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R. C. FERGASON
CORN HARVESTER HUSKING ROLL
WITH RESILIENT SECTION
Filed April 7, 1945

2,469,687

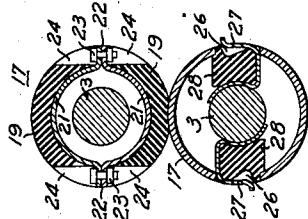
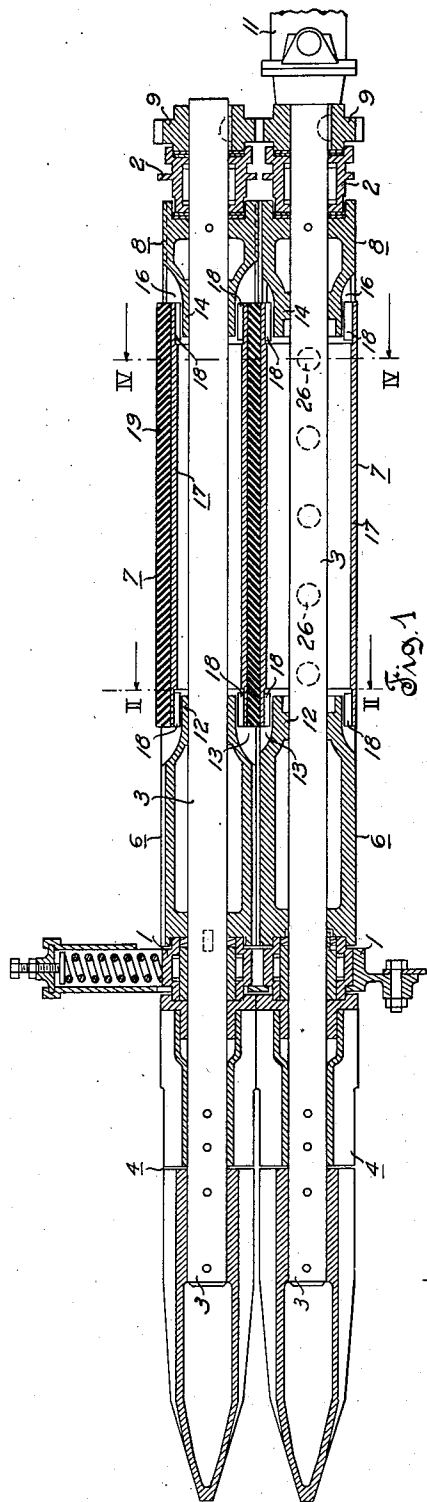


Fig. 4

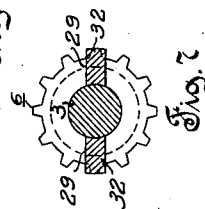


Fig. 7

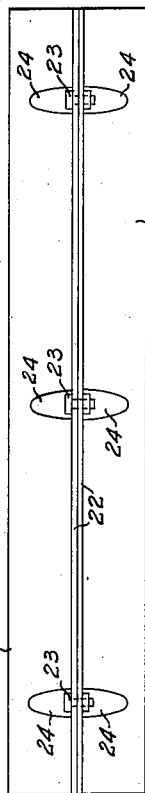


Fig. 5

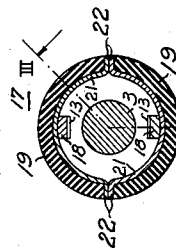


Fig. 2

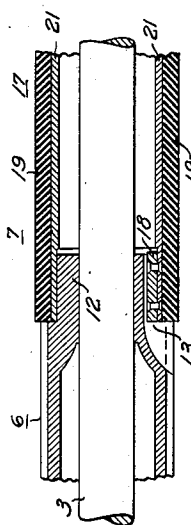


Fig. 3

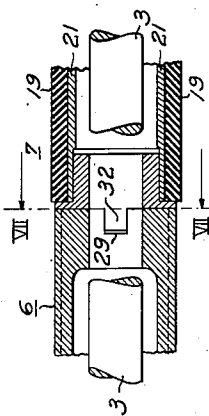


Fig. 6

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UNITED STATES PATENT OFFICE

2,469,687

CORN HARVESTER HUSKING ROLL WITH
RESILIENT SECTION

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14 Claims. (Cl. 130-5)

1

This invention relates generally to corn harvesters of the type utilizing a pair of opposed, oppositely rotating rolls for removing the husks from ears of corn passing thereover and more particularly to the construction of such rolls.

