Dec. 2, 1930. J. ZEB 1,783,489

PEA OR LIKE MATERIAL SPLITTING MECHANISM

Filed May 20, 1929 2 Sheets-Sheet 1

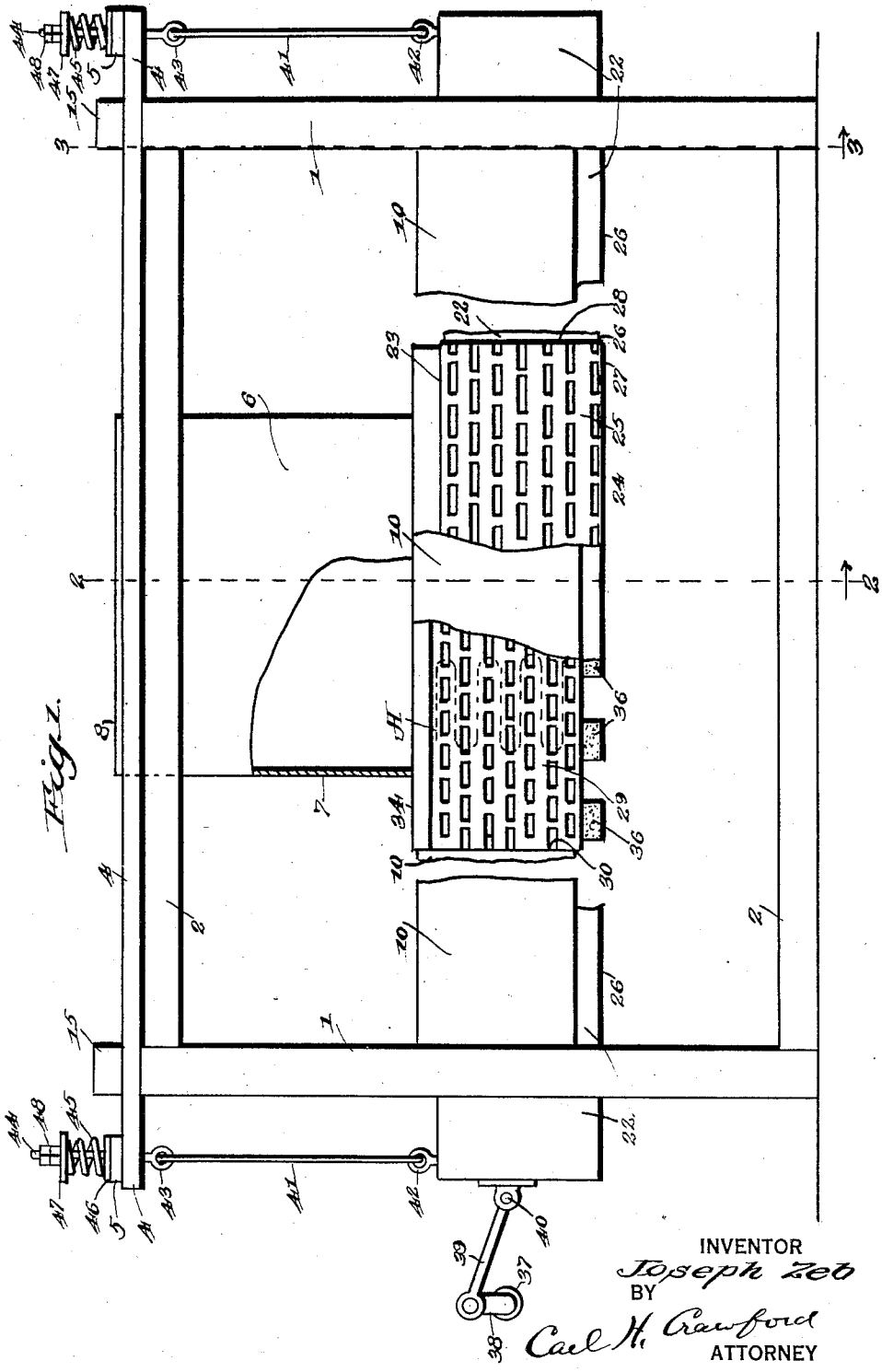


Fig. 1.

