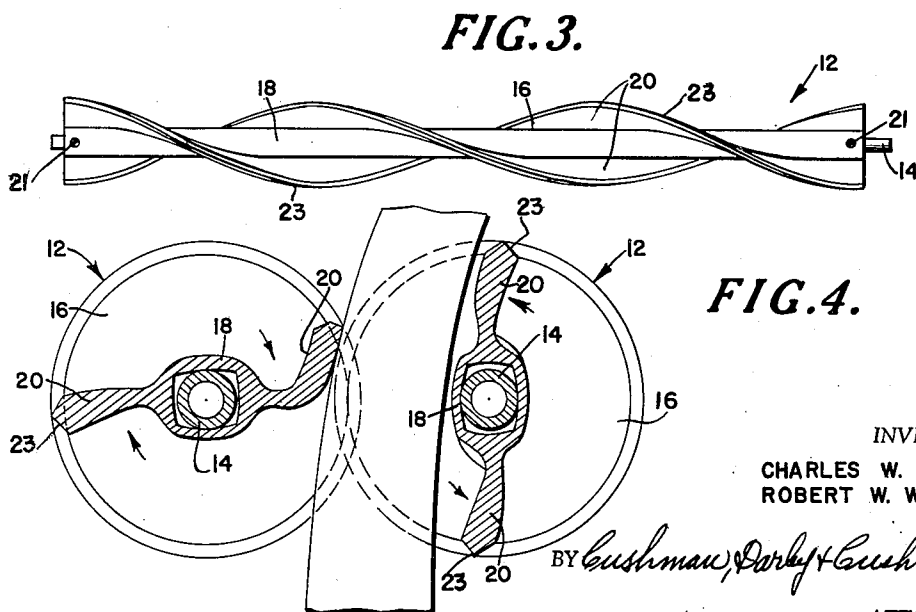
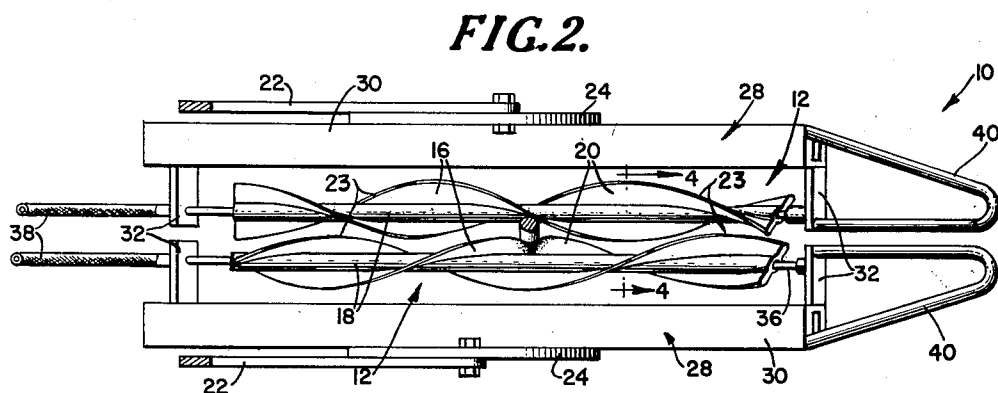
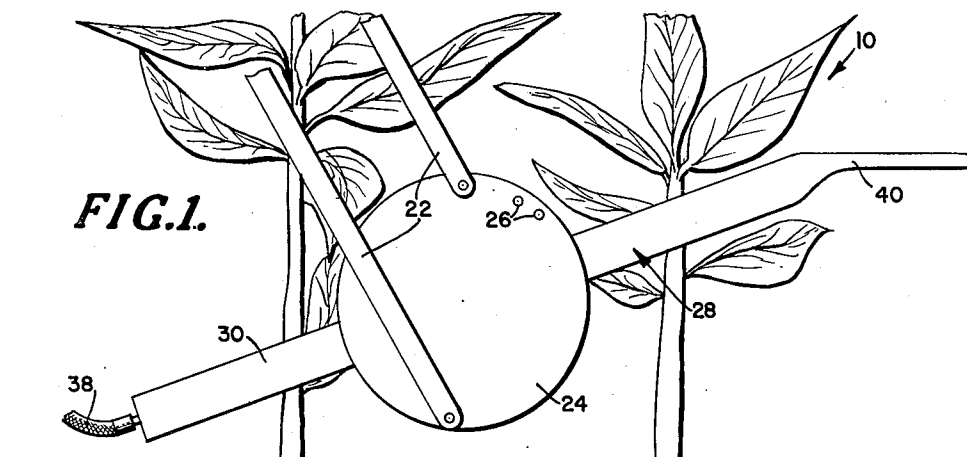


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TOBACCO PRIMING DEVICE

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2,834,174

TOBACCO PRIMING DEVICE

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5 Claims. (Cl. 56—27.5)

This invention relates to tobacco harvesters and, more particularly, to a device for priming tobacco plants having an improved defoliating mechanism incorporated therein. This invention is an improvement upon the invention disclosed in co-pending application Serial No. 444,813, filed July 21, 1954, by Robert W. Wilson and now Patent 2,816,411.

