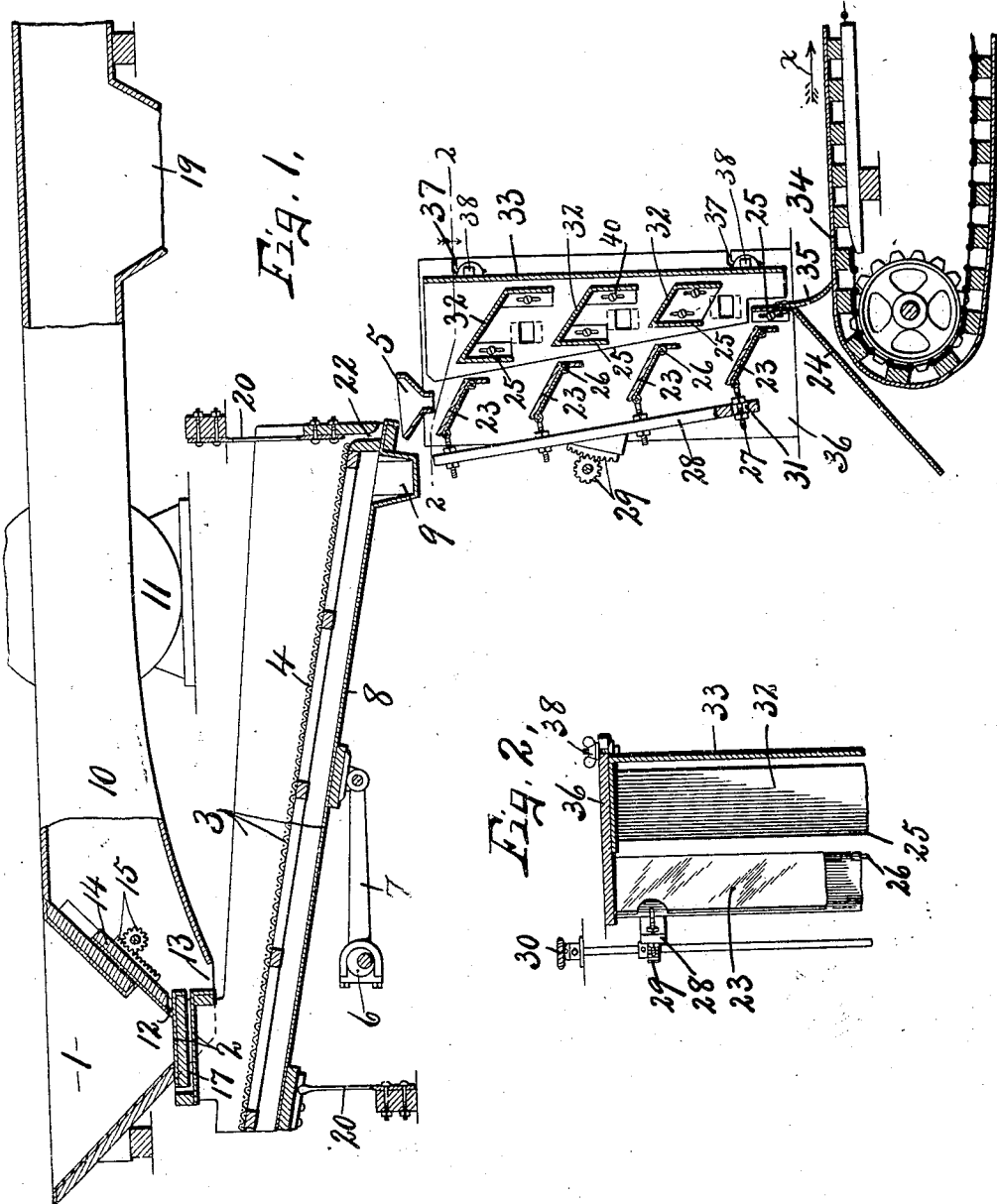


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I. S. MERRELL.
PEA SEPARATING MACHINE.
APPLICATION FILED AUG. 10, 1905.