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PEA OR LIKE MATERIAL SPLITTING MECHANISM

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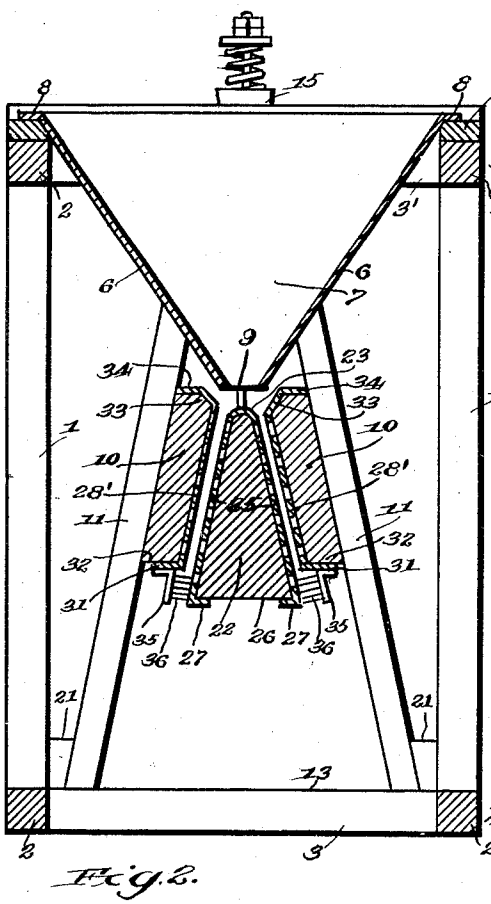


Fig. 2.

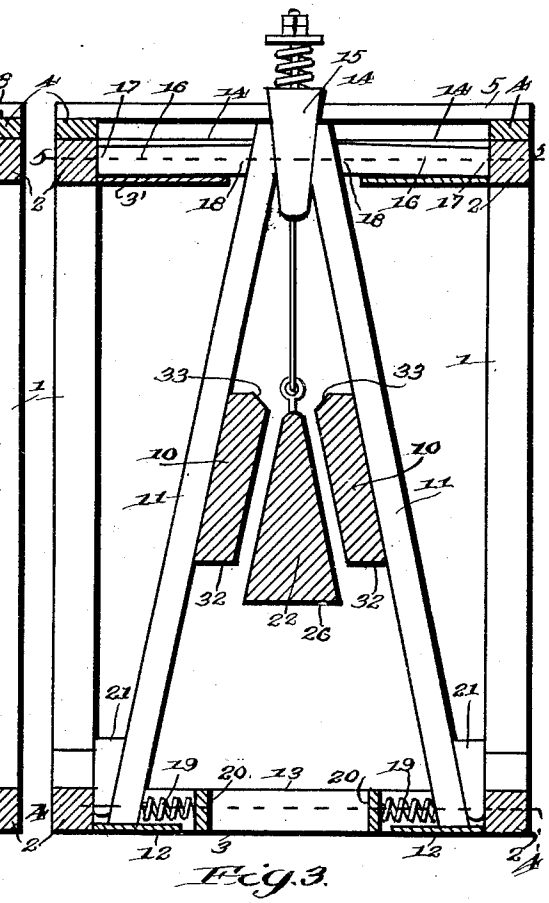


Fig. 3.

Fig. 6.

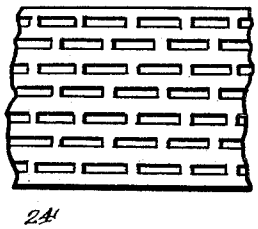


Fig. 4.

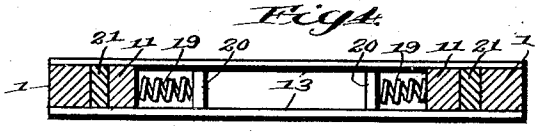
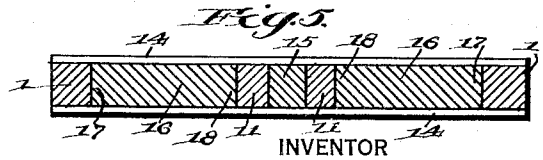


Fig. 5.



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PEA OR LIKE MATERIAL SPLITTING MECHANISM

Application filed May 20, 1929. Serial No. 364,469.

The object of this invention is to provide an improved mechanism for splitting peas or like material.

When peas are split they are substantially dry and considerable pressure impact is necessary to disrupt the hull thereof. Besides disrupting the hull, it is necessary to remove the same. However, it is necessary to avoid crushing the peas as that would greatly reduce their market value. Hence, the invention is not addressed to the crushing function but is limited to what might be broadly termed the splitting or shelling of most any edible which of course have not the hardness of earthen matter.

It is a feature of the invention to feed the peas or like material by gravity to the splitting mechanism thereby imposing on the latter the work of taking in material just as rapidly as the same is split.

The invention involves relatively movable splitting members between which the material is fed, said members having suitable splitting areas or surfaces adapted to act upon the interposed material.