Most rolls of this type are of hollow construction and each roll or section usually includes a shaft member, a pair of front and rear parts which surround and are removably secured to longitudinally spaced portions of the shaft member by means of pins, keys or the like, and a surrounding tube having its opposite ends telescopically engaging and fixedly secured to the front and rear parts (hereinafter called end parts) in any suitable manner, such as by pins, welds or the like, to thereby provide a rigid construction. And one of the rolls may be provided with means presenting husk engaging elements which project outwardly from its external surface and are adapted to recede to a position flush with such surface upon contact with the external surface of the opposed roll, whereas the external surface of the opposed or other roll is preferably provided with a resilient covering of rubber or other material (hereinafter called rubber) suitable to increase its husk-gripping action.

In operation, unhusked ears are delivered to an end portion of a pair of such rolls and are moved longitudinally along same usually with the aid or coaction of a conveying chain or other means having ear engaging parts thereon, and as the ears move along the rolls, the husks are pulled from the ears by the action of the husking elements and the opposed surfaces of the rolls and pass downwardly between same. In this connection, a considerable portion of any trash delivered to the rolls along with the unhusked ears, for example, pieces of stalks, loose husks, weeds and the like, may also pass downwardly between the rolls before reaching the discharge end of same. The quantity of husks and other material passing between the rolls is often enough to urge the rolls apart with sufficient force to cause intermediate portions of the rolls, i. e., intermediate portions of the tube parts thereof, to flex or bow outward relative to each other, and as a result, the welds or other fixed connections between the ends of the tubes and the end parts supporting same on the shaft member frequently fail due to a repeated over-stressing of such connections. Consequently, the rolls frequently have to be disassembled and repaired or replaced which is a relatively costly and time consuming procedure, as it is usually necessary to replace both the tube and the end parts support-

2

ing same. Moreover, the same time consuming and costly procedure must be followed whenever the rubber covered tube part of a roll becomes worn or damaged sufficiently to warrant changing same.

And it is therefore an object of this invention to improve the construction of corn harvester husking rolls in a manner rendering same more durable and relatively inexpensive to manufacture and replace.

Another object of this invention is to provide an improved fabricated construction for corn harvester husking rolls which permits the tube part of the roll to be removed and replaced without replacing the tube supporting parts thereof.

Another object of this invention is to provide an improved construction for corn harvester husking rolls which permits the tube part of the roll to flex or bend relative to the tube supporting parts thereof without over-stressing the connections between such parts.

Another object of this invention is to provide an improved construction for corn harvester husking rolls which affords radially rigid supports for the ends of the tube part of a roll and which permits the ends of the tube part to move longitudinally relative to the parts supporting the ends of same as the tube flexes laterally relative to its longitudinal axis.

Another object of this invention is to provide an improved construction for corn harvester husking rolls which facilitates the manufacture and mounting of a rubber covered tube part thereof.

Still another object of this invention is to provide a sectional construction for the rubber covered tube part of a corn harvester husking roll which will permit the sections of such part to be readily installed, and when once installed, to be readily removed and replaced with a minimum of time, effort and skill.

The construction, application and advantages of husking rolls or husking roll sections embodying the invention will become readily apparent as the disclosure progresses and particularly points out additional features and advantages deemed of special importance. And accordingly the invention may be considered as consisting of the various details of construction, combinations of elements and arrangements of parts as is more fully set forth in the appended claims and in the detailed description, reference being had to the accompanying drawing, in which:

Fig. 1 is a longitudinal horizontal section

3

through a pair of corn harvester rolls embodying the invention;

Fig. 2 is a section taken on line II—II of Fig. 1;

Fig. 3 is a section taken on line III—III of Fig. 2;

Fig. 4 is a section taken on line IV—IV of Fig. 1;

Fig. 5 is a side elevation of the rubber covered tube;

Fig. 6 is a view similar to Fig. 3 showing a modified construction; and

Fig. 7 is a view taken on line VII—VII of Fig. 6.

