Jan. 23, 1923.

1,443,213

W. D. CHANEY.
RICE HULLING MACHINE.
FILED MAY 29, 1922.

2 SHEETS-SHEET 1

FIG. 1.

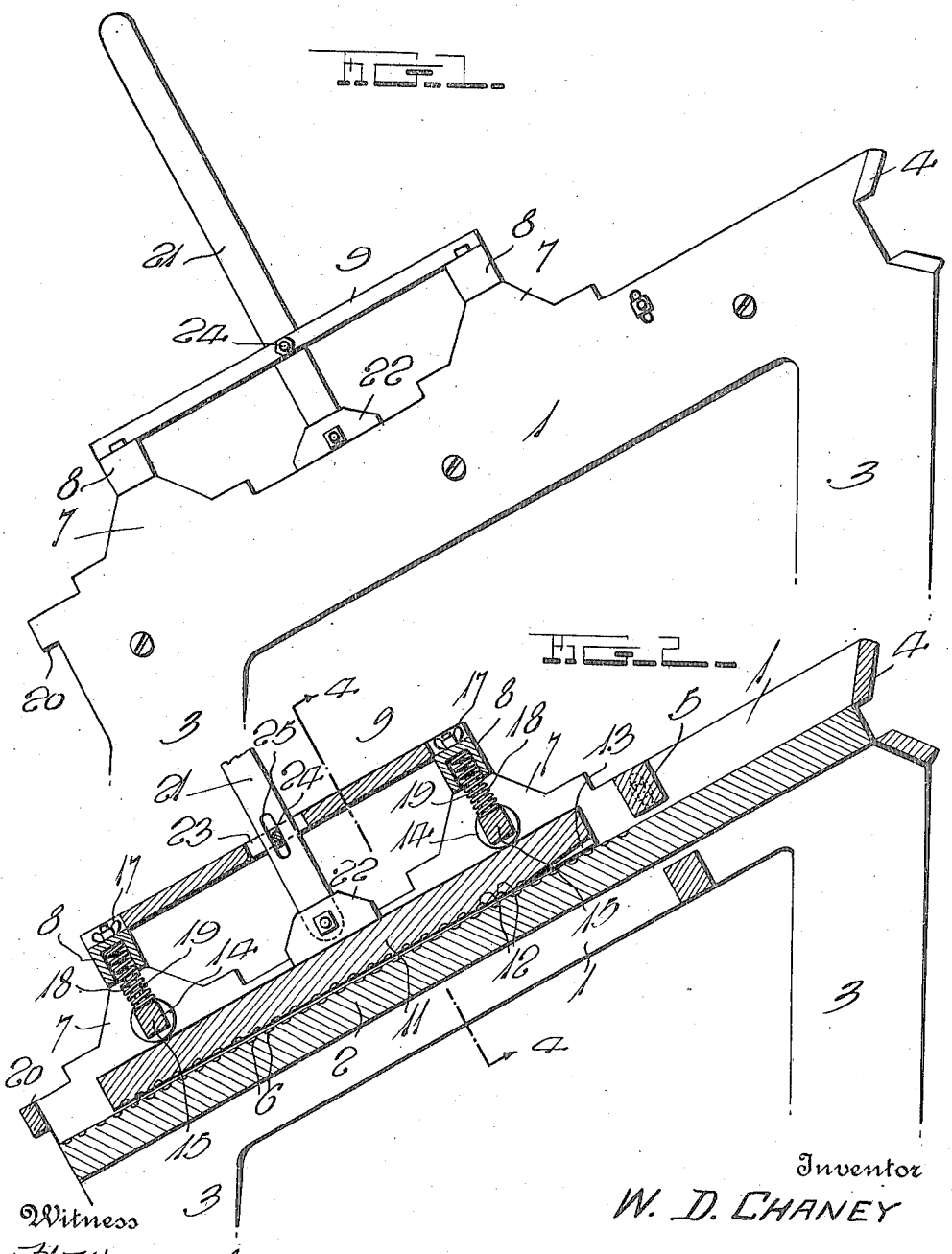


FIG. 2.

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2 SHEETS-SHEET 2

FIG. 4.

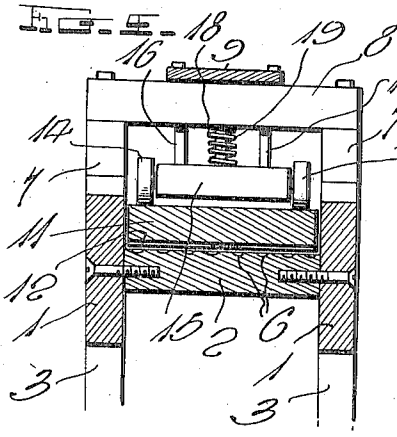


FIG. 5.

