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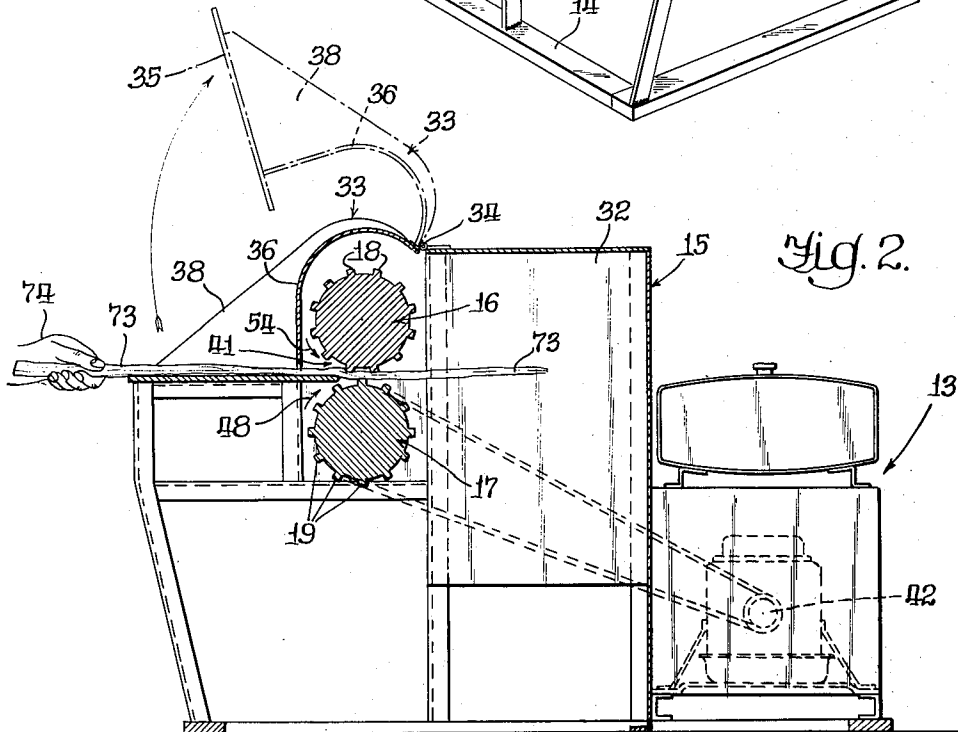
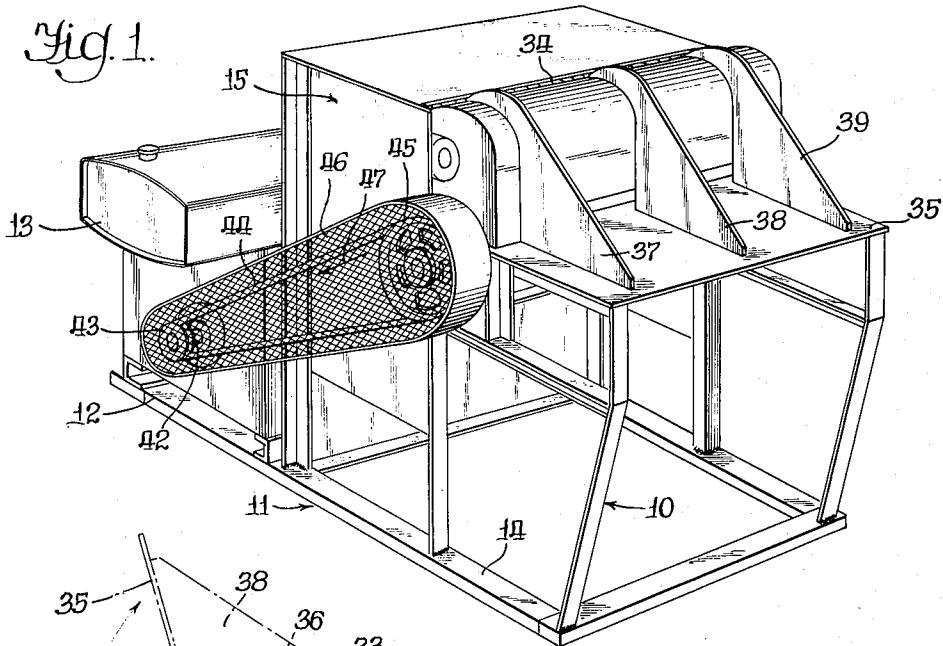
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FIBRE DECORTICATING MACHINE

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Fig. 1.



