

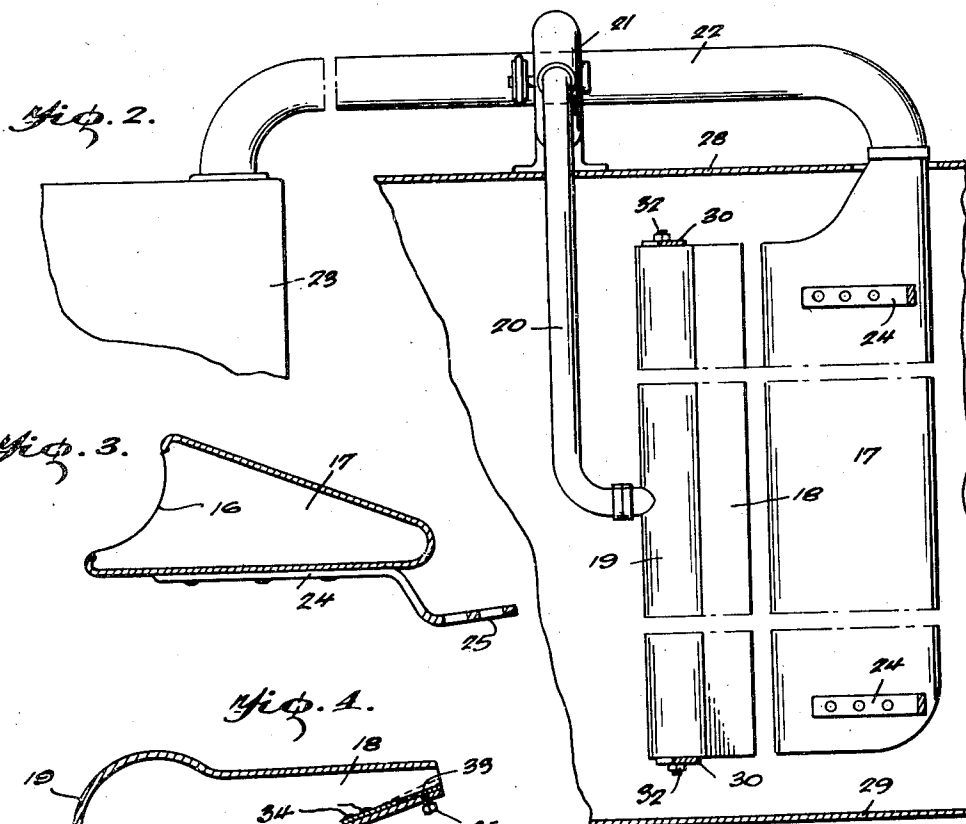
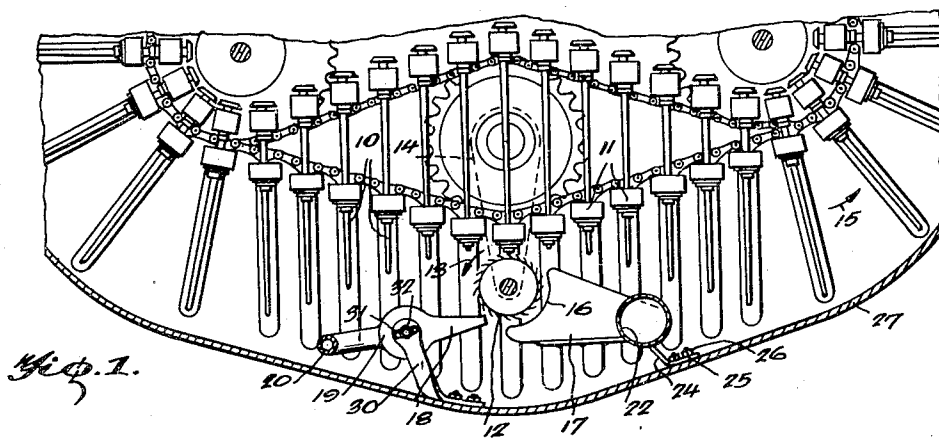
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DOFFING MECHANISM FOR COTTON HARVESTERS

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DOFFING MECHANISM FOR COTTON HARVESTERS

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The present invention relates particularly to the cotton doffing mechanisms, as used in cotton harvesting or picking machines, for the doffing or removal of lint cotton from the cotton picking elements or instrumentalities, for instance the cotton picking spindles of what are commonly known as spindle machines, and are included in many patents, examples being my own Patents Numbers 2,224,285 and 2,224,286, both granted December 10, 1940, and entitled "Cotton Pickers."

