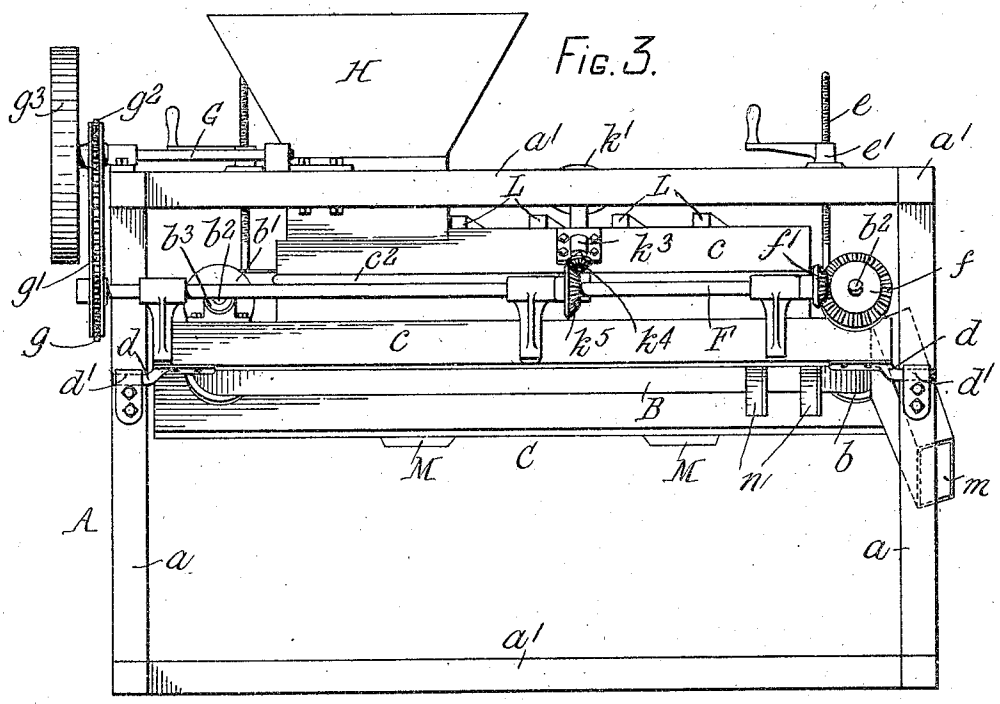
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3 SHEETS—SHEET 2.

Fig. 3.



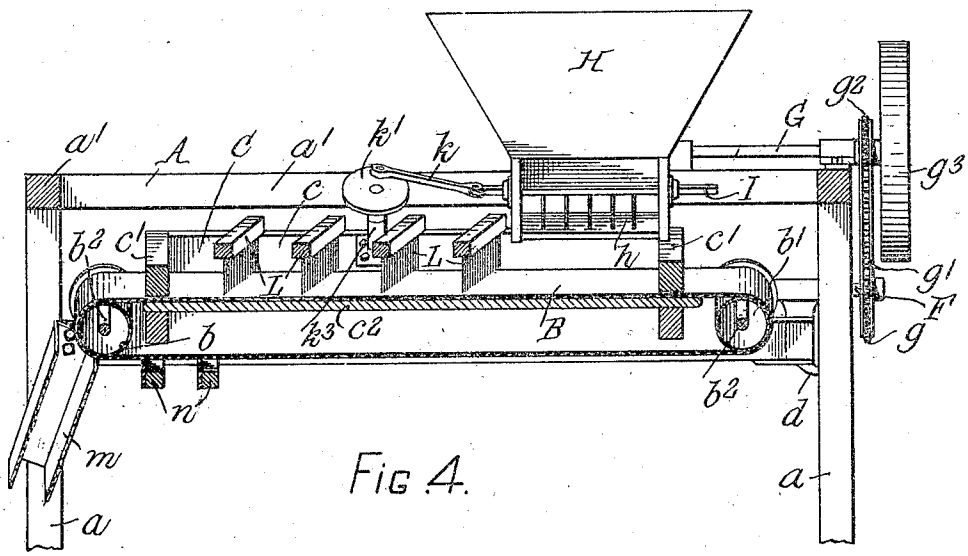


Fig. 4.

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3 SHEETS—SHEET 3.