Referring particularly to Fig. 1, it is seen that the invention may be applied to a pair of corn harvester husking rolls rotatably supported in coaxing side-by-side relation by longitudinally spaced front and rear pairs of bearing structures 1 and 2, respectively, and that each roll may include an inner shaft member 3 to which is removably secured a forward ear-snapping section 4, an intermediate trash-removing section 6, a rear husk-removing section 7, and a rear trash-removing part 8. The rear end portions of the inner shaft members 3 are drivingly connected by meshed gears 9 and the end of one shaft member is provided with a suitable coupling 11 for connecting same with a power shaft or source (not shown). In this connection, a pair of rolls such as herein described is adapted to be utilized in a corn harvester of the type disclosed in U. S. patent, C. J. Scranton, 2,340,084, to which reference may be had for additional information as to the general arrangement and coaction of parts.

The rear end of each trash section 6 terminates in a cylindrical portion 12 of reduced diameter provided with a pair of longitudinally extending, diametrically opposed grooves, keyways, splines or the like 13 (see Figs. 2 and 3), and the forward end of rear trash section 8 also terminates in a cylindrical portion 14 of reduced diameter provided with longitudinally extending grooves, keyways, splines or the like 16 similar in shape, number and arrangement to the grooves 13 in the opposed reduced end portion of trash section 6. The trash sections 6 and 8 are secured to the inner shaft member 3 with their grooves 13 and 16 disposed in substantial longitudinal alinement.

In this embodiment of the invention, the husking section 7 comprises front and rear parts (the rear portion of trash section 6 and the front portion of trash section 8, respectively), a relatively thin tube 17 surrounding the portion of shaft member 3 included between trash sections 6 and 8 and having its opposite end portions telescopingly surrounding and radially rigidly supported by the cylindrical end-ports of the front and rear parts, and a pair of internal projections, keys, or the like 18, which may be riveted or otherwise secured to or formed on each end of the tube, are slidably disposed in the diametrically opposed grooves 13 and 16 of the front and rear parts, i. e., the rear and front portions 12 and 14 of trash sections 6 and 8, respectively. And it should now be obvious that the connection between the ends of the tube and the front and rear supporting parts or elements prevents an angular movement of the tube relative to such parts and permits the ends of the tube to move longitudinally relative to the parts supporting same as the tube flexes laterally relative to its longitudinal axis. Moreover, if the tube should become worn or damaged sufficiently to warrant replacing same, only the tube part need be replaced, and all that has to be done, in order

4

to remove the tube part from the shaft member, is to remove only those other parts which are secured on the shaft member outwardly of either the front or rear tube supporting part, and to then remove the appropriate tube supporting part and slide the tube longitudinally of the shaft member.

Referring also to Figs. 4 and 5, it is seen that one of the tubes is covered with a relatively thick layer of rubber 19 and is formed of separable, interchangeable arcuate sections 21 having outwardly flanged longitudinal edges or edge portions 22 detachably united in abutting relation by means of bolts or the like 23. The bolts may be readily inserted and removed through aligned, flange exposing holes or recesses 24 formed in the layer of rubber 19 which is preferably of a thickness approximately equal to the width of the flanged portions 22. The other tube section is of nonsectional, uncovered construction and is provided with a longitudinal series of pairs of opposed holes 26 and with spring husking pegs 27 which project through the holes 26 and are held in place by rubber plug-like members 28 operative to permit the pegs to recede within the holes 26 when engaged by the surface of the opposed roll. The construction and mounting of the husking pegs forms no part of this invention and if more detailed information is desired concerning this feature, reference may be had to the disclosure of C. J. Scranton's Patent Number 2,391,846, filed November 6, 1943.

