No. 738,894. PATENTED SEPT. 15, 1903.

J. H. EMPSON.

PEA SHELLING MACHINE.

APPLICATION FILED MAR. 31, 1902.

NO MODEL. 4 SHEETS—SHEET 1

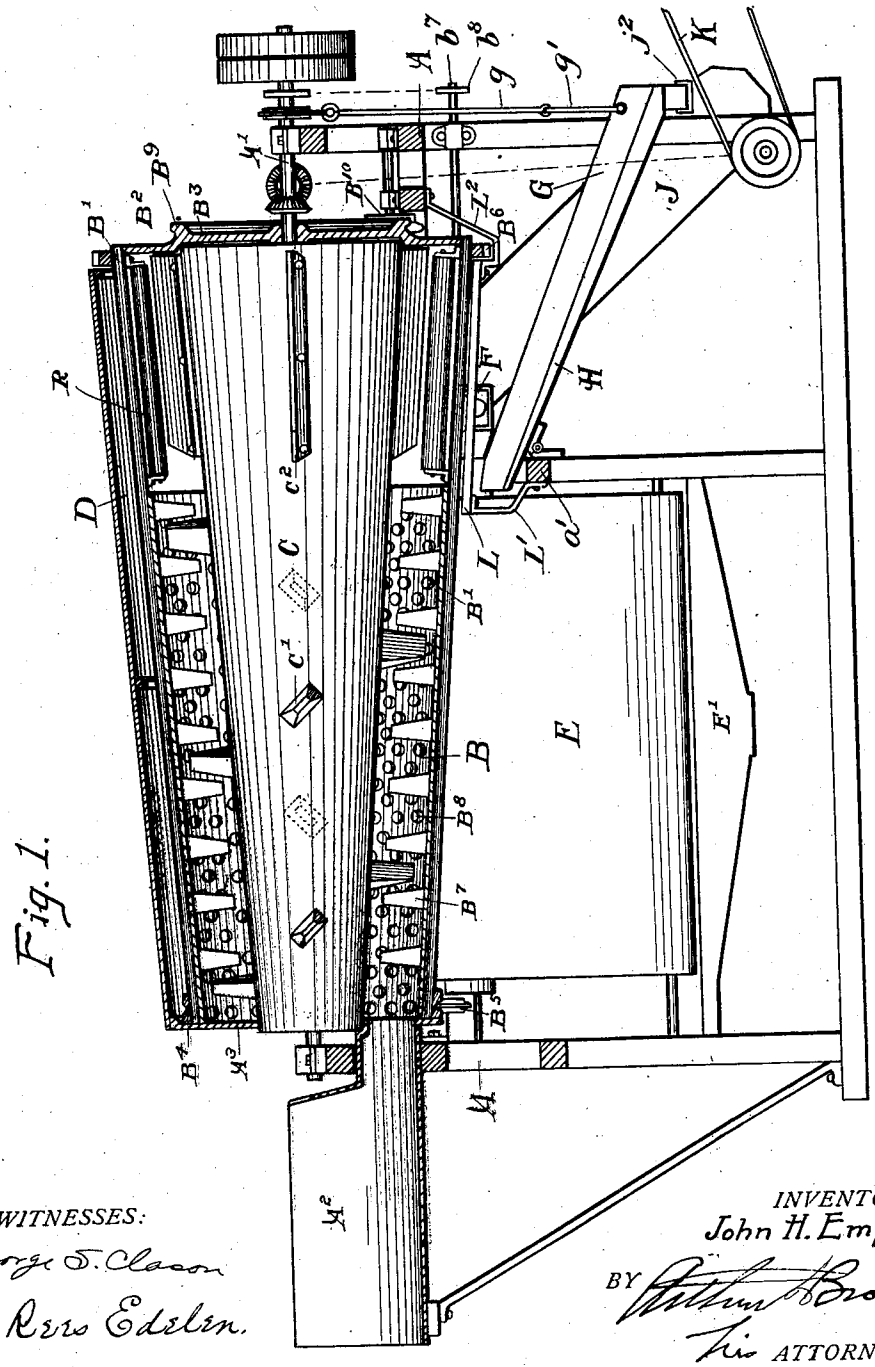


Fig. 1.

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NO MODEL. 4 SHEETS—SHEET 2.