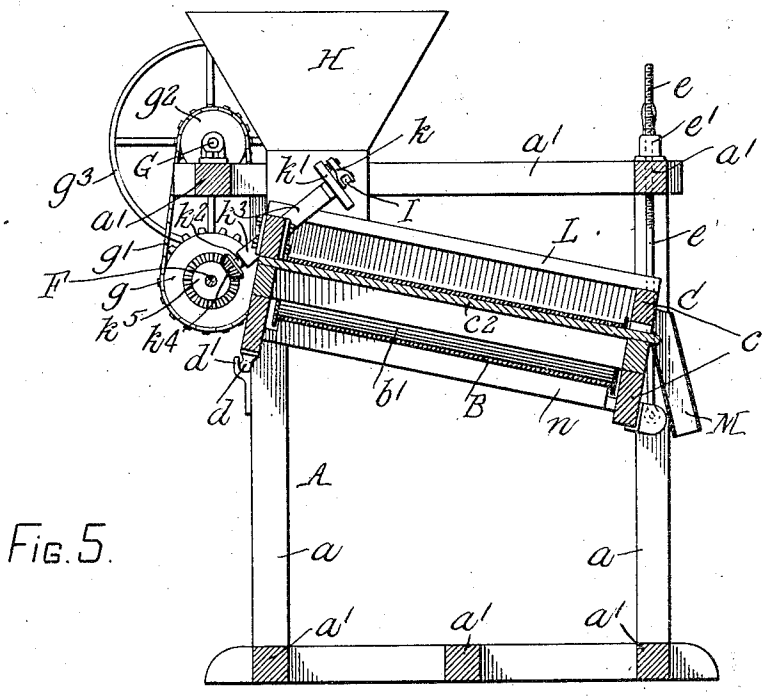
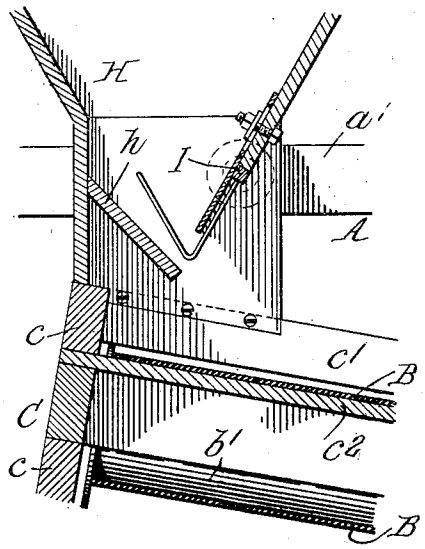


FIG. 5.

FIG. 6.



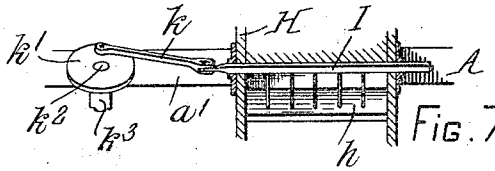


FIG. 7.

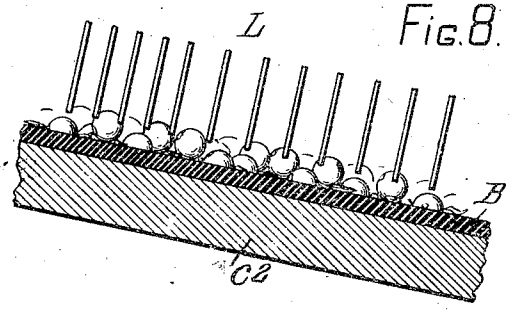


FIG. 8.

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UNITED STATES PATENT OFFICE.

CHARLES F. SHUMAKER, OF SILVER CREEK, NEW YORK, ASSIGNOR TO INVINCIBLE GRAIN CLEANER COMPANY, OF SILVER CREEK, NEW YORK.

PEA-SEPARATING MACHINE.

No. 906,168. Specification of Letters Patent. Patented Dec. 8, 1908.

Application filed January 2, 1908. Serial No. 408,874.

To all whom it may concern:

Be it known that I, CHARLES F. SHUMAKER, a citizen of the United States, residing at Silver Creek, in the county of Chautauqua and State of New York, have invented a new and useful Improvement in Pea-Separating Machines, of which the following is a specification.

This invention relates more particularly to machines of that type used for separating whole peas from broken peas and particles of hulls, leaves or other foreign matter mixed therewith, in which the mixed material is fed upon a traveling belt or separating surface which is inclined transversely as regards its direction of movement, whereby the whole peas roll down the inclined surface and are discharged over the lower side edge of the same while the broken peas and particles of foreign matter which do not readily roll are carried along by the belt and discharged therefrom at one end of the machine as the belt passes around one of its supporting rollers.