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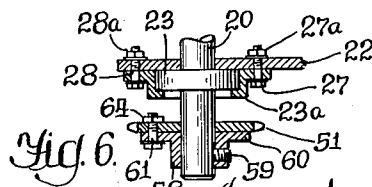
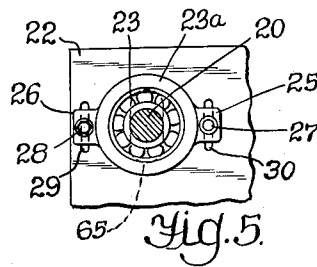
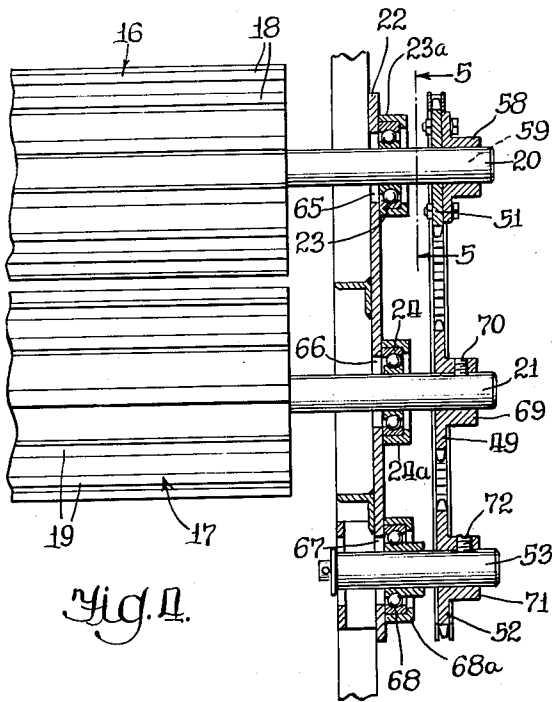
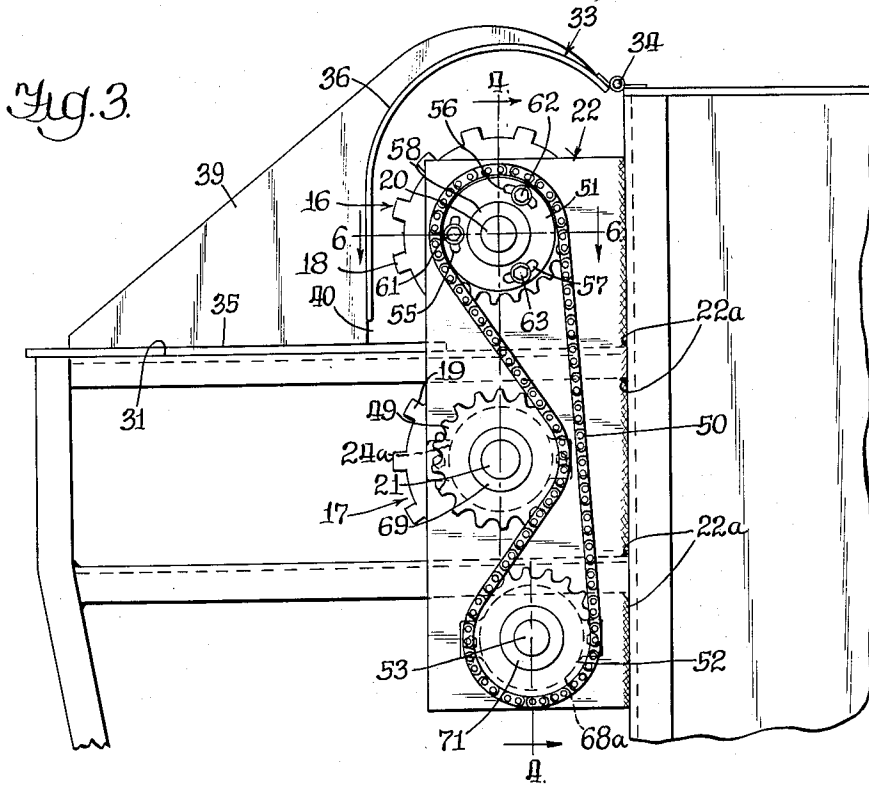
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FIBRE DECORTICATING MACHINE

