

Oct. 20, 1931.

E. A. JOHNSTON ET AL

1,828,534

DOFFING MECHANISM FOR COTTON PICKERS

Filed Nov. 8, 1929

2 Sheets-Sheet 1

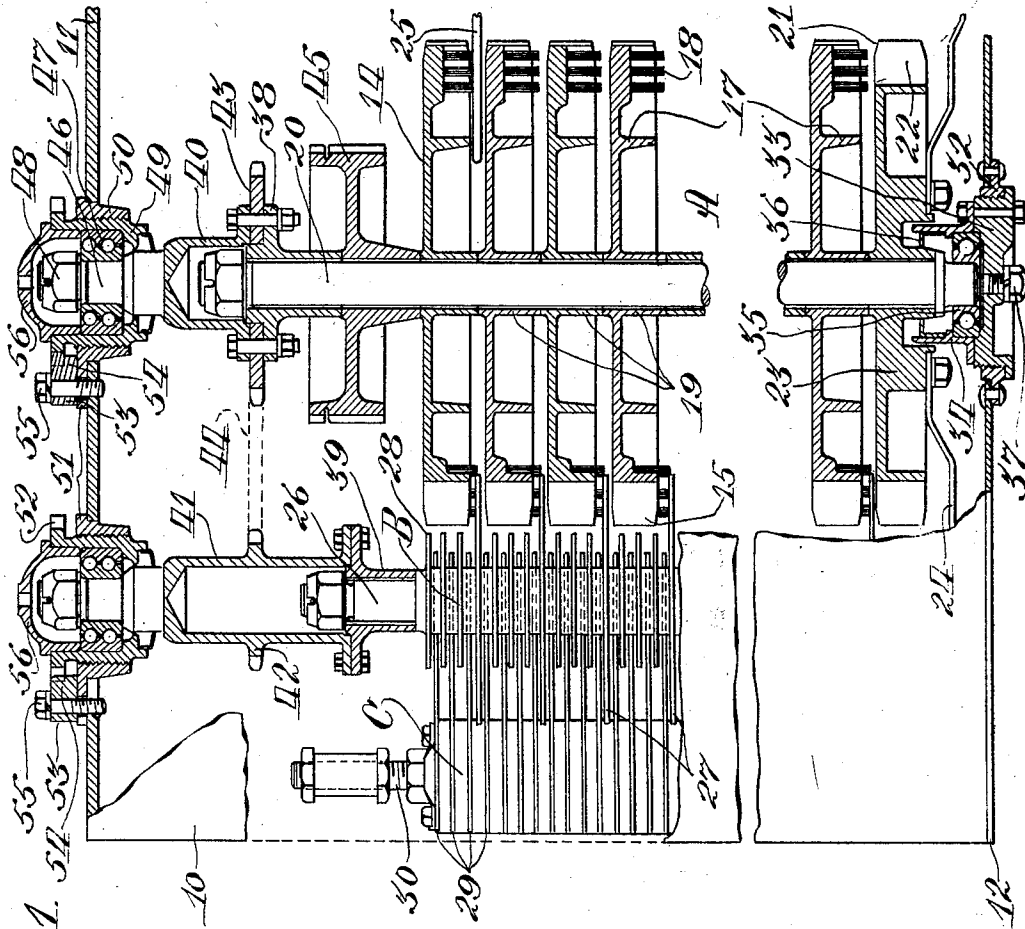


Fig. 1.

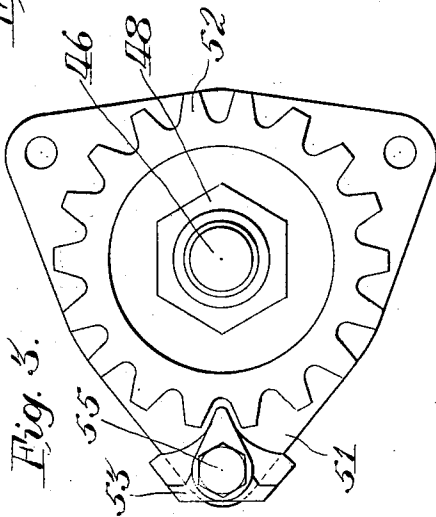
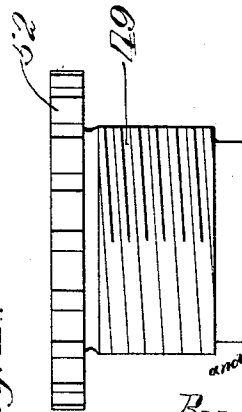


Fig. 3.