While the machine is more especially designed for separating hulled green peas for canning purposes, it is not necessarily restricted to such use, but can be employed for separating round or smooth grains, seeds or other particles which will readily roll or slide down an inclined surface from flat and irregular-shaped and rough particles which will not readily roll or slide down the inclined surface.

The object of the invention is to improve machines of this type so as to increase their efficiency and render them readily adaptable for operation upon materials differing more or less in characteristics, and to this end, combs or rakes are arranged over the separating surface with the lower ends of their depending fingers or teeth separated from the surface such a distance that they will allow broken peas and thin or flat particles to pass freely beneath them with the traveling surface, while they will strike the whole peas and impede their progress with the belt more or less so that the whole peas will be stirred or separated from the broken peas and particles of foreign matter and caused to roll down the inclined separating surface.

The fingers or teeth are slender and spaced from each other and separated from the surface of the belt so as not to obstruct too much the travel of the material with the belt, but only to agitate or shift the whole peas more or less on the belt and thereby free them from the broken peas or foreign particles and start them rolling down the inclined surface. The separating belt is also supported so that its inclination can be quickly and easily changed at any time as may be required by reason of the condition or characteristics of the material being operated upon to secure a perfect separation, and the construction of the machine is otherwise improved in the respects hereinafter described and set forth in the claims.

In the accompanying drawings, consisting of three sheets: Figure 1 is a front elevation of a separating machine embodying the invention. Fig. 2 is a plan view thereof. Fig. 3 is a rear elevation thereof. Fig. 4 is a longitudinal sectional elevation thereof. Fig. 5 is a transverse sectional elevation thereof, in line 5—5, Fig. 2. Fig. 6 is a sectional elevation, on an enlarged scale, of a portion of the feed hopper and associated parts of the machine. Fig. 7 is a fragmentary front elevation, partly in section, of the agitating device and feed hopper. Fig. 8 is a fragmentary sectional elevation, on an enlarged scale, of the separating belt and one of the combs or rakes.

Like letters of reference refer to like parts in the several figures.

A represents the main frame of the machine, which may be of any suitable construction, the frame shown being of rectangular skeleton form composed of upright corner posts a connected by upper and lower side and end bars a'.

B represents the separating belt or apron. An endless belt composed of rubber fabric is preferably employed and passes around two inclined supporting rollers b b' located near the opposite ends of the machine. The shafts b^2 of the belt rollers are journaled at opposite ends in suitable bearings b^3 on a frame C which is pivotally and adjustably supported in the stationary main frame so that its front edge can be raised or lowered to vary the inclination of the separating belt or apron as may be required, depending upon the nature of the material being operated upon.

In the machine shown, the pivoted frame consists of front and rear horizontal bars c connected by end bars c' and an inclined board or table c^2 which is located beneath

and supports the upper run of the separating belt to prevent the same from sagging between the belt rollers. The end bars are slotted or composed of two strips with an intervening space for the passage of the upper run of the belt, and the front bar is similarly constructed to provide an opening for the escape of the peas which roll down the inclined surface of the belt. The frame bars or strips extending above the upper run of the belt form a sort of box around the separating surface to prevent the scattering of the material. The rear bar of the pivoted frame is provided at opposite ends with pivots or trunnions d which rest in bearings d' on the rear posts of the main frame, and the front side of the pivoted frame is suspended by links e from the upper front bar a' of the main frame. The upper ends of these links are screw-threaded and extend up through openings in the bar a' of the main frame and through adjusting nuts e' which bear upon the bar a' and are provided with handles whereby they can be turned on the links to raise or lower the front edge of the pivoted frame. The adjusting nuts e' are conveniently located and can be readily operated at any time to properly regulate the inclination of the separating surface.

The shaft of one of the belt rollers extends rearwardly beyond its bearing and is provided with a beveled gear wheel f, Figs. 2 and 3, which meshes with a beveled pinion f' on a shaft F. This shaft is journaled in suitable bearings on the rear bar of the pivoted frame, and is provided at one end with a sprocket wheel g connected by a sprocket chain g' to a sprocket wheel g^2 on a drive shaft G which is journaled parallel with the shaft F in suitable bearings on the main frame and is provided with a belt pulley g^3 or other means for driving it. This arrangement of the drive mechanism for the separating belt enables the pivoted frame to be adjusted to regulate the inclination of the belt without interfering in any wise with the driving mechanism, and the belt can be adjusted without stopping the operation of the machine.