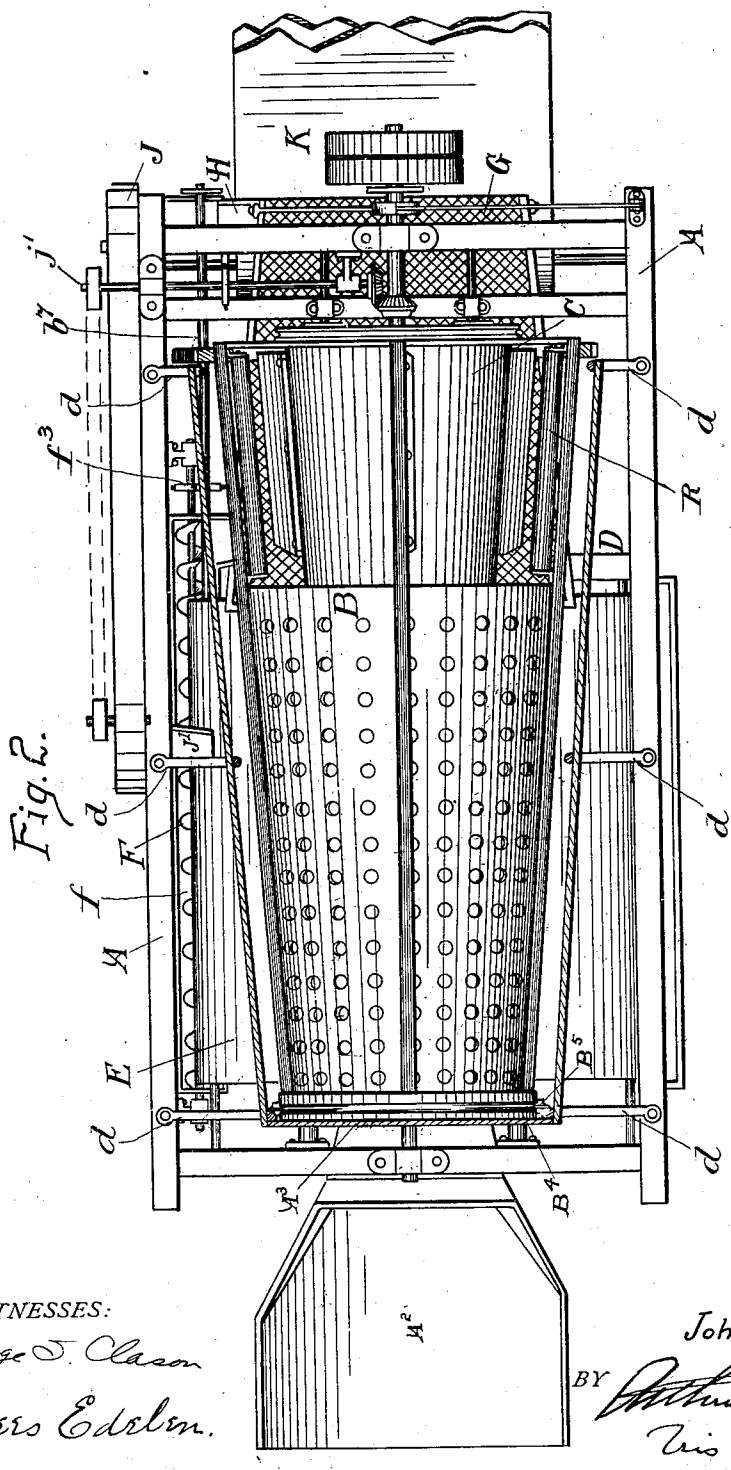


Fig. 2.

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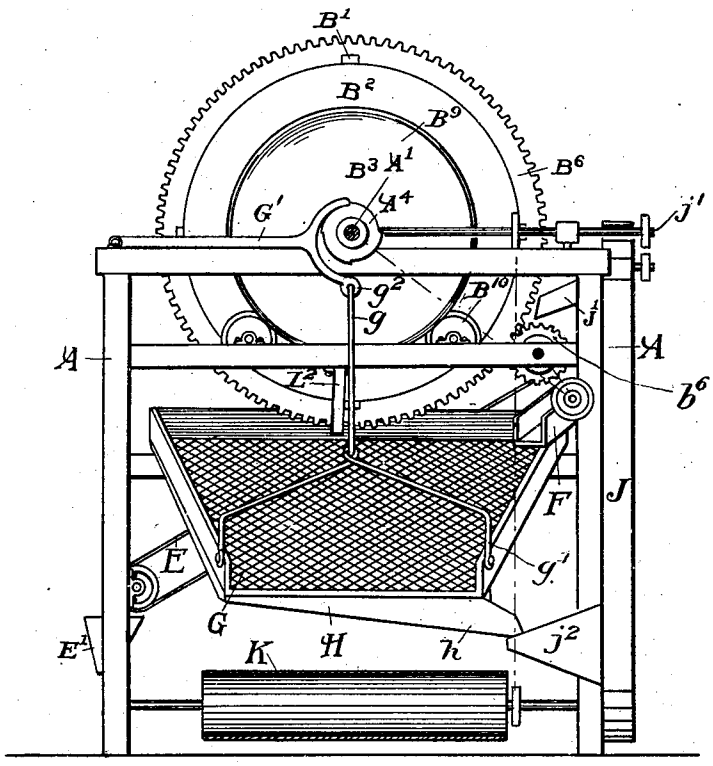
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NO MODEL. 4 SHEETS—SHEET 3.