Fig. 4.



Inventors
E. A. Johnston
and D. B. Baker
By N. P. Desluis
Att'y.

UNITED STATES PATENT OFFICE

EDWARD A. JOHNSTON AND DAVID B. BAKER, OF CHICAGO, ILLINOIS, ASSIGNORS TO
INTERNATIONAL HARVESTER COMPANY, A CORPORATION OF NEW JERSEY

DOFFING MECHANISM FOR COTTON PICKERS

Application filed November 8, 1929. Serial No. 405,574.

The present invention relates to improvements in the doffing mechanism such as employed in cotton pickers in combination with picking mechanism of the spindle type.

The objects of the invention are to provide rotary doffer mechanism which will efficiently strip the picking spindles of adhering cotton and immediately thereafter freely deliver the stripped cotton for collection, and to provide in such mechanism means which will serve to effect and maintain accurate mechanical adjustment between cooperating elements of the doffer mechanism and between the doffing mechanism and the picking spindles.

In general, this is accomplished by causing the spindles to be subjected to the action of doffing elements of novel type, which in turn are acted on by means for removing cotton therefrom and by providing means for accurate adjustment of the doffing mechanism vertically to establish exact relation between the doffing spaces and the horizontal orbits in which the spindles travel.

The invention accordingly resides in the organization and details of construction, or equivalents thereof, hereinafter described and defined in the claims. On the accompanying drawings,—

Figure 1 is a side view of the doffing mechanism with the doffer proper and the supporting bearings in section;

Figure 2 is a top view showing the doffing mechanism and cooperating elements of the cotton picker;

Figure 3 is an enlarged plan view of the adjustment device for the upper bearing cages;

Figure 4 is a side view of an adjusting member seen in Figure 3; and,

Figures 5 and 6 are plan and side views, respectively, of a latch member forming part of the adjustment device of Figure 3.

In the present embodiment of the invention, the doffing mechanism is shown as mounted in a sheet metal housing 10, which also contains the picking mechanism, the housing being supported for transport along a plant row in the manner shown, for instance, in the patent to Johnston et al.

1,727,708, Sept. 10, 1929. The housing com-

prises upper and lower plates 11 and 12 in which are mounted the bearings for a vertical shaft carrying the picker cylinder shown in part at 13 (Figure 2) and also the bearings for the shafts of the cooperating doffer mechanisms now to be described.

The doffing mechanism as a whole comprises three associated units, seen in Figure 1, which may be regarded as consisting of a main doffing cylinder A acting directly on the picker spindles, a cleaning or stripping cylinder B acting on the doffer cylinder, and a comb unit C acting on the cleaning cylinder. The main doffing cylinder is composed of a bank of superposed disk-like members 14, all of which are of similar structure with the exception of the lower or bottom member. The members above the bottom one are formed with plane upper surfaces and with a stepped or toothed periphery, each step or tooth of which is formed with a forwardly presented, straight, outwardly extended edge 15 and a rear edge 16, which preferably inclines on a line joining the outer end of the tooth with the base of the straight edge of the next tooth. The lower surface of each doffer member is provided with a series of depending ribs or flanges 17, each extending from the outer end of a tooth flush with its straight edge 15 and then extending inwardly towards the center of the disk on a curved line, the convex side of which is presented in the direction of rotation of the doffer. One rib 17 is formed in connection with each tooth throughout the circumference of each doffer member, as illustrated in dotted lines on Figure 2 in connection with several of the teeth there shown. Parallel with the edge 15 of each tooth and immediately back of that part of the rib 17 which depends therefrom there are mounted brush tufts 18 which project a little beyond the edge of the rib, as best seen in Figure 1. Each doffer member is formed with a hub 19 splined on a supporting shaft 20 and the members forming the doffer cylinder are mounted with the ends of the hubs in contact, the hubs being of sufficient length to provide a spindle receiving zone or space between the upper surface of one doffer member and the lower ends of

the brushes 18 on the under surface of the next. The bottom member 21 of the doffer cylinder is without the brushes 18 and flanges 17, but is preferably provided with a continuous depending peripheral flange 22 and with a circular depending flange 23 adjacent its hub, to which is secured a downwardly inclined and radially extended trash expelling plate or disk 24, which extends beyond the circumference of the doffer cylinder, as seen on Figure 2, this trash expelling device forming the subject-matter of a copending application Serial No. 165,583, filed February 3, 1927.

