Feb. 24, 1942. B. R. JOHNSON ET AL 2,274,548

CORNHUSKING MACHINE

Filed July 12, 1939

Fig. 1.

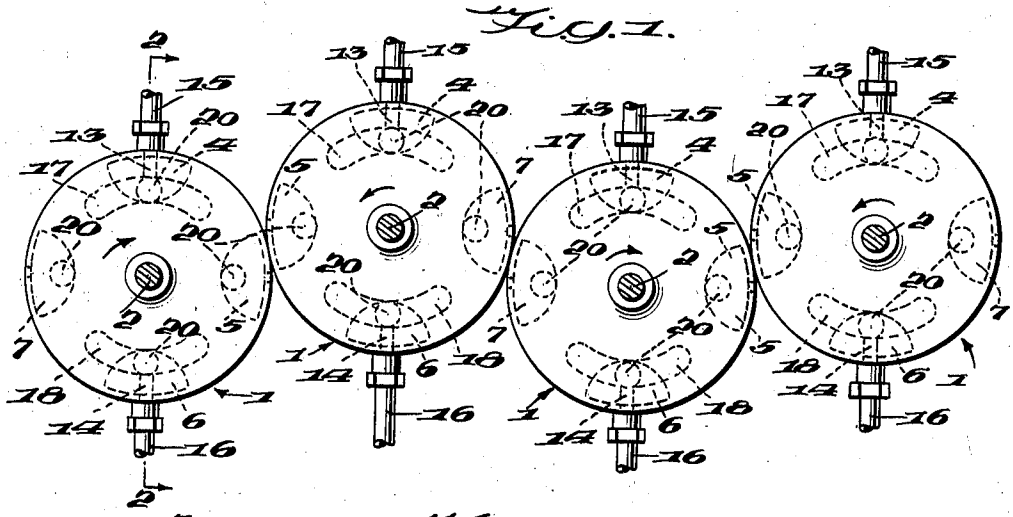


Fig. 2.

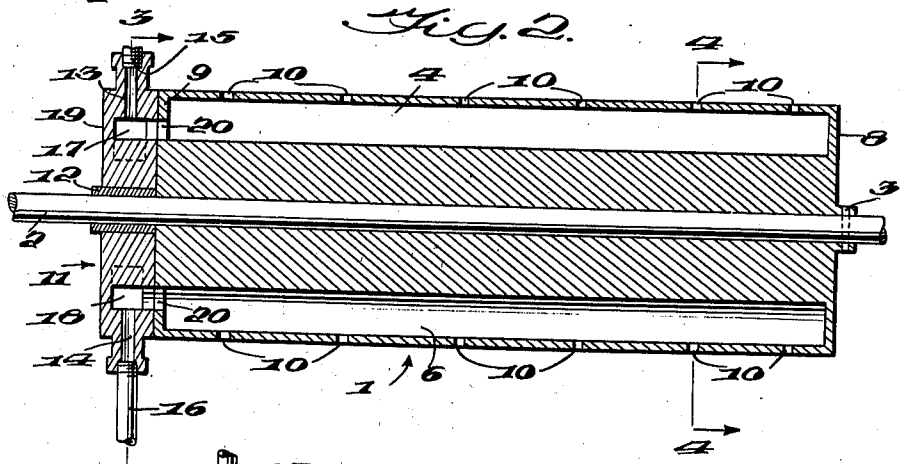


Fig. 3.

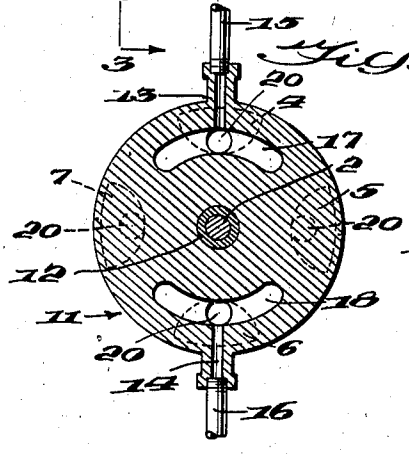
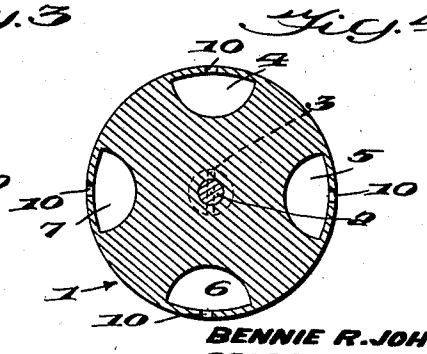


Fig. 4.