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1 Claim. (Cl. 19—24)

This invention relates to a new and improved fibre decorticator of the type employing a hand feed of fibre stalks thereto and a hand retraction of the stalks to effect decortication.

A principal object of this invention is to provide a decorticator wherein fibre stalks are hand gripped and inserted into the machine for simultaneous scutching action on opposite surfaces thereof when the stalks are pulled out of the machine.

An important object of this invention is the provision of a decorticator wherein fibre stalks are hand gripped and inserted into the machine for simultaneous scutching action on opposite surfaces thereof when the stalks are pulled out of the machine.

Another important object of this invention is to supply spaced cooperative ribbed rolls in a decorticator machine in such a manner that the ribs of the opposing rolls are alternately spaced with respect to each other and act as anvils and scrapers to effect a complete cleaning of fibre stalks when the stalks are pulled out of the machine from between the rolls.

A still further important object of this invention is to provide a decorticator wherein fibre stalks are hand gripped at one end and fed between cooperative ribbed rolls to accomplish a breaking and crushing of the stalks, and thereafter the stalks are immediately pulled out from between the ribbed rolls to accomplish a complete cleaning of all pulp from the stalks.

Another and still further important object of this invention is the provision of a hand fed decorticator with vertically spaced cooperative ribbed rolls and a feed shelf for guiding fibre stalks into and out of said cooperative rolls.

Still another object is the supplying of a hinged cover over cooperative scutching rolls to act in three ways—as a shield for the moving parts of the machine, as a clean-out opening door, and as a guide for stalks into the machine.

Other and further important objects and advantages will become apparent from the disclosures in the following specification and accompanying drawings.

In the drawings:

Fig. 1 is a perspective view of the fibre decorticator of this invention.

Fig. 2 is a longitudinal sectional view taken through the machine as shown in Fig. 1.

Fig. 3 is an enlarged partial side view of the decorticator.

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

Fig. 5 is a detail view taken on the line 5—5 of Fig. 4.

Fig. 6 is a sectional view taken on the line 6—6 of Fig. 3.

As shown in the drawings:

The reference numeral 10 indicates generally a frame structure having a base 11. A rear portion 12 of the base 11 carries an engine 13 preferably of the internal combustion type. A front portion 14 of the base 11 carries a decorticator housing 15.

Within the housing 15 are cooperative decorticator rolls. These rolls are vertically positioned one above the

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other with the upper roll identified by numeral 16 and the lower roll by numeral 17. These rolls by reason of their radially projecting spaced ribs 18 and 19 on the rolls 16 and 17, respectively, effect decortication of fibre stalks which are fed therethrough. The ribs 18 on the roll 16 and the ribs 19 on the roll 17 are timed with respect to each other so that they are intercalated with one another.