The ends of the sectional tube are supported on and connected with the cylindrical end portions of the front and rear tube-supporting parts in exactly the same manner as the uncovered roll, i. e., as hereinbefore described, the only difference being in the external diameter of the cylindrical portions of the front and rear tube-supporting parts which in this case differ an amount nearly equal to twice the thickness of the rubber layer 19 as is evident from a consideration of Fig. 4. And it should now also be obvious that in addition to preventing an overstressing of the connections between the ends of the tubes and the parts supporting same, the connections just referred to permit one or more of the rubber covered tube sections to be readily removed without disturbing the front and rear tube-supporting parts or any other parts of the roll assembly, simply by removing the readily accessible bolts 23.

Referring now to the modified construction shown in Figs. 6 and 7 in which like numerals are used to designate the same or corresponding parts, it is seen that the ends of tube 17 may be connected with front and rear parts or elements secured to shaft member 3 for rotation therewith by providing the plane annular end surface of each of such parts (the connections between the front and rear parts are identical and therefore only the connection between the front part, trash section 6, is shown) with a pair of diametrically aligned slots 29, and by providing each end of tube 17 with a radially flanged annular plug member 31 having an exterior end surface which is coextensive with and abuts the end surface of the opposed section or part and which presents a pair of diametrically aligned projections or ribs 32 slidably disposed within the slots 29. The plug members 31 may be inserted in the ends of an integral tube and secured therein by a pressed fit or otherwise to prevent an angular movement of the tube relative to the plug members, and if

the tube is formed of separable sections as indicated in Figs. 2, 4 and 5, the ends of the sections should be clamped around the plugs by the action of bolts 23 with sufficient force to prevent a relative angular movement of the tube and plugs either with or without the aid of interengaged projections (not shown).

Both of the constructions herein shown and described afford a relatively inexpensive, rugged construction in that no part of the husking roll assembly is secured to shaft member 3 at a point remote from the rear bearing structure therefor by a connection requiring a hole, keyway or other opening in or through the shaft which weakens same, and in that the ends of the tube parts of the husking roll are substantially free to move longitudinally relative to the front and rear shaft-carried, tube-supporting parts as the tubes flex laterally relative to their longitudinal axes. In this connection, it should be noted that in both constructions the ends of the tubes are carried by radially rigid supports (the reduced cylindrical end portions of trash sections 6 and 8 or the corresponding portions of plugs 31) and that therefore the loading of the projections 18 and 32 of tube parts 17 is primarily due to the driving connection afforded by such projections.

The invention is generally applicable to all types of corn harvester husking rolls irrespective of whether the tube parts thereof are connected with and/or supported by spaced, end-opposed portions of trash sections such as 6 and 8 or other suitable parts secured to a shaft member for rotation therewith, and it should therefore be understood that it is not desired to limit the invention to the exact construction and application herein shown and described for purposes of illustration as various modifications may occur to persons skilled in the art.

It is claimed and desired to secure by Letters Patent:

1. A corn harvester husking roll comprising a rotatably mounted shaft member, a pair of front and rear parts fixedly secured to said shaft member in axially spaced relation and presenting opposed end portions of reduced diameter, a tube surrounding said shaft member and having an internal diameter considerably greater than the external diameter of the portion of the shaft member enclosed thereby, means mounting said tube in spaced concentric relation with respect to said portion of the shaft member comprising annular plug members mounted on said shaft member for movement axially thereof and affording a radially rigid support for the opposite ends of said tube, said plug members and the opposed ends of said parts having portions thereof nonrotatably detachably engaged for relative axial movement so as to permit the ends of said tube to move longitudinally relative to said parts and shaft member as the tube flexes laterally relative to its longitudinal axis, said tube being formed of complementary rubber covered arcuate sections having outwardly flanged longitudinal edge portions disposed in abutting engagement, and externally accessible means detachably uniting said abutting edge portions of said sections.