The picker drum 13 carries vertically spaced sets of rotary spindles 25 which are positioned to be received in the interspaces of the doffer cylinder and these spindles are so mounted and actuated as to be moved in an orbital path and successively presented to the doffer cylinder on a line substantially tangential to the cylinder and in such manner that the brushes 18 will act on the spindles from base to tip under the combined movements of the picker drum and doffer cylinder, which rotate in the directions of the arrows on Figure 2.

The cleaning unit or cylinder B of the doffing mechanism comprises a vertical shaft 26 on which are splined a series of toothed cleaning disks 27, the teeth or extensions of which extend into the interspaces between the members of the doffing cylinder. The disks 27 are flat and spaced from one another a distance equal to the spindle receiving spaces of the doffing cylinder. Above and below each disk 27 the shaft 26 has splined thereon flat circular disks 28 which are of smaller diameter than the disks 27 and extend to points adjacent the periphery of the doffer members. Comparatively narrow spaces are left between the successive disks 27 and 28, and in each of these spaces there is positioned on the forward or inner side of the cleaning cylinder a comb tooth or arm 29. These arms 29 are curved, as shown on Figure 2, and are fixedly mounted in properly spaced relation on a vertical shaft 30 on the rear of the housing 10. The gang of arms 29 serve to comb the cotton from the disks of the cleaning cylinder B and to direct it to a conveyor or the like 31, which extends upwardly and rearwardly from the bottom of the housing and carries the cotton to suitable receivers, not shown. It is to be observed that the disks of the cleaning cylinder together with the comb unit form a wall or barrier, which prevents passage of cotton therethrough and forces its movement towards the conveyor 31, which is positioned to receive cotton discharged from the doffing and stripping cylinders by centrifugal force.

A further important feature of the invention resides in the manner of mounting the shafts 20 and 26, on which the doffing mem-

bers and cleaning disks are secured, so that these shafts may be adjusted axially to bring the spindles 25 and the disks 27 into accurate relation with the interspaces of the doffing cylinder. At their lower ends, both shafts 20 and 26 are mounted in bearings permitting some axial movement of the shaft journals. For example, the lower bearing for the doffer shaft 20 may comprise an annular screw threaded member 32 bolted to the bottom plate 12 of the housing, a bearing plate 33 threaded into the annular member 32, and a sleeve 34 bolted to the inner side of the plate 33. The sleeve 34 contains a roller cage 35 receiving the end of the shaft and a collar 36 closing the upper side of the bearing. A lubricant retaining plug 37 may be used to close a central opening in the plate 33.

At their upper ends, shafts 20 and 26 are each held by cap nuts in flanged sleeves 38 and 39, respectively, and these are secured to the lower flanged ends of supporting heads 40 and 41. The head 41 on shaft 26 is elongated and formed with a small sprocket 42 which is in the same horizontal plane with a larger sprocket 43 secured on shaft 20 between the flanges joining sleeve 38 on that shaft to its supporting head 40. The sprockets are connected by a sprocket chain indicated at 44, and the cleaner cylinder is accordingly driven from the doffer cylinder, but at higher speed. The doffer cylinder includes a gear wheel 45 splined thereon and actuated from a source of power not shown. The vertically adjustable shaft supporting bearings for shafts 20 and 26 are identical in structure and one description will serve for both. The bearing head of each shaft includes a vertical spindle 46 having a reduced journal portion seated in a roller bearing cage 47 in which it is held by a cap nut 48. The roller cage 47 is seated in an externally threaded supporting cage 49 which is in threaded engagement with a ring-shaped, complementary member 50 fixed in the upper plate 11 of the housing and having flanges 51 resting thereon. The supporting cage 49 is formed with an outwardly extending toothed flange 52, and this is adapted to interlock with a latch piece 53 seated on an angular portion of the flange 51 and held in position by means of lugs 54 engaging the edges of the flange 51 and by a set screw 55 threaded into the top plate of the housing. A flanged cap piece 56 closes the upper end of the supporting cage 49.