In such machines it has long since been the custom, as evidenced in my above patents, to utilize rapidly rotating spindles which are projected through the leafy cotton plants to seek the cotton of the bolls. Upon contact with only a wisp of such cotton, the rapidly rotating spindles are effective to wrap the fiber, with its embedded seeds, around the same, and in so doing to jerk the cotton fiber free of the husk of the boll. The fiber, so gathered by the spindles, is then stripped lengthwise of the spindles to their free ends, and the fiber or lint cotton is removed from the spindle ends by what is known as a doffing mechanism.

As exemplified in my above patents, the usual or conventional doffing mechanism consists of a doffing drum or cylinder, which may be in the nature of a carding cylinder, having peripherally outstanding carding pins, mounted to rotate in such proximity to the spindle ends, at the stripping station, as to catch and remove the lint cotton from the spindles. A more rapidly rotating brush cylinder usually brushes the lint cotton from the carding pins at another point of the carding cylinder, in the immediate proximity of the suction mouth of a suction cotton receiver. From this receiver a lint transfer pipe or flue leads to the suction side of a blower or fan which creates the suction necessary to draw the cotton from the brush cylinder into the receiver. The blast side of the blower or fan connects with a second lint transfer pipe or flue through which the lint is discharged, by the blast, into bags or a storage bin or the like on the picking machine.

The above means for doffing the cotton has been found lacking in desirability from several standpoints, among which may be mentioned the presence of the brush cylinder, since it is subject to rapid wear and needs frequent replacement for maximum efficiency.

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From another standpoint, and bearing in mind the value of the cotton seed, it has been found that seeds are frequently cracked by reason of their necessary passage through the blower or fan. This not only lowers the value of the seed but is a detriment in the subsequent ginning of the cotton.

It has also been noted, as a great disadvantage, that in the presence of any obstruction in the cotton transfer pipes or flues, the suction mouth or receiver is subject to a decided drop in pressure, seriously interfering with its normal, continuous efficiency.

In the light of the above, the present invention therefore proposes a doffing mechanism, the primary objects of which may be said to include:

1. An arrangement in which movement of lint cotton through a fan or blower is eliminated, and cracking of cotton seed is avoided.

2. An arrangement including less than the usual number of parts, and especially eliminating the conventional brush cylinder, and,

3. An arrangement adaptable to the use of a constant pressure blower and the elimination of pressure drops in the receiver and the lint transfer pipes or flues.

With the foregoing in mind, further and more specific objects of the invention, as well as its features of construction, operation and advantages, may be better understood and more thoroughly appreciated in the course of the following description in detail thereof, and by reference to the accompanying drawing, disclosing the best mode so far devised for carrying the invention into practical effect.

In the drawing, which forms a part of this specification,

Figure 1 is a plan view, partly in horizontal section, illustrating the practical application of the invention.

Figure 2 is a side elevation illustrating parts of the invention, certain thereof being in section.

Figure 3 is a detail horizontal section, enlarged, through the cotton receiver, and,

Figure 4 is a similar view taken through the nozzle and its header.

Referring now to Figure 1, the doffing mechanism of the present invention is shown, for purposes of illustration, as positioned at the doffing station of a cotton picking machine of the type

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described and claimed in my above mentioned patents, at which station the picking spindles 10 have been withdrawn in the direction of their lengths, in the operation of the picking mechanism, through the stripper bars 11, so that cotton, wrapped around the spindles, is forced to the extremities thereof. At this doffing station, a vertically disposed, rotating doffing drum 12 is positioned so that it will remove, from the ends of the spindles 10, the cotton thus stripped to these points by the stripper bars 11.

The doffing drum 12 is shown in the form of a carding cylinder, with peripherally outstanding pins angled or inclined therefrom in the direction of its rotation. An arrow 13 indicates the direction of rotation of cylinder 12, which is effected by any suitable driving connections with a rotating part of the picking mechanism.

For the above purpose a belt or chain 14 may be used, as seen in dotted lines in Figure 1. An arrow 15 indicates the direction of movement of the spindles 10 in their orbit around the machine and through the doffing station, but it is not intended by this illustration to limit the present invention with the particular type of picking machine thus shown.

Partially surrounding one side portion of the carding cylinder 12, and extending vertically therealong, is the enlarged open side or mouth 16 of a laterally tapering lint receiver 17, and disposed toward said open mouth 16, at the opposite side of, and tangentially with respect to, said cylinder 12, is a blast nozzle 18 carried by, and vertically along, a header 19.