2. A corn harvester husking roll comprising a rotatably mounted shaft member, a pair of front and rear parts fixedly secured to said shaft member in spaced end-opposed relation, a tube surrounding the portion of said shaft member included between said front and rear parts and having an internal diameter considerably greater than the external diameter of the portion of the

shaft member enclosed thereby, means mounting said tube in spaced concentric relation with respect to said portion of the shaft member comprising annular plug members mounted on said shaft member for movement axially thereof and affording a radially rigid support for the opposite ends of said tube, said plug members and the opposed ends of said parts having portions thereof nonrotatably detachably engaged for relative axial movement so as to permit the ends of said tube to move longitudinally relative to said parts and shaft member as the tube flexes laterally relative to its longitudinal axis, said tube being formed of complementary rubber covered arcuate sections having outwardly flanged longitudinal edge portions disposed in abutting engagement, said rubber covering having a thickness approximately equal to the width of said flanged edge portions, and externally accessible means detachably uniting said abutting edge portions of said sections.

3. A corn harvester husking roll comprising a rotatably mounted shaft member, a pair of front and rear parts fixedly secured to said shaft member in axial spaced relation and presenting opposed end portions of reduced diameter, a tube surrounding said shaft member and having an internal diameter considerably greater than the external diameter of the portion of the shaft member enclosed thereby, said tube being formed of complementary rubber covered arcuate sections having outwardly flanged longitudinal edge portions disposed in abutting relation and having its end portions telescopically surrounding and radially rigidly supported by the reduced end portions of said parts to extend in spaced concentric relation with respect to said included shaft portion, said rubber covering having a thickness approximately equal to the width of said flanged edge portions, externally accessible means detachably uniting said abutting edge portions of said sections, and means detachably retaining the telescoped end portions of said tube and parts nonrotatably engaged for relative axial movement.

4. A corn harvester husking roll comprising a rotatably mounted shaft member, a pair of front and rear parts fixedly secured to said shaft member in axially spaced relation and presenting opposed end portions of reduced diameter, a tube surrounding said shaft member and having its end portions telescopically surrounding and radially rigidly supported by the opposed reduced end portions of said parts, said tube being formed of complementary rubber covered arcuate sections having outwardly flanged longitudinal edge portions disposed in abutting engagement, said rubber covering having a thickness approximately equal to the width of said flanged edge portions, externally accessible means detachably uniting said abutting edge portions of said sections, and means detachably retaining the telescoped end portions of said tube and parts nonrotatably engaged for relative axial movement.

5. A corn harvester husking roll comprising a rotatably mounted shaft member, a pair of front and rear parts fixedly secured to said shaft member in axially spaced relation and presenting opposed cylindrical end portions of reduced diameter, a tube surrounding said shaft member and having its end portions telescopically surrounding and radially rigidly supported by said cylindrical end portions, said tube being formed of comple-

mentary rubber covered arcuate sections having outwardly flanged longitudinal edge portions disposed in abutting engagement, externally accessible means detachably uniting said abutting edge portions of said sections, and means detachably retaining the telescoped end portions of said tube and parts nonrotatably engaged for relative axial movement.

6. A tube for corn harvester husking rolls comprising interchangeable rubber covered arcuate sections having outwardly flanged longitudinal edge portions disposed in abutting engagement, said rubber covering having a thickness approximately equal to the width of said flanged edge portions, and externally accessible means detachably uniting said abutting edge portions of said sections.

7. A tube for corn harvester husking rolls comprising interchangeable rubber covered arcuate sections having outwardly flanged longitudinal edge portions detachably united in abutting relation, said rubber covering having a thickness approximately equal to the width of said flanged edge portions and having recesses therein affording access to the means detachably uniting said flanged portions.

8. A tube for corn harvester husking rolls comprising interchangeable rubber covered arcuate sections having outwardly flanged longitudinal edge portions detachably united in abutting relation, said rubber covering having recesses therein affording access to the means detachably uniting said flanged portions.

9. A corn harvester husking roll comprising a rotatably mounted shaft member, a pair of front and rear elements fixedly secured to said shaft member in axially spaced end-opposed relation, a relatively thin tube surrounding the portion of said shaft member included between said front and rear elements and having an internal diameter considerably greater than the external diameter of the portion of the shaft member enclosed thereby, and means mounting said tube in spaced concentric relation with respect to said shaft member comprising parts carried by opposite end portions of said tube and disposed adjacent the end-opposed portions of said front and rear elements, said parts and elements having portions thereof non-rotatably engaged for relative axial movement so as to permit the ends of the tube to move toward each other longitudinally relative to said elements and shaft member as the tube flexes laterally relative to the longitudinal axis of said shaft member.