The above-mentioned application discloses a tobacco priming device incorporating a defoliating mechanism capable of imparting downward impact blows to the tobacco leaves at a point adjacent their connection with the stalks as the device is moved along a row of tobacco plants. One difficulty encountered in this impact defoliating mechanism is that the tobacco leaves on some occasions are not completely separated from their stalks, the blow merely acting to deflect the leaf downwardly from the stalk so that it hangs to the stalk by tissue at the underside of the leaf at its connection with the stalk. It has been found that this disadvantage may be overcome by imparting a substantial wiping action to the leaves at a point adjacent their connection to the stalks, such wiping action insuring complete removal of the leaves.

Accordingly, it is an object of the present invention to provide an improved defoliating mechanism which is operable to remove the leaves from a tobacco plant with a wiping action so as to insure complete removal thereof.

Still another object of the present invention is the provision of a novel defoliating member which is simple in construction, easy to operate, and economical to manufacture and maintain.

These and other objects of the present invention will become more apparent during the course of the following detailed description and drawings.

The invention may best be understood with reference to the accompanying drawings wherein an illustrative embodiment is shown.

In the drawings:

Figure 1 is a fragmentary side elevational view of a tobacco priming device embodying the principles of the present invention and showing the same in its normal operative position along a row of tobacco plants;

Figure 2 is a top plan view of the device shown in Figure 1;

Figure 3 is an enlarged top plan view of one of the defoliating members; and

Figure 4 is an enlarged cross-sectional view taken along the line 4—4 of Figure 2.

Referring now more particularly to the drawings, there is shown in Figure 1 a tobacco plant priming device, generally indicated at 10, embodying the principles of the present invention. In general, the novel aspect of the device is concerned mainly with the defoliating mechanism incorporated therein, and, more particularly, to the individual defoliating members thereof.

As shown in Figures 1 and 2, the tobacco plant priming device is adapted to be moved along a row of tobacco plants with the defoliating mechanism disposed in up-

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wardly and forwardly inclined relation, so that the forward end thereof will initially engage the plants at the uppermost position of a vertical swath to be removed therefrom. As the device proceeds along the row, the defoliating mechanism will operate to remove the leaves within the swath from top to bottom. Preferably, the defoliating mechanism comprises a pair of opposed horizontally spaced defoliating members, generally designated at 12. These members are preferably identical, except for such changes as are necessary to make the same face in opposite directions. Stated differently, the two defoliating members are substantial mirror images of each other and, hence, a description of one should suffice to describe both. It will be understood, however, that the individual units are not restricted in their use to the combination illustrated, but may be utilized with other units imparting a similar or different action.

As best shown in Figure 3, the defoliating member 12 comprises a longitudinally extending shaft 14 which, in operation, is disposed in an upwardly and forwardly inclined position, preferably around 20° from the horizontal. Secured on the shaft in any suitable manner, is a leaf engaging element 16, preferably of a resilient material, such as rubber, plastic or the like. This resilient leaf engaging element includes a hollow hub portion 18 through which the shaft 14 extends, and a pair of oppositely directed radially extending webs 20 disposed in the helical arrangement about the shaft 14. The resilient element 16 is preferably initially extruded or otherwise formed in a flat endless strip and then cut to proper length. The helical formation or twist of the webs 20 is preferably provided when the resilient element is secured to the shaft by fastening opposite ends of the element to the shaft, as by bolts 21 or the like (see Figure 3), after appropriate twist has been given to the element. In this manner, the defoliating member of the present invention is susceptible to economical manufacture.

As best shown in Figure 4, each web 20 is relatively narrow at its connection with the hub portion and tapers gradually outwardly. The web 20 then terminates in an inwardly tapered outer edge 23 of a substantial V-shaped configuration in cross-section. This construction renders the webs sufficiently flexible to deflect inwardly upon engagement with a tobacco stalk so as to substantially surround the same. In this manner, the webs will contact substantially all of the leaves within the swath to be removed. In practice, it has been found that best results are obtained if the radial extent of the webs are substantially equal to the diameter of the hub portion with a slight overlapping with respect to each other as shown in Figure 4. In addition, in normal operation it is preferred that the pitch of the helix of the webs is approximately two revolutions for every yard. While the particular shape and relationship of the webs as outlined above is preferred, it will be understood that other web shapes and pitches may be utilized.