The roll 16 is carried on a shaft 20 and the roll 17 is carried on a shaft 21 as best shown in Fig. 4. These shafts 20 and 21 are journaled within the frame structure 10 in a manner to be hereafter described. A roll carrying plate 22 is mounted on the side of the housing 15 and constitutes a reinforcement therefor. The plate 22 is welded at several points 22a to the housing 15 and frame structure 10. A ball bearing 23 is mounted on the plate 22 through an intermediate bearing housing 23a and constitutes the end support for the upper roll shaft 20. The lower roll shaft 21 is journaled within a ball bearing 24 which in turn is supported in a housing 24a. Wing-like side extensions 25 and 26 extend laterally outwardly from the sides of the bearing housing 23a as best shown in Fig. 5. Bolts 27 and 28 pass through the wings 25 and 26 respectively and thence through elongated vertical notches 29 and 30 in the plate 22. Nuts 27a and 28a engage the bolts 27 and 28 respectively and hold the bearing 23 in any desired vertically adjusted position on the plate 22.

The top of the forward portion of the frame structure 10 is identified by the numeral 31. An intermediate chamber 32 is provided on the frame structure 10 within the housing 15. A shield means 33 is hinged at 34 on the housing 15. The shield means 33 includes a shelf or stalk guiding portion 35 which in the down position of the shield means 33 rests on the top 31 of the frame structure 10. The shield means also includes a roll shield 36 and laterally spaced apart reinforcing ribs 37, 38, and 39 which join the roll shield 36 with the stalk guiding shelf 35. These ribs also act to aid in guiding the stalks over the shelf 35. A fixed transverse opening 40 is disposed between the roll shield 36 and the shelf portion 35 to form a stalk feeding opening for delivery of stalks to the cooperative decorticator rolls 16 and 17. When the shield means 33 is in its down position on the top 31 of the frame structure 10, the opening is in horizontal alignment with the juncture 41 between the cooperative rolls 16 and 17.

The engine 13 is equipped with a drive shaft 42 on which is mounted a V-belt pulley 43. A V-belt 44 delivers rotational drive from the pulley 43 to a V-belt pulley 45 mounted on the lower roll shaft 21 on one side of the decorticator machine.

A screened safety guard 46 is provided over the belt drive consisting of the pulleys 43 and 45 and their adjoining V-belt 44. The arrow 47 indicates the direction of travel of the belt 44 when the engine 13 is in operation. The arrow 48 as shown in Fig. 2 indicates the direction of rotation of the lower roll 17 as it is driven by the V-belt 44.

On the far side of the decorticator machine as shown in Fig. 3, a sprocket 49 is carried on the shaft 21. This structure is additionally shown in Fig. 4 which is a sectional view taken through the driving and driven shafts of the rolls 16 and 17. A chain 50 engages the sprocket 49 and imparts drive to the upper roll 16 by reason of its engagement with a sprocket 51 mounted on the shaft 20 of the upper roll 16. An idler sprocket 52 is carried on a stub shaft 53 which is journally mounted in and on the plate member 22. An arrow 54 in Fig. 2 indicates the direction of rotation of the upper roll as being opposite to the direction of rotation of the lower roll so that stalks fed into the left hand side of the machine as viewed in

Fig. 2 will be pulled between the cooperative rolls 16 and 17.

Arcuate elongated notches 55, 56, and 57 are provided in the sprocket 51 as shown in Fig. 3. The sprocket 51 is also equipped with a separate hub member 58 which is anchored securely to the shaft 20 by reason of a set screw 59 so that the hub and shaft will have concurrent rotation. The hub is provided with an annular flange 60 which lies in abutting relationship with the sprocket 51 and through which bolts 61, 62, and 63 may pass for attaching the sprocket 51 to the hub 58 for accomplishing a drive means therebetween. The fastening bolts 61, 62, and 63 pass through the arcuate notches 55, 56, and 57 in the sprocket 51 and it is apparent therefore that the sprocket 51 may have relative angular adjustment with respect to the hub and its integral flange 60 for the purpose of adjusting the ribs 18 of the upper roll 16 so that they interengage with the ribs 19 of the lower roll 17 in such a manner that the spaced ribs of the upper and lower rolls will enter the juncture 41 between the rolls in an alternate manner. As best shown in the sectional detail view of Fig. 6, nut means 64 engage the rear of the bolts 61, 62, and 63 and securely hold the sprocket in any desired angular position with respect to the hub 58 and thus also to the shaft 20 which carries this upper roll 16.