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Patented Feb. 24, 1942 2,274,548

UNITED STATES PATENT OFFICE

2,274,548

CORNHUSKING MACHINE

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Application July 12, 1939, Serial No. 284,082

16 Claims. (Cl. 130—5)

This invention relates to corn husking machines, and has reference to that type of machine wherein the husks are removed from the ear by the frictional engagement of cooperating rolls.

It is well known in the art to provide a series of rotatable rolls having the periphery of the rolls in contact with each other. The rolls are usually slightly inclined, so that the unhusked corn, when fed or otherwise placed on the rolls, will fall by gravity to the lower-most end of the rolls. The rolls rotate in different directions; that is, the first roll rotates in a clockwise direction, the second roll rotates in a counterclockwise direction, the third roll rotates in a clockwise direction, and so on. The unhusked corn falls to the point of contact between the rolls, and because of the frictional engagement between each pair of rolls, the corn husks are gripped between the rolls and are pulled or otherwise removed from the ear. The ear slides longitudinally down the rolls, while the husks fall beneath the rolls.

A serious problem has arisen in the art in an effort to obtain a proper "bite" or gripping action of the rolls upon the corn husks. Many attempts have have been made to remedy this difficulty, but insofar as applicants are aware, none of these attempts have effectively held the husks to the periphery of the rolls until the rolls contact each other, and at the same time, remove the husks from the rolls after the husks have been removed from the ears.

It is, therefore, an object of this invention to effectively hold the corn husks to the periphery of the rolls until the rolls come in contact with each other.

Another object of this invention is to effectively remove the husks from the rolls after the rolls have removed the husks from the ears.

We have found that by the use of suction through one roll of a pair, or through each roll of the pair, the corn husks are effectively held against the periphery of the roll or rolls. Also, we have found that by using air under pressure, we can effectively remove the husks from the underside of the rolls, after the husks have been removed from the ears. It is, therefore, another object of this invention to control the suction and pressure passing through the periphery of the roll or rolls, so that the suction and pressure passes through the periphery of the roll or rolls at timed intervals.

With the foregoing and other objects in view, this invention embodies the feature of construction, combination and arrangement of parts as will hereinafter more fully be described in detail, illustrated in the accompanying drawing, which disclose the preferred embodiment of the invention and set out in the claims appended hereto.

In the drawing:

Figure 1 is a side elevation of the rolls;

Figure 2 is a sectional view taken on line 2—2 of Figure 1;

Figure 3 is a sectional view taken on line 3—3 of Figure 2; and,

Figure 4 is a sectional view taken on line 4—4 of Figure 2.

Referring now to the drawing; reference character 1 generally indicates the husking rolls. Each roll is provided with a central bore through which shafts 2 extend. The rolls 1 are fixed to shafts 2 by pins 3. The rolls 1 are formed of metal or other suitable material, and are formed preferably by casting. The rolls are solid with the exception of hollow air chambers 4, 5, 6, and 7. These air chambers are located just beneath the periphery of the roll, and are diametrically opposed to each other. That is, air chamber 4 is just beneath the periphery of the top of the roll, while air chamber 6 is just beneath the periphery of the bottom of the roll. Air chambers 5 and 7 are located just beneath the periphery on each side of the roll. It will be noted, however, that the periphery of the rolls is continuous, the air chambers being located thereunder. These air chambers run longitudinally through and substantially the full length of the rolls. The air chambers terminate just short of each end, so as to provide end walls 8 and 9, the end walls being formed integrally with the rolls. The periphery of the roll adjacent to each air chamber is provided with a plurality of perforations 10. These perforations 10 may be of any desired size or number, and may be in any position.