WITNESSES:

B. E. Robinson.
J. E. Arthur.

INVENTOR:
Irving S. Merrell
BY:
Howard P. Driscoll
ATTORNEY

UNITED STATES PATENT OFFICE.

IRVING S. MERRELL, OF SYRACUSE, NEW YORK, ASSIGNOR TO MERRELL-SOULE COMPANY, OF SYRACUSE, NEW YORK, A CORPORATION OF NEW YORK.

PEA-SEPARATING MACHINE.

No. 856,356.

Specification of Letters Patent.

Patented June 11, 1907.

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To all whom it may concern:

Be it known that I, IRVING S. MERRELL, of Syracuse, in the county of Onondaga, in the State of New York, have invented new and useful Improvements in Pea-Separating Machines, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention relates to certain improvements in the art of separating peas, and refers more particularly to certain individual and associated mechanisms, whereby the perfect peas are graded and separated from the crushed or imperfect peas and refuse as delivered from the pea-shelling machine.

It is well known that during the operation of shelling the peas, either by machinery or otherwise, more or less of the peas are crushed and, together with their refuse, such as parts of the pods and more or less dirt, are unavoidably mixed with the perfect peas, and the essential object of my invention is to provide a simple and efficient means for expeditiously and economically separating the perfect peas from the refuse and imperfect ones, preparatory to canning.

Other objects and uses of certain parts of the apparatus will be brought out in the following description.

The invention, briefly stated, consists essentially in dropping the mixed peas and refuse from a suitable height upon one or more inclined surfaces, whereby the perfect peas are caused to bound from said surface by reason of their elasticity, while the crushed or imperfect peas and refuse simply slide or roll down the incline and are deposited in one locality, while the perfect peas bound from said inclined surface beyond the places of deposit of the imperfect peas and refuse, and are thus separated from the refuse by reason of their inherent elasticity.

In the drawings, Figure 1 is a vertical sectional view of my invention, and Fig. 2 is a detail sectional view taken on line 2-2, Fig. 1.

In order to obtain the best results, the peas and refuse are placed in a suitable hopper —1— having a reciprocating bottom —2— forming a part of an agitating frame —3—, in which is located an inclined screen —4— extending from a point under the hopper to a second hopper —5—. The agitator frame —3— is reciprocated back and forth by

means of an eccentric —6— and connecting rod —7— and is provided with an inclined bottom or chute —8— extending under the screen —4— and terminating at its low end in a transversely inclined trough or chute —9— so that the finer peas, half peas and refuse, which may have sifted through the screen —4—, will gradually gravitate along the inclined bottom —8— into the trough —9—, from which it may be collected.

One side of the hopper —1— is connected to and communicates with a suction-pipe or conduit —10— from which the air is drawn and forced, under pressure, by a suitable blower —11— for maintaining a forced draft from the hopper —1— through the conduit —10— for the purpose or removing, by suction, portions of the pods, hulls, and other light refuse which may find its way into the base of the hopper or adjacent end of the conduit —10— which communicates with the base of the hopper —1— through a constricted passage —12— directly above the movable bottom 2— and extending some distance transversely of and above the adjacent end of the screen —4—, the vertical depth of said opening 12— being just sufficient to allow the larger peas to pass easily there-through and into the adjacent end of the suction-pipe —10— where they fall into an opening —13— in the bottom of the pipe —10— onto the upper end of the screen —4—. The vertical depth of this opening —12— may be varied by means of a movable gate or section —14— of the hopper —1—, such adjustment being effected through the medium of a rack and pinion —15—, or equivalent device.

The vibratory or reciprocal action of the bottom —2— tends to feed the peas forwardly through the passage —12—, thereby spreading them out in a thin layer across the inner edge of the bottom, where they enter the suction-pipe —10— to facilitate the removal, by suction, of much of the lighter refuse. The separation of the dust and light refuse from the peas is further augmented by providing the bottom —2— with an air passage —17—, which has one end communicating with atmosphere and its other end opening into the adjacent end of the pipe —10—, below the pea-passage —12—, so as to produce a comparatively strong current of air passing through the falling peas as they

drop from the opening —12— through the passage —13— and onto the screen —4—, thereby removing, by suction, the greater part of the pod fragments and lighter refuse and forcing it through the conduit —10—, where they may be discharged at any place remote from the separating apparatus, as for instance, through the discharge-opening —19— in the bottom of the conduit —10—, the suction being just sufficient to remove the dust and light refuse which are lighter than the peas, such suction being insufficient to draw the perfect peas and heavier refuse into the conduit 10.