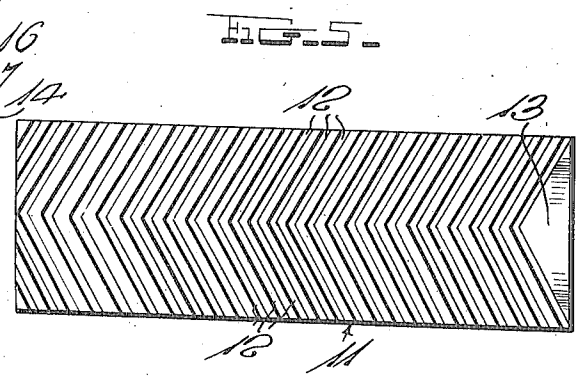


FIG. 6.

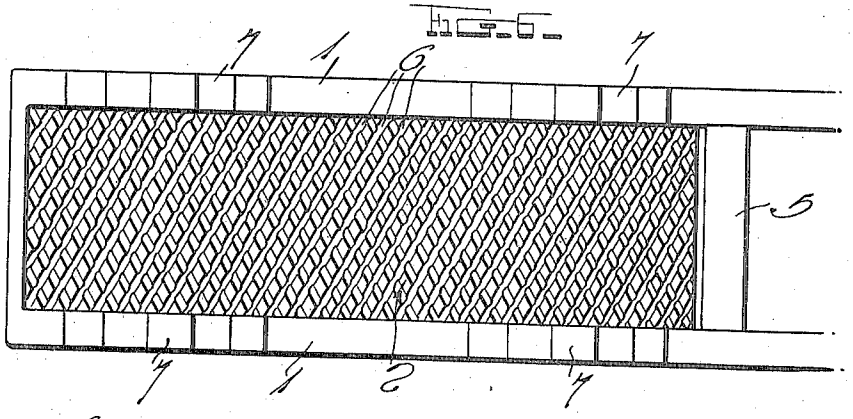
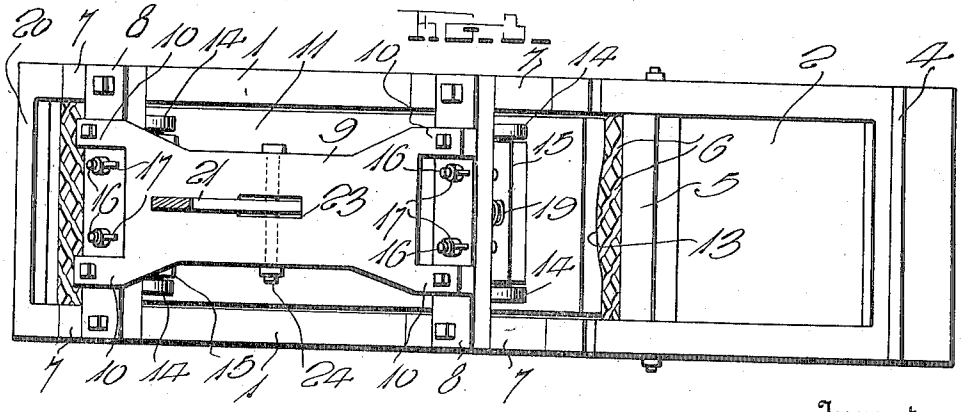


FIG. 3.



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UNITED STATES PATENT OFFICE.

WILLIAM D. CHANEY, OF HILLSBORO, OHIO.

RICE-HULLING MACHINE.

Application filed May 29, 1922. Serial No. 564,476.

To all whom it may concern:

Be it known that I, WILLIAM D. CHANEY, a citizen of the United States, residing at Hillsboro, in the county of Highland and State of Ohio, have invented certain new and useful Improvements in Rice-Hulling Machines; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to an improved rice hulling machine and one object of the invention is to provide a hulling machine which is so constructed that when rice is passed through the machine practically all of the rice will be hulled and to further so construct the machine that rice passed through it will not be broken. It has been found that with machines now in use, a great deal of the rice passes through the machine without being hulled and that from twenty-one to sixty-five per cent of the rice is broken, whereas with this machine, ninety-five per cent of the rice is hulled and the breakage only amounts to about three per cent.

Another object of this invention is to so construct this machine that the upper movable board may be adjusted so that it can accommodate itself to grain which are relatively large or grain which are relatively small. Rice grows in different sizes and by having this upper board adjustable, it can be readily set so that it will not have sufficient pressure to break the grain but at the same time will have sufficient pressure to cause proper hulling of the rice.

Another object of the invention is to provide these boards with grooved faces so that as the boards move longitudinally and the rice passes between them, the rice will be moved transversely of the machine from one side to the other and thus the hulls removed in a very efficient manner.