10. A corn harvester husking roll comprising a rotatably mounted shaft member, a pair of front and rear elements fixedly secured to said shaft member in axially spaced end-opposed relation, a relatively thin tube surrounding the portion of said shaft member included between said front and rear elements and having an internal diameter considerably greater than the external diameter of the portion of said shaft member enclosed thereby, and means mounting said tube in spaced concentric relation with respect to said shaft member comprising the end-opposed portions of said front and rear elements and parts disposed adjacent thereto and carried by internal opposite end portions of said tube, said parts and elements having portions thereof non-rotatably detachably engaged for relative axial movement so as to permit the ends of the tube to move toward each other longitudinally relative to said elements and shaft member as the tube flexes

laterally relative to the longitudinal axis of said shaft member.

11. A corn harvester husking roll comprising a rotatably mounted shaft member, a pair of front and rear elements fixedly secured to said shaft member in axially spaced end-opposed relation, a relatively thin tube surrounding the portion of said shaft member included between said front and rear elements and having an internal diameter considerably greater than the external diameter of the portion of said shaft member enclosed thereby, and means mounting said tube in spaced concentric relation with respect to said shaft portion comprising annular plug members carried by and affording a radially rigid internal support for the opposite end portions of said tube, said plug members and the adjacent ends of said elements having portions thereof non-rotatably detachably engaged for relative axial movement so as to permit the ends of said tube to move toward each other longitudinally relative to said elements and shaft member as the unsupported portion of the tube flexes laterally relative to the longitudinal axis of said shaft member.

12. A corn harvester husking roll comprising a rotatably mounted shaft member, a pair of front and rear elements fixedly secured to said shaft member in axially spaced end-opposed relation, a relatively thin tube surrounding the portion of said shaft member included between said front and rear elements and having an internal diameter considerably greater than the external diameter of the portion of the shaft member enclosed thereby, and means mounting said tube in spaced concentric relation with respect to said shaft portion comprising parts carried by internal opposite end portions of said tube and nonrotatably detachably connecting said end portions of the tube and the adjacent ends of said elements for relative axial movement so as to permit the ends of the tube to move toward each other longitudinally relative to said elements and shaft member as the tube flexes laterally relative to the longitudinal axis of said shaft member.

13. A corn harvester husking roll comprising a rotatably mounted shaft member, a pair of front and rear parts fixedly secured to said shaft member in axially spaced end-opposed relation, a relatively thin tube surrounding the portion of said shaft member included between said elements and having an internal diameter considerably greater than the external diameter of the portion of the shaft member enclosed thereby, said tube having its opposite end portions telescopically engaging and supported by the end-opposed portions of said front and rear parts to extend in spaced concentric relation with respect to the portion of the shaft member enclosed thereby, and means detachably retaining the telescoped ends of said tube and parts non-rotatably engaged for relative axial movement so as to permit the ends of said tube to move toward each other longitudinally relative to said parts and shaft member as the unsupported portion of the tube flexes laterally relative to the longitudinal axis of said shaft member.

14. A corn harvester husking roll comprising a rotatably mounted shaft member, a pair of front and rear parts fixedly secured to said shaft member and presenting spaced opposed end portions of reduced diameter, a relatively thin tube surrounding the portion of said shaft member included between said parts and having an internal

diameter considerably greater than the external diameter of the portion of said shaft member enclosed thereby, said tube having its opposite ends telescopingly surrounding and radially rigidly supported by the reduced end portions of said front and rear parts to extend in spaced concentric relation with respect to said included shaft portion, and means detachably retaining the telescoped end portions of said tube and parts non-rotatably engaged for relative axial movement so as to permit the ends of the tube to move toward each other longitudinally relative to said parts and shaft member as the unsupported portion of the tube flexes laterally relative to the longitudinal axis of said shaft member.

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