As was briefly mentioned above, the defoliating members are adapted to be utilized in pairs which have opposite pitches with respect to each other. The two defoliating members may be mounted in horizontally spaced relation by any suitable means so as to be moved along a row of tobacco plants, preferably by a vehicle sufficient to clear the tobacco plants so as to minimize damage thereto. One such vehicle is disclosed in the aforesaid application and it will be understood that the defoliating mechanism of the present invention may be propelled by this vehicle and that the leaves removed thereby may be handled by a conveyor system, such as illustrated in connection with the vehicle. It will also be understood that the defoliating mechanism of the present invention may be propelled by other means, such as a conventional farm tractor or

the like. For example, in Figure 1 there is illustrated the conventional parallel links 22 of a tractor, the free ends of which are pivotally connected to a vertical plate 24 of circular configuration. If desired, slots or additional pivot holes 26 are provided in the plate 24 to enable the associated defoliating member to be mounted in any one of a plurality of angularly adjusted positions.

Each of the defoliating members 16 is journaled within a generally U-shaped frame 28 rigidly secured intermediate its ends to the mid-portion of an associated plate 24. Each frame 28 includes an elongated longitudinal frame member 30 having a pair of parallel end frame members 32 extending laterally from the opposite ends thereof. The shaft 14 of the associated defoliating member is suitably journaled within the end members 32 and rotary motion is imparted to the defoliating member from a suitable source on the propelling vehicle through any appropriate means, such as flexible shaft 38.

It will be understood that suitable leaf deflecting means may be provided on the frame to minimize damage to the leaves which are not to be removed. For example, in Figure 2 there is shown a generally V-shaped guiding element 40 secured to the forward end of the frame which serves to direct the stalks between the cooperating defoliating members. Of course, other suitable shielding and deflecting means may be provided if desired.

In operation, the tobacco priming device is moved along a row of tobacco plants by a suitable propelling vehicle (not shown) so that the device will engage the plants throughout a vertical swath to thereby remove the leaves on the stalks disposed therein. The stalks are directed between the cooperating defoliating members by the guide elements 40 and with the two defoliating members rotating in opposite directions, the webs 20 thereof will engage the stalks with a downward wiping action plus some impact due to the speed of rotation. Moreover, the defoliating members serve as screws which aid in feeding the stalks therebetween. As briefly mentioned above, the construction of the webs is such that engagement of the stalks therewith will cause inward deflection of the same so that they will substantially surround the stalk and contact substantially all of the leaves adjacent thereto. It must be borne in mind that the leaves of a tobacco plant extend outwardly from the stalk in substantially spiral formation so that in order to insure that all of the leaves in a given vertical swath will be removed, it is necessary to provide cooperating defoliating members which engage the plants from both sides.

As shown in Figure 2, it is preferable to dispose the webs of the two defoliating members so that when the webs of one are extending vertically in a given transverse plane, the webs of the other will extend horizontally in the same transverse plane. In this manner, the webs cooperate so as to apply an even pressure during the passage of the stalk therethrough. In other words, it is preferable to offset the adjacent crest of the webs so that two crests will never be in engagement with the stalk at the same time. However, while this relationship is preferred, it is by no means critical and applies mainly to the particular embodiment disclosed wherein each defoliating member includes a pair of webs spaced 180° apart. It will be understood that each defoliating member may include only a single web or may be provided with three or more webs.

By virtue of the fact that the webs are continuous throughout the longitudinal extent of the defoliating member, they will engage the leaves adjacent their connection with the stalk with a smooth, continuous action so as to push or rub the leaves free from the stalk. Hence, this action may be referred to as a "wiping" action and in this manner the complete removal of the leaves from the stalk is insured. Of course, there will be some impact to the leaves upon the initial engagement of the web therewith due to their rotational speed, but the overall leaf removing

function of the defoliating members is accomplished by a wiping action.