Communicating with the header 19 is a blast pipe 20 which may be, in whole or in part, flexible, and which leads from a pressure blower 21, preferably of a constant pressure type, so that a blast of air will continuously operate against the cylinder 12, tangentially thereof in the direction of the inclination of its pins, to remove lint therefrom and carry the same into the mouth 16 of the lint receiver 17. The cotton-laden blast will then pass from the receiver 17 through its communicating lint transfer pipe or flue 22, into a suitable lint storage receptacle.

As shown in Figure 2, the lint storage receptacle above referred to, may be a storage bin 23 carried by the cotton picker, but a bag on the discharge end of the pipe or flue 22 would answer the same purpose.

As seen in Figures 1, 2 and 3, the receiver 17 is shown as provided with brackets 24 having offset, slotted end portions 25 by which they may be adjustably anchored, as by means of bolts 26, to the adjacent side wall 27 of the casing of the picking mechanism. In this manner, adjustment of the mouth 16 of the receiver 17 toward and away from the periphery of the carding cylinder 12 is provided for. The said wall of the casing appears in Figure 1, and the top and bottom walls 28 and 29 thereof appear in Figure 2.

In somewhat similar manner, as seen in Figures 1 and 2, the nozzle 18 and its header 19 are supported at the upper and lower ends thereof by bracket arms 30. These arms are anchored on the side wall 27, and are slotted at 31 for the reception of clamping bolts 32 at the upper and lower ends of the header 19. Thus the nozzle may be readily adjusted both toward and away from the carding cylinder 12, and angularly with respect thereto.

It is also desirable to provide an adjustment for the discharge throat of the nozzle 18. To

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this end an adjusting strip 33 may, as seen in Figure 4, be secured along its inner edge portion, as by rivets 34 and the like, to the inner surface of one side wall of the nozzle, so that its free outer edge portion extends into the discharge throat and so that the strip will normally lie flatwise against the said wall. This strip 33 is formed of a flexible, elastic metal or similar material, adapting its free outer edge portion to be adjusted toward the opposite wall of the nozzle to thus reduce the normal or full width of the discharge throat.

Yielding adjustment of the strip 33, for the above mentioned purposes, may be accomplished in many ways. It is suggested in Figure 4 that such adjustment may be accomplished by set screws 35 threaded through the adjacent side wall of the nozzle.

The specific arrangements permitting the foregoing adjustments of the lint cotton receiver 17 and the nozzle 18, with respect to the carding cylinder 12 may, of course, be varied, the arrangements disclosed being but examples suggested in the interests of simplicity and economy. This is also true of the adjusting means as shown and described for controlling the effective area of the discharge throat of the nozzle 18.

In operation, the rapidly rotating carding cylinder 12 takes cotton from the extremities of the spindles 10 of the picking machine at its doffing station where the spindles have been withdrawn for substantially their full lengths through the respective stripper bars 11. The blast from the nozzle 18, acting against the carding cylinder 12, removes the lint cotton therefrom and forces the cotton into the receiver 17, and from this receiver, directly through lint transfer pipe or flue 22, to the lint storage receptacle 23.

Since the nozzle-directed blast may be of constant pressure, there is no danger of drop of pressure, at any time, at the receiver, and since the removed lint is forced directly to storage through pipe or flue 22 and does not pass through a fan or blower, the danger of cracking the seeds, embedded in the lint, is eliminated.

In other respects the doffing mechanism as herein disclosed is greatly superior to the mechanism now commonly used for this purpose, if but elimination of the usual brush cylinder, and reduction of the number of parts in this manner, is considered.

Having thus fully disclosed the invention, what is claimed is:

1. In a cotton picker, doffing mechanism comprising: supporting structure; a doffing element rotatably carried by the supporting structure and having a generally circular periphery for engaging and carrying cotton; a receiver at one side of and adjacent to the doffing element so that the doffing element rotates toward the receiver, said receiver being in the form of a hood having a mouth shaped to embrace a portion of the periphery of the doffing element; means mounting the receiver on the supporting structure for adjustment of the receiver toward and away from the doffing element to vary the embracing relationship between said receiver and said doffing element; an air blast nozzle at the other side of the doffing element for directing a blast of air in a path generally tangent to the periphery of the doffing element and generally in the direction of rotation of said element and toward the receiver so that cotton is dislodged from the doffing element and directed into the

mouth of the receiver; and means mounting the nozzle on the supporting structure for adjustment of the nozzle toward and away from the doffing element generally along the path of air discharge therefrom.

2. The invention defined in claim 1, further characterized in that: the mounting means for the nozzle includes provision for angular adjustment of the nozzle about an axis spaced from and generally parallel to the axis of rotation of the doffing element.

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