Another object of the invention is to provide a machine which may be built for family use and will be so constructed that it may be very easily operated, it being understood that the operating means can be for hand use or in a larger machine have suitable operating means adapted to be power-driven.

Another object of the invention is to so construct this machine that the flow of rice from the hopper portion thereof into position for passing between the upper and lower hulling boards may be controlled.

This invention is illustrated in the accompanying drawings, wherein:

Figure 1 is a view showing the machine in side elevation.

Figure 2 is a longitudinal sectional view through the machine.

Figure 3 is a top plan view.

Figure 4 is a transverse sectional view taken along the line 4—4 of Fig. 2.

Figure 5 is a view looking at the under rice-engaging face of the upper board.

Figure 6 is a top plan view of the machine with the upper board removed and showing the face of the lower board.

This improved hulling machine is provided with a frame having side walls 1 between which is rigidly secured the lower board 2. Suitable supporting legs 3 are provided for the frame, the supporting legs being arranged as shown in Figs. 1 and 2 so that the board 2 will be positioned at an incline as shown thus causing the rice to have a tendency to move downwardly along the board 2. The upper end portion of this board is to provide a hopper portion upon which the rice to be hulled will be placed and this hopper portion is provided with an end wall 4 and a forward wall 5 which extends between the side walls 1 and adjustably mounted so that it may be moved vertically. By moving the partition or front wall 5 of the hopper portion and securing it in a set position, the amount of rice which passes beneath this partition can be controlled and thus the speed at which the rice is fed to the hulling machine controlled. The lower or stationary hulling board 2 has its upper face provided with grooves 6 which extend diagonally across the board in crossed relation as shown clearly in Fig. 6 thus providing grooves which will cause the rice to have a tendency to move transversely of the boards from one side to the other as it moves along the boards longitudinally. Bolsters 7 extend upwardly from the upper edges of the side walls 1 and these bolsters carry cross bars 8 which in their turn carry a top board or bearing board 9 so that this bearing board which

extends longitudinally of the machine will be supported in spaced relation above the lower hulling board 2. The end portions of this bearing board 9 are cut away to provide finger portions 10 through which the fasteners pass to secure this bearing board to the supporting bars 8.

The upper hulling board 11 fits upon the lower hulling board 2 between the side walls 1 of this machine and this upper or movable hulling board has its under face provided with V-shaped grooves 12 which extend transversely of the board as shown in Fig. 5. From an inspection of this Fig. 5, it will be seen that as the board moves longitudinally, the grooves will have a tendency to move the grain transversely of the board towards the sides and towards the center thereof and will co-operate with the grooves 6 of the board 2 to thoroughly remove the hulls. It should be further noted that the grooves 12 at one end of the board have been omitted and the board shaped to provide a V-shaped pocket 13 so that the grains of rice may readily pass between the board 2 and the upper end of the movable board 11. This board 11 extends beneath the cross bars 8 and has its end portions engaged by rollers 14 carried by blocks 15. These blocks 15 are provided with threaded stems 16 which extend upwardly through the cross bars 8 and carry winged nuts 17 so that by adjusting these nuts 17, the blocks 15 may be moved upwardly against the action of springs 18 positioned about pins 19 between the threaded stems 16. These springs 19 engage the cross bars 8 and blocks 15 and will have a tendency to yieldably hold the upper hulling board against upward movement but at the same time will permit sufficient movement for proper hulling. By adjusting the winged nuts 17 the extent to which the pressure devices may move the board 11 towards the board 2 may be controlled and therefore the boards can be prevented from being held close enough to the board 2 to cause breakage of large rice. This board 11 is to have reciprocating movement over the board 2 and will have its movement limited by the partition 15 and also by means of an abutment 20 at the lower ends of the walls 1. In the present illustration, the device is to be operated by hand and there has therefore been provided an operating lever 21 which is pivotally connected with a block 22 carried by the board 11 and extends upwardly through a slot 23 formed in the bearing board 9. A pivot pin 24 extends through the slot 23 and through a slot 25 which extends longitudinally of the lever 21 so that by rocking the lever longitudinal reciprocating movement can be imparted to the upper hulling board 11. The provision of the slot 25 permits the lever to move upwardly through the slot 23 when the winged nuts 17 are turned to vertically adjust the pressure devices. While the machine has been shown provided with a lever 21 for hand operation of the device, it is to be understood that this is only one means which may be employed for imparting reciprocating movement to the upper hulling board 11 and that any suitable means may be provided, the said means being either hand-operated or power driven according to the size of machine built.