Referring now to Figures 2 and 3, a valve, generally indicated at 11, is mounted on the shaft 2 through suitable bearings 12. This valve 11 does not rotate with the shaft 2, the same remaining stationary thereon. However, the valve 11 may be adjusted about the shaft 2 by any suitable means (not shown). The valve is formed of any suitable material, but preferably of cast metal. The valve takes the shape of a disk, and is of the same diameter as the rolls 1. The valve is provided with radially extending air ports 13 and 14, into which pipes 15 and 16 are threaded. Arcuate ports 17 and 18 communicate with the

air ports 13 and 14 respectively. The arcuate ports 17 and 18, however, extend through the inner side wall of the valve 11, and communicate with port openings 20 formed in the end wall 9 of the rolls 1. The pipes 15 are connected to a suitable source of vacuum (not shown), while the pipes 16 are connected to a suitable supply of air pressure, (not shown). It will be seen, therefore, that because of the creation of vacuum in pipes 15, atmospheric air enters the perforations 10, into air chambers 4, through port 20, into arcuate port 17, through radial port 13 and into pipe 15. Likewise, air under pressure enters pipe 16, and passes through port 14, into arcuate port 18, through port 20 into air chamber 6 and out into the atmosphere through perforations 10.

It will be understood that through pipes 15 a constant vacuum is maintained, and that pipes 16 are furnished with a constant supply of air pressure. Therefore, arcuate ports 17 and 18 will be maintained with a constant vacuum and air pressure through direct communication through ports 13 and 14 to pipes 15 and 16, respectively.

As will be seen by the direction arrows in Figure 1, reading from left to right, the first and third rolls rotate in a clockwise direction, while the second and fourth rolls rotate in a counter-clockwise direction. Assuming now that the rolls are rotating, unhusked corn is placed on the top of the rolls. When the port 20 of air chamber 4 reaches the right-hand portion of arcuate slot 17, suction is communicated into air chamber 4. The suction in chamber 4, through perforations 10, holds the corn husks against the periphery of the roll. This suction continues through chamber 4 until the port 20 passes beyond the arcuate port 17, after which the suction to air chamber 4 is cut off. However, this suction will continue long enough to hold the corn husks to the periphery of the roll until the periphery of the two rolls almost contact each other. At this point, frictional engagement of the two rolls upon the corn husks will pull the husks from the ears. At the same time suction is created in air chamber 4 through arcuate port 17, air chamber 6 receives pressure from arcuate port 18. In other words, when air chamber 4 is nearing the top, suction is created in that portion of the periphery of the roll overlying said air chamber to hold the corn husks thereto. At the same time, the air chamber diametrically opposed (chamber 6) will be nearing the bottom, and pressure will be supplied to this chamber to remove the husks from the periphery of the roll overlying the same. As the rolls continue to rotate, the suction and pressure are cut off from chambers 4 and 6 respectively, and suction and pressure will be supplied to chambers 7 and 5 respectively; and so on. Therefore, suction is always created in that portion of the periphery of the roll which is on the top to hold husks thereto, while that portion of the periphery of the roll which is on the bottom is always supplied with pressure to remove the husks therefrom after the husks have been removed from the ears.

It will be obvious that by adjusting the valve 11, by turning the same in one direction or the other, the suction and pressure, in relation to the periphery of the roll, may be adjusted. That is, the suction and pressure may start and end sooner or later, as desired.

It will be readily understood that this invention provides corn husking rolls which will hold the corn husks thereto until the husks are removed from the ears, and that thereafter, the husks are removed from the rolls. This invention eliminates the necessity of providing resilient rolls and/or rolls having "tread" designs to hold the husks to the roll, and the necessity of mechanical means for removing the husks from the rolls after the husks have been removed from the ears.

While an embodiment of this invention has been shown and described, it is to be understood that various modifications thereof may be apparent to those skilled in the art without departing from the spirit and scope of this invention, and, therefore, the same is to be only limited by the scope of the prior art and the appended claims.

We claim:

1. In a corn husking machine, a plurality of rotatable rolls, one roll capable of being rotated in clock-wise direction, another roll capable of being rotated in counterclock-wise direction and co-operating with the first roll to form a bight to remove the husks from ears of corn, one of said rolls having a plurality of air chambers adjacent to the periphery of said roll which communicates with the atmosphere through vents in the periphery of said roll, means for supplying suction to said chambers in succession when said chambers are above the bight for holding the corn husks to the periphery of the roll so that the bight of the rolls may remove the corn husks from the ears of corn, and means for supplying air under pressure greater than atmospheric pressure to said chambers in succession when said chambers are below the bight for removing the corn husks from the periphery of the roll.