It is a feature of the invention to provide one of the movable members with a floating mounting so that such member will yield or take any position responsive to the resistance of the material acted upon.

A further feature consists in yieldingly mounting the floating member so that the latter can yield responsive to bulking or wedging of the material thereby releasing the latter to avoid crushing and eliminating wedging.

A further feature is to provide relatively inclined splitting surfaces with means for varying the relative inclination thereof to thereby alter the action of the mechanism.

A further feature consists in a novel form of suspension or mounting of the movable splitting member so that when the latter is actuated, it will partake of a variety of movements thereby increasing the splitting coaction with the remaining member or members.

The invention has many other features and objects which will be more fully described in connection with the accompanying drawings and which will be more particularly pointed out in and by the appended claims.

In the drawings:

Fig. 1, is a view in side elevation, partly broken away, and showing the most improved form of the device of my invention.

Fig. 2, is a vertical sectional view on line 2—2 of Fig. 1.

Fig. 3, is a sectional view on line 3—3 of Fig. 1.

Fig. 4, is a sectional view on line 4—4 of Fig. 3.

Fig. 5, is a sectional view on line 5—5 of Fig. 3.

Fig. 6, is a fragmentary face view of a portion of a splitting surface of one of the members.

Like characters of reference designate similar parts throughout the different figures of the drawings.

As shown, the device of my invention includes a frame which consists of upright frame members 1 rigidly connected with horizontal frame members 2, and transverse frame members 3, the latter being of a special construction that will be later described. Supporting longitudinal frame members 4 extend beyond the ends of the frame structure proper and are connected by transverse members 5.

A means for feeding the material to be split, by gravity, is shown in the form of a hopper having converging side walls 6 and vertical end walls 7. The tops of the side walls 6 are suitably bent over and secured at 8, as clearly shown in Fig. 2. The discharge end 9 is located and proportioned in a manner to deliver the material to be split between the splitting members to be presently described.

The invention includes coacting splitting members and in the most preferred construction, I employ inner and outer splitting members.

As illustrated, the outer members are in the form of bars 10 of identical construction and function hence only one need be described in detail and like reference characters are applied to both, and reference to one will include both.

The bars 10 are shown horizontally disposed and extend substantially throughout the length of the frame. At their ends, said splitting bars are rigidly secured to adjusting bars 11 which are inclined toward each other from their lower toward their upper ends, as shown in Fig. 3. The lower transverse members 3, are shown of hollow construction with bottoms 12 and sides 13 and the lower ends of the adjusting bars 11 are supported on the bottoms 12, and the side member 13 will retain the lower ends of the bars 11 in place.

The upper ends of adjusting bars 11 project into the transverse members 3' and are held in line by the side portions 14 thereof.

It is an important feature of my invention to provide adjustment for the splitting bars 10 whereby the latter can not only be adjusted toward and away from each other with the same relation retained as illustrated in Fig. 3, but also whereby the bars 10 can be adjusted to change their relative converging position with respect to each other, and I will now describe this feature.

At the tops of said adjusting bars 11, I provide adjusting means which is shown in the form of a separating wedge 15 which may be depressed to separate the upper ends of bars 11 or may be elevated to dispose the upper ends of bars 11 in closer relation. Either adjustment would, as will now be clear, change the angular or converging relation of the splitting bars 10, with respect to each other, from the position shown in Fig. 3. I have provided means for retaining such adjustments which may be in the form of retaining wedge bars 16. The outer ends 17 of said wedge bars 16 abut against frame members 1, and the inner ends 18 abut against the outer faces of the upper ends of bars 11. The inner ends 18 are suitably elevated when it is desired to lower wedge 15 and lowered when said wedge 15 is elevated. Thus when wedge 15 is lowered, the upper portions of bars 10 are separated and when wedge 15 is elevated, the upper portions of bars 10 are brought into closer relation.

As regards the lower ends of adjusting bars 11, they are held in spaced relation by means which may be in the form of springs 19 that are interposed between said ends and suitable abutments 20. It will later be clear that the tendency of the interposed material will always be to spread the lower ends of bars 11, apart from each other. To adjust said lower ends toward each other I provide means which may be in the form of wedges 21 which are adapted to be driven downwardly to move said bars 11 toward each other and contract the convergence of the lower portions of bars 10. If the wedges 21, are elevated, then the convergence of bars 10 is increased.

It will thus be seen that I have provided adjusting devices operable above and below the splitting bars for altering the angular relation thereof, and at the same time maintaining said bars substantially rigid.

I will next describe that element or member of the mechanism whereby I obtain such relative movement of the splitting members as may be necessary to split the interposed material.