When this machine is in use, the rice which is to be hulled is placed upon the hopper forming portion of the lower stationary hulling board 2 and since the machine is tilted as shown in Figs. 1 and 2, the rice will have a tendency to pass beneath the partition 5 which will be set to control the speed at which the rice passes from the hopper portion of the machine. This rice passes between the board 2 and the upper end portion of the board 11 and as the upper movable hulling board reciprocates, the rice will be moved transversely of the board and will gradually work down the lower board from the upper end to the lower end. As the grains of rice move along the lower stationary hulling board, the hulls will be removed in a very efficient manner but the grains of rice will not be broken due to the fact that the upper board can be set the proper distance for thorough hulling without excessive pressure being applied to the grains of rice. There has thus been provided a hulling machine so constructed that the rice can be caused to pass between the two boards in a very efficient manner for thorough hulling and there has further been provided a machine in which the pressure upon the upper board can be controlled to prevent breakage. The elements 2 and 11 have been termed hulling boards but it is to be understood that these as well as the rest of the machine may be formed of wood, metal or any other suitable material.

I claim:

1. A rice hulling machine comprising a structure including a lower hulling board having grooves extending diagonally across its upper face and in crossed relation, and an upper hulling element positioned above the lower hulling element and movable longitudinally thereof and having its under face provided with grooves extending diagonally from the sides and converging at the center.

2. A rice hulling machine including a lower hulling board and an upper hulling board movable longitudinally of the lower hulling board, the lower board having its upper face provided with grooves extending diagonally from one side to the other and in crossed relation, the upper hulling board having its under face provided with grooves extending diagonally from the sides and meeting at the center, means for impart-

ing reciprocating movement to the upper hulling board longitudinally of the lower board, and pressure means for yieldably holding the upper board in engagement with the lower board.

3. A rice hulling machine comprising opposed hulling boards, one being movable longitudinally of the other, one board having its operating face provided with grooves extending diagonally across the board and in crossed relation and the other having its operating face provided with grooves extending from the sides of the boards in converging relation towards the center of the board.

4. A rice hulling machine comprising a frame including a lower hulling board, cross bars extending above the lower hulling board and having openings, an upper hulling board upon the lower hulling board, pressure means for the upper board operatively associated with the cross bars and each including a carriage element including rollers for engaging the upper hulling board and stems extending through the openings in the cross bars, guide pins extending upwardly from the carriages, springs about the guide pins having their upper ends engaging the cross bars and yieldably holding the carriages against upward movement with the rollers in engagement with the upper board, and securing nuts carried by the upper ends of said stems and engaging the cross bars for permitting adjustment to control movement of the carriages towards the upper hulling board and control pressure exerted against the upper hulling board.

5. A rice hulling machine comprising a frame including side walls and a lower hulling board between the side walls, cross bars extending from one wall to the other and having openings between the walls, an upper hulling board upon the lower hulling board, pressure means for the upper board operatively associated with said cross bars and each including a carriage element including rollers for engaging the upper hulling board and stems extending through the openings in the cross bars, a guide pin intermediate the stems, a spring about the guide pin having its upper end engaging the cross bar and yieldably holding the rollers in engagement with the upper board, and securing nuts carried by the upper ends of said stems and engaging the cross bars for permitting adjustment to control pressure exerted against the upper hulling board.

6. The structure of claim 5 and a bearing strip carried by said cross bars and extending longitudinally of the upper board and having a longitudinally extending slot between the cross bars, a lever pivotally connected with the upper hulling board and extending through the slot of the bearing strip, and a pivot pin passing through the slots of the bearing strip and lever handle.

7. A rice hulling machine comprising a frame including side walls and a lower hulling board between the side walls, the hulling board being pitched at an incline, an upper end wall extending between the side walls at the upper end of said hulling board, a partition extending between the side walls and adjustable towards and away from the hulling board to permit passage of material beneath the partition to be controlled, the hulling board between said partition and the lower end of the board being provided with grooves extending diagonally of the board in crossed relation, an upper hulling board upon the lower hulling board having its underface provided with diagonally extending grooves converging at the center of the board, means for imparting reciprocating movement to the upper hulling board longitudinally of the lower board, and pressure means for yieldably holding the upper board in engagement with the lower board.

8. A rice hulling machine comprising a frame including side walls and a lower hulling board between the side walls, an upper wall forming strip at the upper end of the hulling board, a partition extending between the side walls in spaced relation to the upper ends thereof and together with the upper wall and upper end portions of the side walls and lower hulling board forming a hopper, said partition being adjustable towards and away from the hulling board to permit rice to pass from the hopper beneath the partition at a desired speed, an upper hulling board resting upon the lower board between the partition and the lower end of the lower hulling board, means for imparting movement to the upper hulling board, and means for yieldably holding the upper board in engagement with the lower board.

In testimony whereof I have hereunto set my hand.

WILLIAM D. CHANEY.