2. In a corn husking machine, a plurality of rotatable rolls, one roll capable of being rotated in clock-wise direction, another roll capable of being rotated in counter-clock-wise direction and co-operating with the first roll to form a bight to remove the husks from ears of corn, one of said rolls having a plurality of air chambers adjacent to the periphery of said roll which communicate with the atmosphere through the periphery of said roll, and means for alternately supplying suction and air under pressure greater than atmospheric pressure to said chambers in succession, the suction being supplied to the chambers when the chambers are above the bight to hold the corn husks to the periphery of the roll, and the air under pressure being supplied to the chambers when the chambers are below the bight to remove the corn husks from the roll.

3. In a corn husking machine, a plurality of rotatable rolls, one roll capable of being rotated in clock-wise direction, another roll capable of being rotated in counter-clock-wise direction and co-operating with the first roll to form a bight to remove the husks from corn ears, one of said rolls having a plurality of air chambers adjacent to the periphery of said roll which communicates with the atmosphere through the periphery of said roll, an adjustable valve adjacent to one end of said roll adapted to regulate a supply of suction to one of said chambers when said chamber is above the bight to hold the corn husks to the periphery of the roll so that the bight of the rolls may remove the corn husks from the ears of corn, and at the same time, regulate a supply of air under pressure greater than atmospheric pressure to another of said chambers when said chamber is below the bight to remove the corn husks from the periphery of the roll.

4. In a corn husking machine, a plurality of rotatable rolls, one roll capable of being rotated

in clock-wise direction, another roll capable of being rotated in counter-clock-wise direction and co-operating with the first roll to form a bight to remove the husks from ears of corn, one of said rolls having a plurality of air chambers adjacent to the periphery of said roll which communicate with the atmosphere through vents located in the periphery of the roll, an adjustable valve adjacent to one end of said roll adapted to regulate a supply of suction to said chambers in succession when said chambers are above the bight to hold the corn husks to the periphery of the roll so that the bight of the rolls may remove the corn husks from the ears of corn, and at the same time, regulate a supply of air under a pressure greater than atmospheric pressure to said chambers in succession when said chambers are below the bight to remove the corn husks from the periphery of the roll.

5. In a corn husking machine, a plurality of rotatable rolls, one roll being capable of being rotated in clock-wise direction, another roll capable of being rotated in counter-clock-wise direction and co-operating with the first roll to form a bight to remove the husks from ears of corn, one of said rolls having a plurality of air chambers adjacent to the periphery of said roll which communicate with the atmosphere through the periphery of said roll, and means for alternately supplying suction and air under pressure greater than atmospheric pressure to said chambers at predetermined portions of the rotational cycle of said roll.

6. In a corn husking machine, a plurality of rotatable rolls cooperating with each other when rotating to form a bight to remove the husks from corn ears, one of said rolls having a plurality of air chambers extending longitudinally of said roll and being located adjacent to the periphery of the roll so that the air chambers communicate to the atmosphere through apertures in the periphery of the roll, and means for supplying and cutting off suction to said air chambers, said means operating to supply suction to said chambers when the chambers are above the bight and operating to cut off the supply of suction when the chambers are below the bight.

7. In a corn husking machine, a plurality of rotatable rolls cooperating with each other when rotating to form a bight to remove the husks from corn ears, one of said rolls having a plurality of air chambers extending longitudinally of said roll and being located adjacent to the periphery of the roll so that the air chambers communicate to the atmosphere through apertures in the periphery of the roll, and means for supplying and cutting off air under greater than atmospheric pressure to said air chambers, said means operating to supply said air to the chambers when the chambers are below the bight and operating to cut off the supply of said air when the chambers are above the bight.

8. In a corn husking machine, a plurality of rotatable rolls cooperating with each other when rotating to form a bight to remove the husks from corn ears, one of said rolls having a plurality of air chambers extending longitudinally of said roll and being located adjacent to the periphery of the roll so that the air chambers communicate to the atmosphere through apertures in the periphery of the roll, and means for supplying and cutting off suction and air under greater than atmospheric pressure to said air chambers, said means operating to supply the suction to the chambers when the chambers are above the bight and cutting off the supply of suction when said chambers are below the bight.

9. In a corn husking machine, a plurality of rotatable rolls cooperating with each other when rotating to form a bight to remove the husks from corn ears, one of said rolls having a plurality of air chambers extending longitudinally of said roll and being located adjacent to the periphery of the roll so that the air chambers communicate to the atmosphere through openings in the periphery of the roll, and means for supplying suction to one of said air chambers when said chamber is above the bight to hold the corn husks to a portion of the periphery of said rolls, and means for supplying air under greater than atmospheric pressure to another of said air chambers when said chamber is below the bight to remove the corn husks from a portion of the periphery of said roll after the husks have been removed from the corn ears.