Fig. 3.



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NO MODEL. 4 SHEETS—SHEET 4.

Fig. 4.

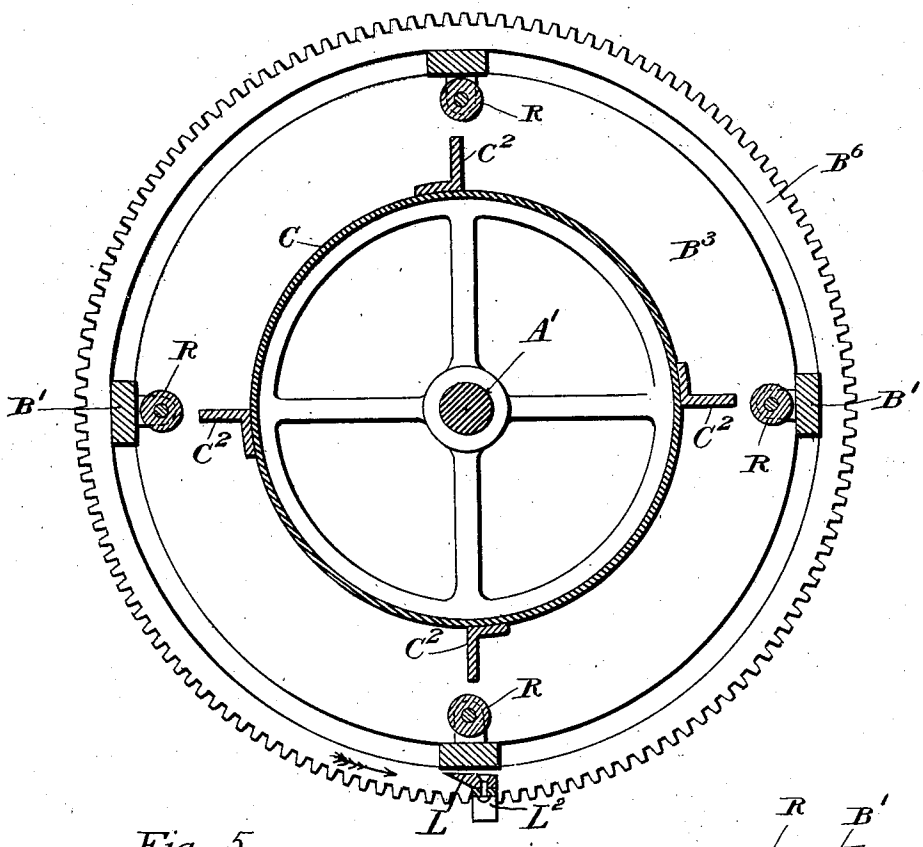
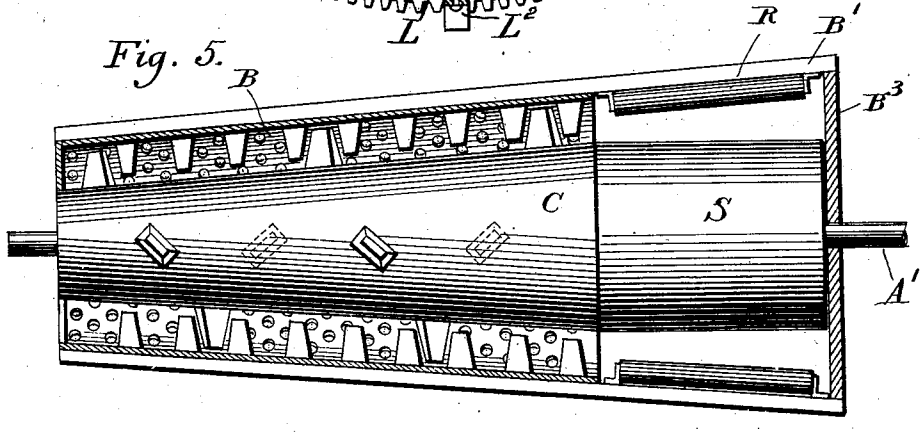


Fig. 5.