The agitator-frame —3— constitutes a chute or inclined conduit mounted upon suitable spring-arms —20— and actuated back and forth through the medium of the eccentric —6— and connecting-rod —7—, thereby causing a similar operation of the screen —4— which is mounted within the frame —3— and along which the perfect peas, together with the crushed peas and other refuse, not removed by the air draft in the pipe —10— or screer —4— gradually gravitate and pass through the discharge opening —22— in the low end of the agitator-frame —3— where the perfect peas, together with the crushed peas, and other coarse refuse fall into the hopper —5— to be subjected to further steps of still greater importance in the separating process.

The part of the apparatus just described is particularly useful in separating a large part of the dust or grit, small undeveloped peas and light fragments of the pod which may be mixed with the perfect peas as delivered from the shelling machines, but it does not serve the same important purpose of separating the crushed or imperfect peas, balls of dirt and mud, and larger fragments of the pods which find their way into the hopper —5—, and in order that these objectionable elements may be expeditiously and economically separated from the perfect peas, I provide one or more, in this instance, a series of inclined beds, steps or surfaces —23— arranged one above the other some distance below the discharge end of the hopper —5— with their low edges in different vertical planes so that the lower side of the lower inclined beds or surfaces project beyond the vertical plane of the one above it, whereby the imperfect peas or refuse sliding from the upper beds or surfaces fall upon the next one below it and are finally discharged or deposited at the bottom or below the lower bed upon an inclined chute or way —24—, Fig. 1, while the perfect peas, which are round, hard and elastic, bound from said inclined surface or surfaces over and beyond the upper edge of the companion partition —25—, there being one of these partitions located at and a slight distance from the lower side of each of the inclined beds or surfaces 23.

The upper inclined bed or surface —23— is located a sufficient distance below the discharge end of the hopper —5— to cause the falling peas, which are perfect, to rebound over the upper edge of its partition —25— and the other underlying inclined beds or surfaces —23— are also spaced apart a sufficient distance to cause the perfect peas to rebound over their respective partitions —25— in case they should fail to be separated when striking the first or upper inclined bed, the upper edges of each of said partitions —25— extending some distance above the horizontal plane of the lower edge of its inclined surface to prevent the imperfect peas or refuse from sliding over the upper ends of the partitions with the perfect peas.

Each of the inclined beds or surfaces —23— may be adjusted separately or simultaneously to vary the tilting angle or degree of inclination, and for this purpose each bed is hinged at its low end at —26— and its higher edge is hinged to a vertically adjustable eye or bolt —27—, which in turn, is adjustably mounted in a vertically adjustable bar —28— forming a common support for the higher edges of all the inclined beds or surfaces —23—. This bar —28— is adjustable vertically through the medium of a rack and pinion —29—, the pinion-shaft having a hand-piece —30—, as shown in Fig. 2, whereby such adjustment may be effected at the will of the operator. The separate adjustment of each of the inclined beds or surfaces —23— is effected by passing the bolt —27— through an elongated slot —31— in the bar —28— to which said bolt is clamped by suitable lock nuts, best seen in Fig. 1. The object of making these inclined beds or surfaces —23— adjustable or tiltable at different angles, is to vary the angle of rebound of the perfect peas, and also to establish a proper incline for the speedy gravitation of the imperfect peas and refuse therefrom so that they will strike against and fall within the partitions —25—, while the perfect peas bound over the tops of said partitions and are deposited in a different place, presently described.