10. In a corn husking machine, a plurality of rotatable rolls cooperating with each other when rotating to form a bight to remove the husks from corn ears, one of said rolls having a plurality of air chambers extending longitudinally of said roll and being located adjacent to the periphery of the roll so that the air chambers communicate to the atmosphere through openings in the periphery of the roll, and means for supplying suction to one of said air chambers when said chamber is above the bight and simultaneously supplying air under greater than atmospheric pressure to another of said air chambers located below the bight for holding the corn husks to the periphery of said roll until the husks have been removed from the corn ears, and thereafter removing the corn husks from said roll.

11. In a corn husking machine, a plurality of rotatable rolls cooperating with each other when rotating to form a bight to remove the husks from corn ears, one of said rolls having a plurality of air chambers extending longitudinally of said roll and being located adjacent to the periphery of the roll so that the air chambers communicate to the atmosphere through openings in the periphery of the roll, and means for supplying suction to said air chambers when said chambers are above the bight, and for cutting off the supply of suction when said chambers are below the bight, said means including a valve located adjacent to one end of said roll.

12. In a corn husking machine, a plurality of rotatable rolls co-operating with each other when rotating to form a bight to remove the husks from corn ears, one of said rolls having a plurality of air chambers extending longitudinally of said roll and being located adjacent to the periphery of the roll so that the air chambers communicate to the atmosphere through openings in the periphery of the roll, and means for supplying suction to said chambers when said chambers are above the bight and for cutting off the supply of suction when said chambers are below the bight, and means for supplying air under pressure greater than atmospheric pressure to said chambers when said chambers are below the bight and for cutting off the supply of said air when the chambers are above the bight, both of said means including a valve located adjacent to one end of said roll.

13. In a corn husking machine, a plurality of rotatable rolls cooperating with each other when rotating to form a bight to remove the husks from corn ears, one of said rolls having a plurality of air chambers extending longitudinally

of said roll and being located adjacent to the periphery of the roll so that the air chambers communicate to the atmosphere through openings in the periphery of the roll, and means for supplying suction to said air chambers when said chambers are above the bight, and for cutting off the supply of suction when said chambers are below the bight, said means including a normally stationary valve abutting one end of said rotatable roll.

14. In a corn husking machine, a plurality of rotatable rolls cooperating with each other when rotating to form a bight to remove the husks from corn ears, one of said rolls having a plurality of air chambers extending longitudinally of said roll and being located adjacent to the periphery of the roll so that the air chambers communicate to the atmosphere through openings in the periphery of the roll, and means for supplying suction to one of said air chambers when said chamber is above the bight and simultaneously supplying air under greater than atmospheric pressure to another of said air chambers located below the bight, said means including a normally stationary but adjustable valve located adjacent to one end of said roll.

15. In a corn husking machine, a plurality of rotatable rolls cooperating with each other when rotating to form a bight to remove the husks from corn ears, one of said rolls having a plurality of air chambers extending longitudinally of said roll and being located adjacent to the periphery of the roll so that the air chambers communicate to the atmosphere through openings in the periphery of the roll, and means for supplying suction to one of said air chambers when said chamber is above the bight and simultaneously supplying air under greater than atmospheric pressure to another of said air chambers located below the bight, said means including a normally stationary but adjustable valve located adjacent to one end of said roll, the adjustment of said valve simultaneously effecting the supply of suction and air under pressure to said chambers.

16. In a corn husking machine, a plurality of rotatable rolls cooperating with each other when rotating to form a bight to remove the husks from corn ears, one of said rolls having an air chamber therein and extending longitudinally of said roll, said air chamber communicating with the atmosphere through a plurality of perforations in the periphery of said roll, means for supplying suction to said chamber when said chamber is above the bight to thus draw air from the atmosphere into said chamber thereby holding the corn husks to the periphery of said roll, means for cutting off the supply of suction to said air chamber after the corn husks have been removed from the corn ears and after said chamber is below the bight, and means for supplying air under greater than atmospheric pressure to said chamber after said chamber is below the bight to remove the husks from the periphery of the roll.

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