It has been found that with the use of the defoliating members of the present invention, leaf damage is reduced to a minimum. For example, tests of the present mechanism show that the total leaf damage both to the leaves within the swath and others above and below the same, is approximately 5.1%. These tests were conducted during the morning, which is the most advantageous time to harvest tobacco leaves as is well known in the art. The defoliating members were rotated at a preferred speed of approximately 425 R. P. M. and the propelling vehicle moved with a preferred ground speed of approximately 1½ M. P. H. Considering that any leaves within the swath which were not completely removed were counted as being 100% damaged, the 5.1% figure appears to be quite favorable. Of course, leaf damage varies in accordance with the position of the leaves on the stalk with respect to the direction of travel of the vehicle or the direction or extent of the tobacco row. The greatest damage occurs in those leaves that extend forwardly in the direction of travel within a 60° range. The least damage occurs in the leaves that extend generally rearwardly with the transversely extending leaves being damaged slightly less than average.

It thus will be seen that the objects of this invention have been fully and effectively accomplished. It will be realized, however, that the foregoing specific embodiment has been shown and described only for the purpose of illustrating the principles of this invention and is subject to extensive change without departure from such principles. Therefore, this invention includes all modifications encompassed within the spirit and scope of the following claims.

We claim:

1. A tobacco plant priming device comprising frame means movable along a row of tobacco plants, a pair of elongated defoliating members mounted on said frame means for rotation about horizontally spaced upwardly and forwardly inclined axes, each of said defoliating members including resilient web means disposed outwardly from its associated axis and extending substantially throughout the longitudinal extent of the associated member, and means operatively associated with said defoliating members for rapidly rotating the same in opposite directions during the movement of said frame means so that said web means will be deflected by the engagement of the tobacco stalks therewith to thereby contact the leaves adjacent their stalks and remove them with a downward wiping action.

2. A tobacco plant priming device for removing a vertical swath of leaves from a tobacco stalk comprising frame means movable along a row of tobacco plants, a pair of upwardly and forwardly inclined shafts journaled on said frame means in horizontally spaced relation, means operatively associated with said shafts for rapidly rotating the same in opposite directions, a pair of resilient defoliating members secured to said shafts for rotation therewith in opposite directions, said defoliating members being spaced apart horizontally so as to engage a row of tobacco plants on opposite sides thereof to thereby impart a downward wiping action to the leaves thereof adjacent their connections to the stalks, each of said defoliating members including a hub portion having a pair of oppositely directed webs extending radially outwardly therefrom, the hub portion of each of said members having a hollow interior for receiving the associated shaft and being fixed thereto with its webs disposed in helical arrangement about said shaft.

3. Apparatus for priming tobacco plants having stalks and leaves extending outwardly therefrom comprising frame means movable along a row of such tobacco plants, a pair of closely spaced means carried by said frame means for engaging the plants adjacent their stalks on opposite sides thereof as the frame means is moved there-

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along, at least one of said means comprising resilient web means having outer extremities movable in an endless path for delivering to substantially all of the leaves engaged thereby a downward wiping action adjacent the connection of the leaves with their stalks, and means operatively associated with said resilient web means for rapidly moving the latter in a generally downward path adjacent the stalks as said frame means is moved along the row of plants.

4. Apparatus for priming tobacco plants having stalks and leaves extending outwardly therefrom comprising a frame movable along a row of such tobacco plants, a pair of closely spaced means carried by said frame for engaging the plants adjacent their stalks on opposite sides thereof as the frame is moved therealong, at least one of said means comprising an elongated defoliating member mounted on said frame for rotation about an upwardly and forwardly inclined axis, said defoliating member including a pair of resilient tobacco plant engaging webs disposed in helical arrangement about said axis of rotation and operable, during the rotation of said defoliating member and the movement of said frame, to be deflected inwardly by the engagement of the tobacco stalks therewith so as to contact the leaves extending toward and generally parallel thereto and remove them with a downward wiping action, said webs being displaced circumferentially approximately 180° from each other and being otherwise substantially identical, and means operatively connected with said defoliating member for rapidly rotating the same.

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5. Apparatus for priming tobacco plants having stalks and leaves extending outwardly therefrom, a frame movable along a row of such tobacco plants, a pair of closely spaced means carried by said frame for engaging the plants adjacent their stalks on opposite sides thereof as the frame is moved therealong, at least one of said means comprising an elongated defoliating member mounted on said frame for rotation about an upwardly and forwardly inclined axis, said defoliating member including resilient web means disposed outwardly from said axis and extending substantially throughout the longitudinal extent of said member, and means operatively associated with said defoliating member for rapidly rotating the same during the movement of said frame whereby said web means is moved into engagement with the plant and is operable to be deflected by the engagement of the stalks thereof so as to permit engagement of the leaves extending toward and generally parallel thereto adjacent their connection with the stalks and effect removal with a downward wiping action.

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