As shown, I employ an intermediate splitting member or element that is disposed between the splitting bars 10 and which is shown to have a cross section of an inverted V-form, as indicated at 22. As shown, this member is solid in cross section but this is not essential to the invention. The intermediate member 22 has outwardly facing and downwardly and outwardly inclined flat splitting faces which may be formed of any suitable material. I have shown the member wrapped with sheet metal 23, having suitable openings 24, the splitting faces being indicated at 25. In practice, the metal forming the splitting faces extends over the apex of said member and downwardly to and is bent under the bottom 26, where it may be anchored as indicated at 27.

As shown more particularly in Fig. 1, the material forming the splitting faces extends subjacent the discharge end 9 of the hopper and lengthwise of the member 22 a sufficient distance beyond the ends of the hopper to operate on any material that may require such range of area. At 28, I have designated one terminal end edge of the material.

Likewise, the splitting bars 10 have correspondingly inwardly facing flat splitting faces 28, which may be formed of the same material as that applied to the intermediate member 22, and which is designated at 29, said sheet material 29 terminating at 30, abreast of the terminals 28, of the intermediate member 22. The lower edges 31, are bent under and suitably secured to the bottom edges 32, of bars 10. Said bars 10 are chamfered at 33 to form a converging intake for the material and the upper edges of the splitting sheet forming material are extended over and secured to the tops of bars 10, as indicated at 34.

It will be noted that the apex of member 22, is slightly below the top edges of bars 10 thereby insuring a supply of material to be split on both sides of intermediate member 22 and between the latter and said bars 10, as will be clearly seen in Fig. 2. The lower portion of bar 22 extends below bars 10, and in order to free the faces 25, below bars 10, from the hulls of split peas, I provide means which may be in the form of suitable brushes having backs 35 secured to bars 10, and bristles 36, adapted to engage faces 25, below bars 10.

It may be stated that the usual adjustment will be such that a slightly greater space will

be provided near the tops of the coacting splitting bars than near the bottoms thereof.

Means is provided for causing relative movement of the splitting members to effect the performance of the splitting function.

In the present case, I preferably apply such motion to the intermediate member 22, and as shown, such motion is of a reciprocating nature. Thus I have shown a shaft 37, which may be driven from any suitable source of power and which is provided with a crank 38. Said crank 38 is connected with member 22 by a connecting rod 39, at 40, so that as the crank turns, to and fro movement will be imparted to the member 22.

In many cases, a strictly reciprocating movement would be efficient and operative for the purpose but it is a feature of this invention to cause a variable relative movement of the splitting bars and I accomplish this object by a novel suspension of the actuated member, which, in the present embodiment, is the intermediate member.

Hanger rods 41 are connected at their lower ends to said member 22, at 42, which forms a pivotal connection, and the upper ends of said rods are supported by eyes 43 having rods 44 which extend upwardly through cross frame members 5. Thus it will be clear that the member 22, is pivotally suspended and that its points of suspension are remote from the splitting faces and near the ends of said member 22. Thus, as said member 22 is reciprocated, it swings in an arc and hence the faces 25, not only reciprocate abreast of faces 28, but also diagonally thereof. Further, by reason of the arc in which the member 22 swings, the faces 25 have an upward and downward movement with respect to faces 28.

In actual practice, I have obtained highly efficient results by imparting a relatively short length stroke to member 22, say for instance, from two and one half to four inches each way. With this short stroke, and with a crank revolution of from one hundred to one hundred and twenty revolutions per minute, I prevent a too sudden descent of the material being split and cause the latter to take a circuitous path generally indicated by dotted line A, in Fig. 1, and I thereby insure a more efficient splitting operation.

It will now be clear that the intermediate member 22 is floatingly suspended between the bars 10 and hence is capable of assuming various positions dependent or responsive to the action of the material on opposite sides of said intermediate member.

It is also a feature of my invention to yieldingly suspend said intermediate member.

Hence, the rods 44 extending upwardly through cross members 5, extend through springs 45 and the latter are seated on abutment discs 46. Like discs 47 are mounted on said springs 45 and the rods 44 extend through said discs and are threaded and provided with nuts 48. This construction not only affords a yielding suspension but an adjustable suspension. By this means, the springs 45 will yield responsive to clogging or bulking of material being split, and by reason of the adjustability afforded, I am able to raise or lower member 22, thereby reducing or enlarging the splitting spaces, respectively, independently of any adjustment of the bars 10, or in harmony with adjustment of the latter.

While the operation of the device of my invention may be clear from the foregoing, it will be briefly recapitulated.