As shown in Fig. 4, the plate 22 is provided with vertically spaced apart vertically elongated notches 65, 66, and 67 for adjustable movement therethrough of the roll shafts 20 and 21 and for the stub shaft 53. The stub shaft 53 is journaled in a ball bearing 68 which is equipped with a housing 68a for fastening of the bearing to the plate 22 over the elongated slot 67 for various vertical adjustments on the plate 22. This is similar to the mounting of bearings 23 and 24. It is thus obvious that the rolls 16 and 17 may have their vertical spacing adjusted merely by raising and/or lowering the respective bearing housings 23a, 24a, and 68a. In the event that it is desired to separate the rolls 16 and 17 either for the purpose of accommodating greater diameter fibre stalks to be decorticated or to separate the rolls sufficiently so that grain may be threshed by the intercalated ribs 18 and 19, the upper roll shaft bearing 23 is raised within the elongated vertical slot 65 and the lock nuts 27a and 28a are retightened in the newly adjusted position of the bearing housing 23a. Thereafter, without moving the lower roll 17 or its respective bearing 24 it is only necessary to adjust the stub idler shaft 53 and its supporting bearing 68 in the same degree as the bearing 23 to insure the constant length chain 50 of having sufficient tautness to effect a proper drive.

The sprocket 49 is provided with an integral hub 69 which is fastened to the shaft 21 by means of a set screw 70. Similarly the sprocket 52 is equipped with a hub 71 which is fastened to the stub shaft 53 by a set screw 72.

In the operation of the decorticator of this invention, fibrous stalks 73, such as ramie, Chinese grass, etc., are gripped by a user's hands 74 for delivery into the decorticator to effect a removal of pulp from the stalks. Decortication of fibrous stalks means the removal of undesirable pulp from the useful fibres within the stalk. The stalks are cut in the field and brought to the decorticating machine of this invention, at which time the operator firmly grips the ends of a plurality of stalks, lays them on the shelf 35 and pushes the free ends of the stalks through the transverse opening 40 in the lower portion of the roll shield 36 whereupon the stalks enter the juncture 41 between the cooperative rolls 16 and 17. The direction of rotation of the rolls, as indicated by the arrows 48 and 54, causes the stalks to be pulled in by the interengaging ribs 18 and 19. This movement of the stalks through the rolls in a forward moving direction and with the direction of travel of the rolls causes a breaking and crushing of the stalks conducive to immediate decortication

thereafter when the stalks are pulled out of the machine. It should be understood that the ribs of each roll are of sufficient height to enter the space between the ribs of the adjacent roll thus causing stalk pinching for the breaking and crushing action. Immediately upon the stalks being pulled fully through the rolls 16 and 17 up to the limit of the operator's hands holding the ends thereof and as determined by the roll shield 36, the stalks are then withdrawn without any delay by the operator pulling the stalks out from between the rolls. This causes a simultaneous scutching or decortication of both the upper and lower surfaces of the stalks and the pulp of the stalks is thrown downwardly to the floor beneath the cooperative rolls. Decortication does not occur as the stalks are pulled into the machine, but rather decortication occurs when the stalks are pulled against the normal inward pulling of the stalks by the rolls. At this time the ribs 18 and 19 act alternately as anvils and scrapers to effect thorough decortication and quick separation of the undesirable pulp from the usable fibres. The alternating anvils and scrapers have constantly changing clearances occasioned by the rotation of the rolls and thus there is a vibration imparted to the stalks which contributes materially to the successful separation of pulp from fibres. Any prolonged or continued delay of the stalks in a position between the scutching rolls 16 and 17 would damage the fibres and it is thus important to immediately withdraw the stalks from the rolls after they have traveled to their innermost ends. The operator then turns the stalks around holding the ends already decorticated and inserting the ends, previously held in his hands, into the machine in the same manner just described. It is thus apparent that the full length of the fibrous stalks may be decorticated in this machine merely by turning the stalks around and treating the other ends thereof.