With the bearing support described, disengagement of the latch 53 from the toothed flange 52 permits the bearing cage 49 to be turned to raise or lower it together with the shaft supported by it, after which the latch 53 can be replaced and the adjustment permanently held. This permits the doffer to be accurately adjusted with respect to the spindles 25, so that these will be properly

received in the interspaces and engaged by the brushes 38. Shaft 26 can then be similarly adjusted to properly set the cleaning disks 27. The units of the doffing mechanism can, therefore, be maintained in efficient working relation, and wear of the brushes or other parts compensated for by adjustment of the carrying shafts.

In operation, the doffing mechanism, after adjustment as above described, will subject the spindles to the stripping action of the doffer brushes, as illustrated by Figure 2. The cotton removed from the spindles will be received between the ribs 27 and much of it projected from the doffer members by centrifugal force towards the conveyor 31. The cotton adhering to the brushes will be dislodged by the rapidly revolving cleaning disks 27 and thrown towards the conveyor, the fingers 29 stripping any cotton tending to remain on the disks.

The structure described presents a preferred embodiment of the invention, but modifications are obviously possible without departure from the scope of the invention as defined in the following claims.

What is claimed is:

1. A doffer for cotton pickers of the spindle type, comprising an upright shaft, superposed disks on the shaft spaced apart to admit passage of spindles therebetween, each disk having one side formed as a plain surface and its other side provided with a circumferential series of arcuate ribs extending outwardly from the central portion of the disk, and means adjacent the outer end of each rib for dislodging cotton from moving spindles.

2. A doffer for cotton pickers of the spindle type, comprising an upright shaft, superposed disks on the shaft spaced apart to admit passage of spindles therebetween, the lower disk having a plain upper surface and the disk above being provided with outwardly extending circumferentially disposed spaced ribs depending from its lower surface, and brush tufts on the under surface of said disk adjacent the outer ends of said ribs.

3. A doffer for cotton pickers of the spindle type, comprising an upright rotatable shaft, superposed spaced disks fixed on the shaft for rotation therewith and having toothed peripheries, each tooth having a straight outwardly extending edge presented in the direction of rotation of the disks, a depending rib formed on the margin of said edge of each tooth, and brush tufts mounted behind said ribs with the ends thereof projecting beyond the edges of the ribs.

4. A doffer for cotton pickers of the spindle type, comprising an upright shaft, superposed disks on the shaft spaced apart to admit passage of spindles therebetween, the lower disk having a plain upper surface and the disk above being provided on its under surface with a circumferential series of arcu-

ate ribs extending outwardly from the central portion of the disk and terminating in straight portions adjacent its periphery, and brush tufts extending from the under surface of said disk adjacent the straight portions of the ribs.

5. In doffing mechanism for cotton pickers of the spindle type, the combination of a casing having upper and lower plates, means in the casing for supporting and moving ranks of picker spindles in horizontal orbits, doffing means for clearing said spindles and discharging cotton collected therefrom comprising an upright shaft, superposed doffer disks mounted on the shaft and spaced to receive the spindles therebetween, a second shaft parallel thereto and carrying stripping disks extending within the spaces between the doffer disks, bearings in the upper and lower plates of the casing receiving the ends of the respective shafts, and means for adjusting the upper bearings of both shafts vertically to effect axial adjustment of the shafts.

6. In doffing mechanism for cotton pickers of the spindle type, the combination of a casing having upper and lower plates, means in the casing for supporting and moving ranks of picker spindles in horizontal orbits, doffing means for clearing said spindles comprising an upright shaft, superposed doffer disks mounted on the shaft and spaced to receive the spindles therebetween, bearings in the upper and lower plates of the casing for receiving the opposite ends of the shaft, and means for adjusting one of the bearings vertically to effect axial adjustment of the upright shaft.

In testimony whereof we affix our signatures.

EDWARD A. JOHNSTON.
DAVID B. BAKER.

105

110

115

120

125

130