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No. 738,894. Patented September 15, 1903.

UNITED STATES PATENT OFFICE.

JOHN HOWARD EMPSON, OF LONGMONT, COLORADO.

PEA-SHELLING MACHINE.

SPECIFICATION forming part of Letters Patent No. 738,894, dated September 15, 1903.

Application filed March 31, 1902. Serial No. 100,743. (No model.)

To all whom it may concern:

Be it known that I, JOHN HOWARD EMPSON, a citizen of the United States, residing in Longmont, in the county of Boulder and State of Colorado, have invented certain new and useful Improvements in Pea-Shelling Machines, of which the following is a specification.

This invention relates to improvements in pea-shelling machines, and is designed more particularly as an improvement on that type of machine or machines for hulling or shelling green peas on the vine shown and described in United States Letters Patent No. 546,095, September 10, 1895, and No. 604,377, May 24, 1898, granted to myself.

In machines heretofore made and used it has been found that the side-delivery type is more satisfactory, and in such machines it has also been found that in the lateral or radial discharging of the vines provisions should be made to prevent the vines from winding on the driving-shaft of the inner cylinder or drum and that means should also be provided for effectively discharging the vines from the machine onto the carrier. Again, in certain types of machines it has been heretofore suggested to extend the inner rapidly-rotating drum beyond the end of the outer slowly-rotating drum, so that the discharge of the vines will take place at the end of the outer drum, and to prevent the vines being tangled around the shaft the inner drum was extended a long distance beyond the outer drum. Such constructions, however, resulted in the throwing of the vines laterally in all directions, and it was also found that the vines would ultimately gather around the shaft at the end of the inner drum.

The present invention is designed to overcome the objections heretofore existing in this known type of pea-shelling machines, and to that end consists in part in extending the outer drum to a point beyond the inner drum and capping the outer drum in a manner to form a joint between the same and the inner drum, thus preventing the vines from coming in contact with the shaft and at the same time providing substantially free radial or lateral delivery of the vines from the outer drum, and also in providing such a machine with a hood or casing, so that the vines will be discharged at the proper point onto the vine-removing conveyer.

A further object of the invention is to provide a machine wherein a more complete separation of the shelled peas from the pods and vines is obtained than was heretofore possible in the prior constructions of machines, and, finally, the invention consists in the construction and arrangement of parts presently to be described.

In the accompanying drawings I have shown a machine embodying the invention; but it is to be understood that various modifications and changes may be made without departing from the nature and principle of the invention therein disclosed.

Figure 1 is a longitudinal sectional view of a pea-shelling machine, showing parts in elevation. Fig. 2 is a plan view of the machine, showing the casing in section. Fig. 3 is an end elevation looking from the rear of the machine. Fig. 4 is a cross-section at the discharge end of the machine. Fig. 5 is a longitudinal section of the outer and inner drums, showing a modification.

In the drawings, A represents a supporting-frame, being of rectangular formation, while B designates the outer perforated slowly-rotating drum, which is conveniently in the form of the frustum of a cone having its largest diameter at the rear or discharge end of the machine. The drum B is supported at both ends on caster or carrying wheels B^5 and B^{10} in the usual manner. A hood or casing D covers the drum B and is supported by suitable straps *d* from the upper bar of the main frame A. The drum B is provided at different points on its circumference with longitudinal stringers or rods B', extending from its extreme forward end to a point considerably beyond the rear edge of the perforated portion. The rear ends of these bars or rods are connected and supported by a disk or end plate B^3, the outer portion of which is dished forward, as at B^2, thus forming a recess or cavity at the center of the disk or plate, for reasons presently to be stated. The plate B^3 is provided with a

central bearing, through which the driving-shaft A′ loosely extends, the latter being conveniently mounted in suitable bearings.

The construction thus described constitutes, in effect, a single member, which I shall term for convenience the "outer" drum, and as constructed it will be observed that between the plate B^3 and the rear edge of the perforated section is a practically continuous open space, interrupted only by the relatively small bars B′. There are conveniently four of these bars arranged an equal distance apart, as shown in Fig. 4, so that the free delivery of vines may be had between the bars. A track B^4 is fixedly secured to the outer surfaces of the bars B′ at the forward or feed end and is grooved to receive the periphery of the supporting-casters B^5, as shown in Figs. 1 and 2. A similar track B^9 on the plate B^3 receives the casters B^{10}.