The upper edges of all of the partitions —25—, except the lower one, are shown as united to inclined surfaces —32—, which serve to receive the perfect peas which bound from the inclined beds —23— and conduct them to substantially the same vertical plane within a suitable inclosure or vertical wall —33—. This vertical wall —33— forms one side of a vertical passage through which the perfect peas finally pass and are deposited upon an endless conveyer —34—, the falling peas being deflected onto said belt by means of a suitable deflecting plate —35— below the lower partition —25—, said belt being driven by any suitable driving mech-

anism in the direction indicated by arrow —X—, Fig. 1.

Some of the peas, although practically perfect, are less elastic, and therefore, do not rebound as high, nor as far as others, and in order that these may be collected separately, according to their degree of elasticity, or, at least, separate from the refuse, the partitions —25— are made adjustable, separately, or together to different heights with relation to their respective inclined beds —23—. For this purpose each partition is adjustably secured by separate fastening means, as bolts —40—, to a vertically adjustable frame —33—, which, in turn, is mounted on one or more fixed upright supports —36— having open sided slots —37— for receiving clamping bolts —38— by which the frame —33— is held in place, the partitions —25— being also provided with vertically slotted flanges for receiving the clamping bolts —40—.

The operation of my improved pea-separating apparatus, briefly described, is as follows: The mixed peas and refuse are dumped into the hopper —1— and fall upon the reciprocating bottom —2—, whereby the peas are spread out more or less along the bottom —2— and are worked or agitated through the passage —12— until they fall from the inner edge of the bed —2— through the opening —13— and onto the screen —4—, which inclines downwardly therefrom toward the hopper —5—. During the agitation of the peas in the hopper —1— and through the passages 12— and 13— the lighter dust and fragments of the pods are drawn by suction through the conduit —10— and forced through said conduit to some remote place from the separating apparatus while the perfect and crushed peas which are too heavy to be drawn into the suction pipe 10, together with the heavier fragments of the pod and balls of mud which cannot be taken up by the air draft fall upon and gravitate along the screen —4—, through which the finer peas, and much of the dirt or grit sifts onto the bed or bottom —8—, and by reason of the agitation of the frame —3— of which the inclined bottom —8— is a part, these siftings are caused to gravitate into the laterally extending chute —11—, which is also inclined downwardly and laterally and serves to discharge the siftings at one side of the machine where they may be collected in a suitable receptacle, not shown. The perfect peas and larger fragments of the pods, as well as other refuse too large to pass through the screen gravitate along the screen —4— through the opening —22— and into the

hopper —5—, from which the mixed peas and refuse fall upon the upper inclined bed or surface —23—, thereby causing the perfect peas, which are hard and elastic, to rebound over the upper edge of the partition —25— and upon the inclined way —32—, from which they fall upon the conveyer —34—, while the broken or soft peas and refuse which are not elastic, simply slides across the face of the inclined bed —23— and finally fall upon the inclined chute —24—, thereby positively separating the perfect peas from the imperfect ones and refuse, such perfect peas being carried away by the belt —34— while the refuse is conveyed in the opposite direction by the chute —24—.

What I claim:

1. In a machine of the class described, a screen supporting frame and screen thereon, means to reciprocate the frame, a hopper above one end of the screen and having a movable bottom mounted upon one end of the frame and moving therewith across the open lower side of the hopper, a series of inclined plates arranged one above the other below the opposite end of the hopper and having their lower edges disposed in different vertical planes one in advance of the other from the top down, and a series of partitions one in front of the lower edge of each plate and spaced apart therefrom, each partition projecting above the horizontal plane of the low edge of its plate.

2. In a machine of the class described, a series of inclined plates having their low edges disposed in different vertical planes one in advance of the other from the top down, a bar flexibly connected to the higher ends of the plates and adjustable vertically to vary the inclination of said plates, each connection having a vertical adjustment along the bar whereby each plate may be separately adjusted.

3. In a machine of the class described, a series of inclined plates arranged one above the other with their low edges in different vertical planes one in advance of the other from the top downward, a vertically adjustable bar, connections between said bar and plates, a toothed rack on the bar and a pinion meshing with the toothed rack whereby the bar may be adjusted vertically.

In witness whereof I have hereunto set my hand this 8th day of August, 1905.

IRVING S. MERRELL.

Witnesses:

H. E. CHASE,
HOWARD P. DENISON.