In practice, a supply of peas or other material to be split is deposited in the hopper before the mechanism is started and hence material is delivered to the tops of the spaces between the splitting members and may freely enter between the same for a slight distance downwardly. This initial entrance is rendered possible by the fact that the spaces are greater at the top than near the bottom. After the material has slightly entered on both sides of the floating intermediate member 22, the latter is started and as the feed is by gravity, the material continues to enter the spaces just as rapidly as the machine splits and advances previously entered material.

As the material descends in the spaces and is split, it finally emerges from the lower open spaces and may be caught on the floor or in any suitable receptacle.

The bristles 36 will not prevent discharge of the material as they are preferably in sections and they serve to remove any hulls that may stick to the surfaces 25 below the bars 10.

It is believed that the invention will be clear from the foregoing description, and while I have herein shown one specific form of my invention, I do not wish to be limited thereto except for such limitations as the claims may import.

I claim:

1. In a pea or like material splitting mechanism, companion members having inwardly facing splitting surfaces, an intermediate member between said companion members having outwardly facing splitting surfaces in splitting spaced relation to said inwardly facing surfaces, means for discharging material to be split into the spaces between said members, and means for causing relative and variable movement of said members to split the interposed material.

2. In a pea or like material splitting mechanism, companion fixed members having downwardly and outwardly inclined inwardly facing flat splitting surfaces in opposed relation, a pea splitting element between said members having outwardly and downwardly inclined outwardly facing flat splitting surfaces in spaced splitting relation with respect

to said inwardly facing surfaces, means for delivering material to be split on both sides of said element and between said members, and means for actuating said element to split the interposed material.

3. In a pea or like material splitting mechanism, companion fixed members having downwardly and outwardly inclined and inwardly facing splitting surfaces in opposed relation, an intermediate pea splitting element having outwardly facing splitting surfaces correspondingly inclined with respect to said inwardly facing surfaces, means floatingly supporting said element, means for delivering material to be split on both sides of said element and between said members, and means for reciprocating said floating element to split the interposed material.

4. In a pea or like material splitting mechanism, companion fixed members having downwardly and outwardly inclined and inwardly facing splitting surfaces in opposed relation, an intermediate floating pea splitting element having outwardly facing splitting surfaces correspondingly inclined with respect to said inwardly facing surfaces and coacting therewith, means yieldingly and adjustably supporting said floating element between said members whereby said element may be raised or lowered to alter the intervening spaces between said members and element and partake of a variable movement, means for delivering the material to be split into the spaces between said members and element, and means for reciprocating said element to split said material.

5. In a pea or like material splitting mechanism, companion fixed bars having downwardly and outwardly inclined inwardly facing splitting surfaces in opposed relation, an intermediate inverted V-shaped bar interposed between said fixed bars and having outwardly facing splitting surfaces in spaced splitting relation with respect to said inwardly facing surfaces, and the spaces between said bars opening downwardly for discharge of the split material, means for delivering material to be split into the tops of said spaces on both sides of said intermediate bar and between said fixed bars, and means for imparting movement to said intermediate bar to split the interposed material.

6. In a pea or like material splitting mechanism, inner and outer bars having coacting inclined splitting surfaces, means for reciprocating said inner bar, and means pendently suspending said inner bar near its ends in floating relation between said outer bars, whereby reciprocating movement will impart endwise and diagonal movement to splitting surfaces of said inner bar with respect to the splitting surfaces of said outer bars.

7. In a pea or like material splitting mechanism, inner and outer bars having coacting inclined splitting surfaces, means for adjusting said outer bars to vary the inclination of said surfaces with respect to each other, means floatingly suspending said inner bar adapted to take variable lateral positions with respect to said outer bars, means for adjusting said inner bar to vary the inclination of the surfaces, and means for imparting movement to said inner bar to split the interposed material.

8. In a pea or like material splitting mechanism, inner and outer members having coacting inclined splitting surfaces, means yieldably and floatingly mounting said inner member whereby the latter is adapted to take various lateral positions and move endwise and diagonally of said outer members, and means for imparting movement to said inner member to split the interposed material.

9. In a pea or like material splitting mechanism, inner and outer members having coacting inclined splitting surfaces, means floatingly suspending said inner member for variable lateral and diagonal movement thereof, means for actuating said inner member, and means for adjusting said outer members to vary the inclination of said splitting surfaces thereof with respect to the splitting surfaces of said inner member.

10. In a pea or like material splitting mechanism, inner and outer members having coacting splitting surfaces, means for actuating said inner member, and means yieldingly suspending said inner member to permit the latter to yield responsive to wedging or bulking of the interposed material between said members.

In witness whereof, I hereby affix my signature.

JOSEPH ZEB.