C designates the rapidly-rotating inner drum of frusto-conical shape having its forward edge projected through an opening in the end plate A^3 of the hood D and its rear edge extended into the recess or depression of the end cap-plate B^3, thus providing a substantial closure against the movement of the vines or other material past the ends of the inner member of the shaft A′. The inner drum is of sufficient diameter to prevent the vines wrapping themselves thereon. The inner drum C and outer drum B are provided with teeth or blades C′ and B^7, respectively, while the outer drum, as above stated, is formed with a multitude of perforations B^8, through which the shelled peas escape onto the endless carrier E, arranged immediately below the same. This carrier is inclined and arranged transversely of the machine, and its upper face travels in an upward direction in a manner well known. The peas falling onto the carrier are received into a hopper E′, while any pods or portions of the vines which have passed through the perforations cling to the carrier E and are carried up and discharged into a conveyer-trough F, from whence they are conveyed by a screw conveyer toward the rear end of the machine, where they are discharged at the screen G. Said screen G is an inclined shaking screen located directly below the rear end of the outer drum, the same being supported at its upper forward end on the cross-bar a' of the frame, while its lower end is carried by a link g, connected with a bail g', which in turn is pivotally connected to the sides of the screen. The upper end of the link g is connected with a rock-arm G′, pivoted at its outer end to the frame and forked at its inner end. The lower member of the fork has an eye g^2, with which the link engages, while the upper member of the fork is curved and rests on a cam-wheel A^4, mounted on the shaft A′. By this construction the rotation of the shaft A′ causes a rapid up and down movement of the end of the screen G, serving thereby to sift through the meshes of the screen any peas and refuse that may have passed out of the end of the perforated portion of the outer drum B with the vines. Such material as passes through the screen is collected in a hopper H, formed on the bottom of the screen-frame and is conducted therefrom through a transverse spout h thereof to a fixed hopper j^2, discharging into an elevator-boot J, located at the side of the machine. In the boot J may be placed any convenient form of elevating means, and the peas, together with such portions of the pods or other material which have been discharged into the same, are transferred up and discharged through a spout J′ onto the upper end of the belt E, the peas being there separated by rolling down the belt, while the refuse clings to the belt and is carried up by the movement of the belt E and discharged into the conveyer-trough f and again conducted to the screen. The vines and pods are discharged from the lower end of the screen onto any convenient form of conveyer, as K. The screw conveyer F may be driven in any convenient manner, as well as the conveyer K.

On the extreme rear end of the inner drum B is secured a gear B^6, with which a pinion b^6 engages, which in turn is mounted on a shaft b^7, provided with a driven wheel b^8, over which a suitable endless transmitter may be passed, connecting it with a driving-wheel on the shaft A′, thereby securing a slow rotation of drum B relatively to that of drum C. On the shaft b^7 is mounted a driving-roller for the endless belt E, and the shaft of the conveyer F is driven by a sprocket connection f^3 with the shaft b^7. The conveyer of the elevator-boot J is driven from the shaft A′ through a shaft j', geared to the driving-shaft and belted to the driving-pulley of the conveyer, as shown in Fig. 2, dotted lines. The conveyer K is driven by a chain or other suitable connection extending from the shaft j' or a driving-wheel thereon to its corresponding wheel on the driving-roller of the conveyer K. It is to be understood that any suitable mechanism can be employed for driving the various parts in lieu of those just indicated.

To insure the discharge of the vines from the outer drum B, wings c^2 are secured on the extreme rearward end of the inner drum C, the same extending out at right angles, and being of uniform width their outer edges project in close proximity to the inner surfaces of rollers R, carried by the rods B′, so that the wings will act not only as means for positively driving the vines laterally from the machine, but will also tear and remove any vines which may become entangled on said rollers. Said rollers, which are interposed between the bars B′ and wings c^2, aid in the discharge of the vines, since if any vines should lodge thereon they will be discharged, because the rollers will turn as the outer

drum rotates. A stationary knife L is provided supported by brackets L′ L^2 (see Fig. 7) in close proximity to the path of the outer edges of the bars B′ to cut away vines which may catch on said bars.

A^2 is a feed-hopper at the forward end of the machine, having a contracted throat entering the lower portion of the forward end of the outer drum B, as shown in Fig. 1.