H represents a feed hopper of any suitable form supported by the pivoted frame and having a discharge throat arranged to feed the peas or other material upon the upper portion of the separating belt near one end thereof. The throat of the hopper preferably has a bottom board h, Fig. 6, which is inclined downwardly and forwardly with regard to the machine, and a front discharge opening so as to discharge the material in a stream or sheet directed forwardly, or in the direction of the downward inclination of the separating surface, so as to thereby spread the material evenly and impart to it a tendency to roll or slide down the inclined separating surface. The material is agitated in the throat of the hopper to prevent it from clogging, by suitable means. For this purpose an agitating bar I is arranged to slide lengthwise at the front side of the throat in suitable bearings on the ends of the throat, and is provided with depending fingers or rods having upturned ends which extend up through the discharge opening into the throat. The agitator bar is reciprocated by a link k connected to a crank wheel k' secured to a shaft k^2 which is journaled in a suitable bearing k^3 on the rear bar of the pivoted frame and is provided with a beveled pinion k^4 meshing with a beveled pinion k^5 secured to the shaft F.

L represents the combs or rakes, which are arranged transversely, or fore and aft of the machine, over the upper run of the separating belt and have depending slender fingers, tines or teeth. The combs or rakes are conveniently secured at their ends on top of the front and rear bars of the pivoted frame, and their fingers or teeth are preferably made of relatively slender wires. The lower ends of the fingers or teeth are preferably separated from the separating surface of the belt a distance less than the diameter of the whole peas or seeds to be operated upon, but greater than the height of the broken peas, seeds or particles to be separated from the whole peas or seeds, so that the teeth allow the broken peas or seeds and thin or flat particles to travel freely beneath them with the belt while more or less preventing the whole peas or seeds from being carried past them by the belt. The fingers or teeth are also preferably arranged closer together over the rear or upper portion of the separating surface than over the remaining portion thereof, so that the whole peas on such upper portion of the separating surface cannot pass through the combs or rakes but will be stirred or agitated and caused to move down the inclined surface, or be spread out more uniformly over the width of the belt. The fingers or teeth over the greater portion of the width of the belt are not placed so close together as to prevent the whole peas or seeds from passing between them, but the whole peas will not pass the fingers or teeth without striking them and the teeth will shift the peas so as to start them rolling down the inclined surface should they become entrapped by broken peas or foreign particles, or for other reasons be prevented from rolling. The fingers or teeth are resilient enough to be set vibrating slightly by the contact of the material therewith, and this vibration assists in the agitating or stirring action of the fingers or teeth. The combs or rakes are preferably arranged obliquely, as shown, as the whole peas, due to the motion of the belt, roll across the same in oblique paths and the combs are less apt to obstruct the descent of the peas. It will be observed that the fingers or teeth of the combs do not drag on the separating surface

and the broken peas and thin or flat particles can pass freely beneath them and do not have to force their way past the combs, the combs simply acting to move or stir the peas or material sufficiently to enable the rolling of the whole peas down the inclined surface.

Suitable discharge chutes or spouts M and *m* are supported by the pivoted frame at the front side and one end thereof to receive respectively the whole peas and tailings or foreign matter and direct the same into suitable receptacles.

n n represent flexible scrapers supported by the pivoted frame beneath the lower run of the belt and bearing against the surface thereof for removing particles which may adhere to the belt and fall into the tailing chute.

I claim as my invention:

1. The combination of a traveling separating surface which is inclined transversely to its direction of movement and upon which the material to be separated is fed, and one or more combs arranged over said separating surface and having slender spaced teeth which depend toward said surface but terminate far enough above the same to allow the flatter or thinner particles of material traveling with the separating surface to pass freely beneath the teeth without deflecting them, substantially as set forth.

2. The combination of a traveling endless apron which is inclined transversely to its direction of movement and upon which the material to be separated is fed, and one or more combs arranged over said separating surface and having slender teeth which are spaced apart relatively great distances and which depend toward said surface but terminate far enough above the same to allow the flatter or thinner particles of material traveling with the separating surface to pass freely beneath the teeth, substantially as set forth.

3. The combination of a traveling separating surface which is inclined transversely to its direction of movement, means for feeding the material upon the separating surface, and one or more combs arranged over said separating surface and having slender spaced teeth which depend toward said surface but terminate far enough above the same to allow the flatter or thinner particles of material traveling with the separating surface to pass freely beneath the teeth, the teeth over the upper portion of said separating surface being arranged closer together than the remaining teeth, substantially as set forth.

Witness my hand, this 26th day of December, 1907.

CHARLES F. SHUMAKER.

Witnesses:
CARL W. GRASHO,
ELGIN KEITH.