If it is desired to work with larger diameter fibre stalks or to thresh grain, it might be necessary to change the vertical spacing of the cooperative rolls 16 and 17 and this may be accomplished as previously described by shifting the bearings 23, 24, and/or 68 in their respective elongated slots 65, 66, and 67 in the plate 22. It should also be remembered that the timing of the ribs 18 and 19 on the respective decorticating rolls 16 and 17 may be adjusted by reason of the special sprocket 51 with its angular adjusting means as shown in Figs. 3 and 6. The vertical adjustment of this upper roll bearing may be compensated for by a comparable adjustment of the idler sprocket bearing 68a and thus the chain 50 may be maintained taut and of a constant length throughout all the adjustable positions of roll spacing. Bearings at the other ends of roll shafts 20 and 21 are also provided with means (not shown) similar to the bearings 23 and 24 and their respective housings to make them vertically adjustable so that the rolls might be positioned in parallelism one with the other.

The two rollers 16 and 17 are used alternately with one as a beater or scraper and the other as a moving anvil. This provides a varying gap between the beater and anvil. Also, the anvil and beater operate at approximately the same speed, thus pulling on both sides of the fibre at the same time keeping the fibres straight and having no tendency of rubbing the fibre with relation to each other. The decorticating machine of this invention is a very efficient device for the simultaneous scutching and removal of pulp from opposite sides of fibrous stalks as they are inserted and removed by an operator. The device is simple in construction, simple to operate and yet performs the very desirable decorticating function of removing the undesirable pulp from the desirable fibres in a stalk. Further, the device is easily serviced and/or cleaned by swinging the shield means upwardly about its hinge means 34 such as shown in the dashed line position of Fig. 2.

Numerous details of construction may be varied throughout a wide range without departing from the

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principles disclosed herein and we, therefore, do not propose limiting the patent granted hereon otherwise than as necessitated by the appended claim.

What is claimed is:

A fibre decorticating machine for cleaning both sides of fibre stalks comprising a frame structure, vertically spaced and aligned cooperative rolls journaled in said frame structure on horizontal axes, transversely disposed radial ribs on said rolls spaced at regular intervals around the circumference of each of said rolls, the ribs of one of said rolls arranged and timed for alternate disposition with the ribs of the other of said rolls, means rotatably driving said rolls in opposite directions, means guiding delivery of stalks to said cooperative rolls on the side thereof where the adjoining faces of the rolls are moving toward each other whereby the fibre stalks may be held at one end and inserted and drawn between the rolls and thereafter pulled out to complete decortication, said means guiding delivery of stalks to the rolls including a substantially horizontally disposed shelf carried by said frame structure in alignment with the juncture between

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the vertically spaced rolls, a shield forming a part of said shelf mounted on said frame structure and disposed over the top of said upper roll and extending down to a spaced position above said shelf, a plurality of laterally spaced apart ribs joining the shield and the shelf, said shield, ribs and shelf forming a unitary structure, and means hinging said unitary structure with respect to said frame structure.

References Cited in the file of this patent

UNITED STATES PATENTS

| | | |
|-----------|-------------------|----------------|
| 404,756 | Ward ----- | June 4, 1889 |
| 1,584,586 | Wright ----- | May 11, 1926 |
| 1,599,239 | Knox ----- | Sept. 7, 1926 |
| 2,108,578 | Brown ----- | Feb. 15, 1938 |
| 2,288,652 | Simons ----- | July 7, 1942 |
| 2,359,074 | Antonelli ----- | Sept. 26, 1944 |
| 2,373,411 | Pierrepoint ----- | Apr. 10, 1945 |
| 2,375,287 | Dempsey ----- | May 18, 1945 |
| 2,460,448 | Cook ----- | Feb. 1, 1949 |