In operation the driving-gear is so arranged and positioned that both the inner drum B and and the outer drum C will be rotated at relatively different rates of speed for purposes well understood in this art, and as the vines are passed into the feed-hopper A^2 to the outer rotating drum B they are thoroughly threshed, the peas falling through the perforations while the vines are worked rearward until they meet the rapidly-rotating beaters or wings C^2 on the inner drum, which forcibly eject the vines laterally or radially onto the movable screen G. The casing D, which extends over the entire machine, prevents the vines or peas from being scattered or thrown out of the machine, deflecting the same onto the apron E or into the screen-spout G.

As above stated, the machine is of that compact nature and construction that the entanglement of the vines around the shaft is prevented.

In Fig. 5 is shown a modification of the inner drum C, which here terminates at approximately the place where the perforated portion of the outer drum B ends. The remainder of the space occupied in the principal construction (of Figs. 1 to 4) by the prolonged end of the inner drum is filled by a loose drum S, extending from the end of drum C to the rear head or plate B^3 of the outer drum. This drum S is loose on the shaft A′, and consequently does not throw the vines forcibly against the rollers R and bars B′. If, however, vines accumulate on this drum S, it is free to rotate in accordance with the preponderance of the vines, so that the vines then drop down between the bars B′. This drum S constitutes, in effect, a non-rotary extension of the inner drum C.

Having thus described the invention, what is claimed as new, and desired to be secured by Letters Patent, is—

1. A pea-shelling machine having, in combination, a frame, a rotary outer drum having a perforated section and an open-sided section at the rear of the perforated section, an inner drum inclosed peripherally and at the discharge end within the outer drum, and means for rotating the two drums.

2. A pea-shelling machine having, in combination, an inner drum, a perforated outer drum, having transverse vine-discharge openings at its rear end, and a rear end plate located in close proximity to and extending laterally beyond the inner drum, and means for driving the two drums.

3. A pea-shelling machine having, in combination, an inner drum and an outer drum having an open portion, an end plate on the outer drum having a recessed portion into which the rear end of the inner drum projects, and means for driving the two drums.

4. A pea-shelling machine having, in combination, an inner drum, an outer drum comprising a perforated portion, longitudinal bars extending rearwardly therefrom, a plate on the rear end of the bars located in close proximity to the inner drum and projecting laterally beyond the same, and means for driving the two drums.

5. A pea-shelling machine having, in combination, shelling instrumentalities comprising inner and outer rotating drums with means for driving the same, of a screen located below the rear end of the drums, means for jarring the screen, a conductor below the screen, an elevator to which the conductor leads, and a separating-belt onto which the elevator discharges.

6. A pea-shelling machine having, in combination, an inner drum, an outer drum having a perforated portion, and an open-sided portion, a vibrating screen located below the rear of the outer drum, a separating-belt, and means for conducting the material passing through the screen back to the separating-belt.

7. A pea-shelling machine having, in combination, an inner drum, an outer drum having perforated and open-sided portions, a plate at the end of the outer drum located in close proximity to the end of the inner drum, means for driving the two drums, and a hood embracing the upper portions of the drums.

8. A pea-shelling machine having, in combination, an inner rotating drum, an outer rotating drum having a perforated and an open-sided portion, an end plate for the outer member, means for driving the drums, and wings on the inner drum opposite the open-sided portion of the outer drum for forcibly ejecting the vines laterally through said open-sided portion of said outer drum.

9. A pea-shelling machine having, in combination, an inner drum, an outer drum having a perforated portion, and an open-sided portion, bars extending from the perforated portion, an end plate connected with the bars, discharging-wings on the inner member opposite the bars, and means for driving the drums.

10. A pea-shelling machine having, in combination, an outer drum having a perforated section, a head, and skeleton ribs extending from the perforated section to the head and providing between them lateral discharge-openings, and an inner drum within the perforated section of the outer member and extended to the said head to prevent the winding of the vines.

11. A pea-shelling machine having, in combination, an inner drum and an outer drum,

having ribs, discharge-openings between said ribs, and rollers extending lengthwise of and inside of the said ribs, and located between said ribs and the inner drum.

12. A pea-shelling machine having, in combination, an outer rotating drum with vine-discharging openings at its sides, and provided with bars at its periphery, and a coöperating vine-cutting knife at the discharge end which does not partake of the rotation of the drum and past the edge of which said bars travel during the rotation of the drum.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

JOHN HOWARD EMPSON.

Witnesses:
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