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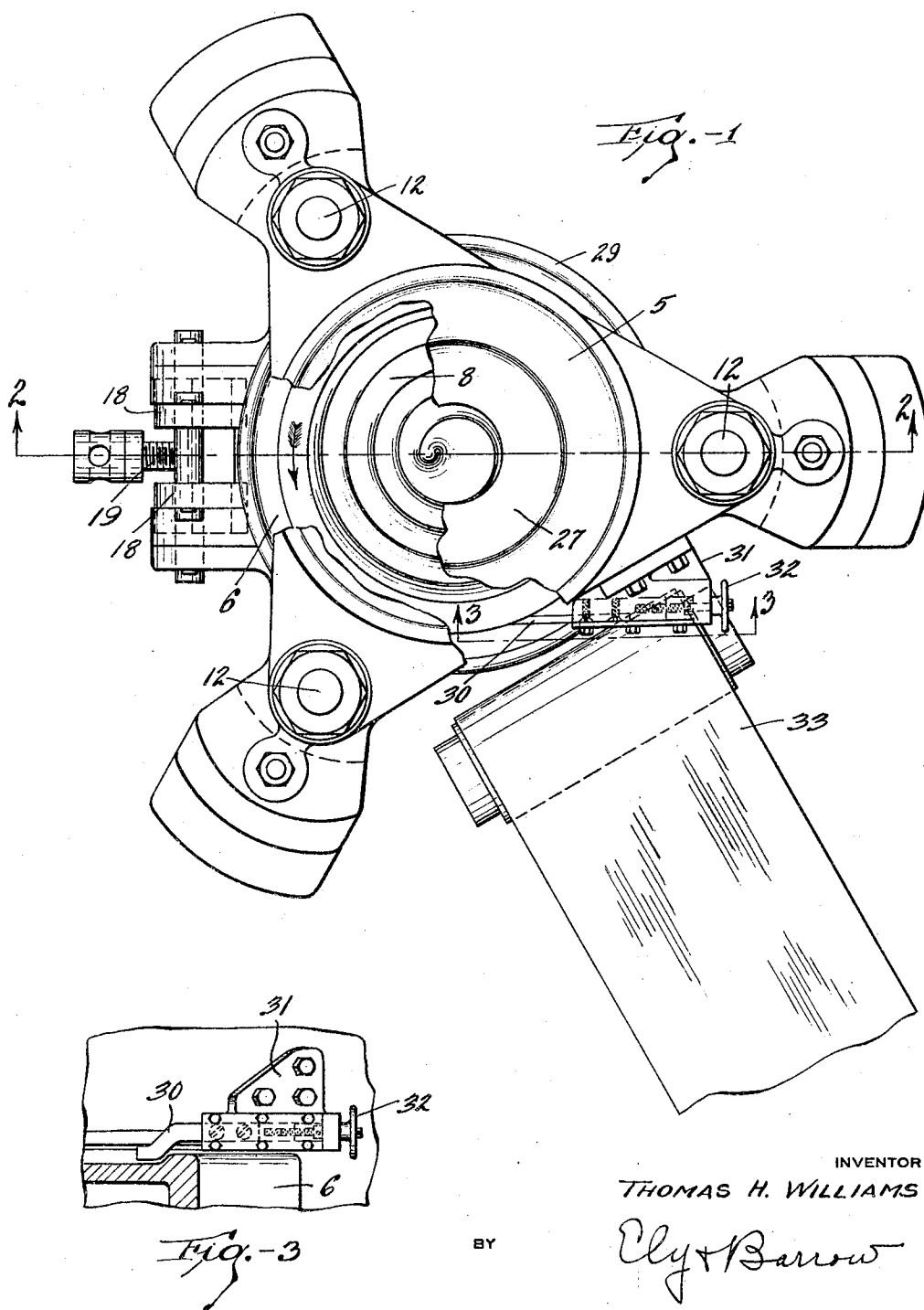
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MASTICATOR

Filed Aug. 16, 1930

2 Sheets-Sheet 1



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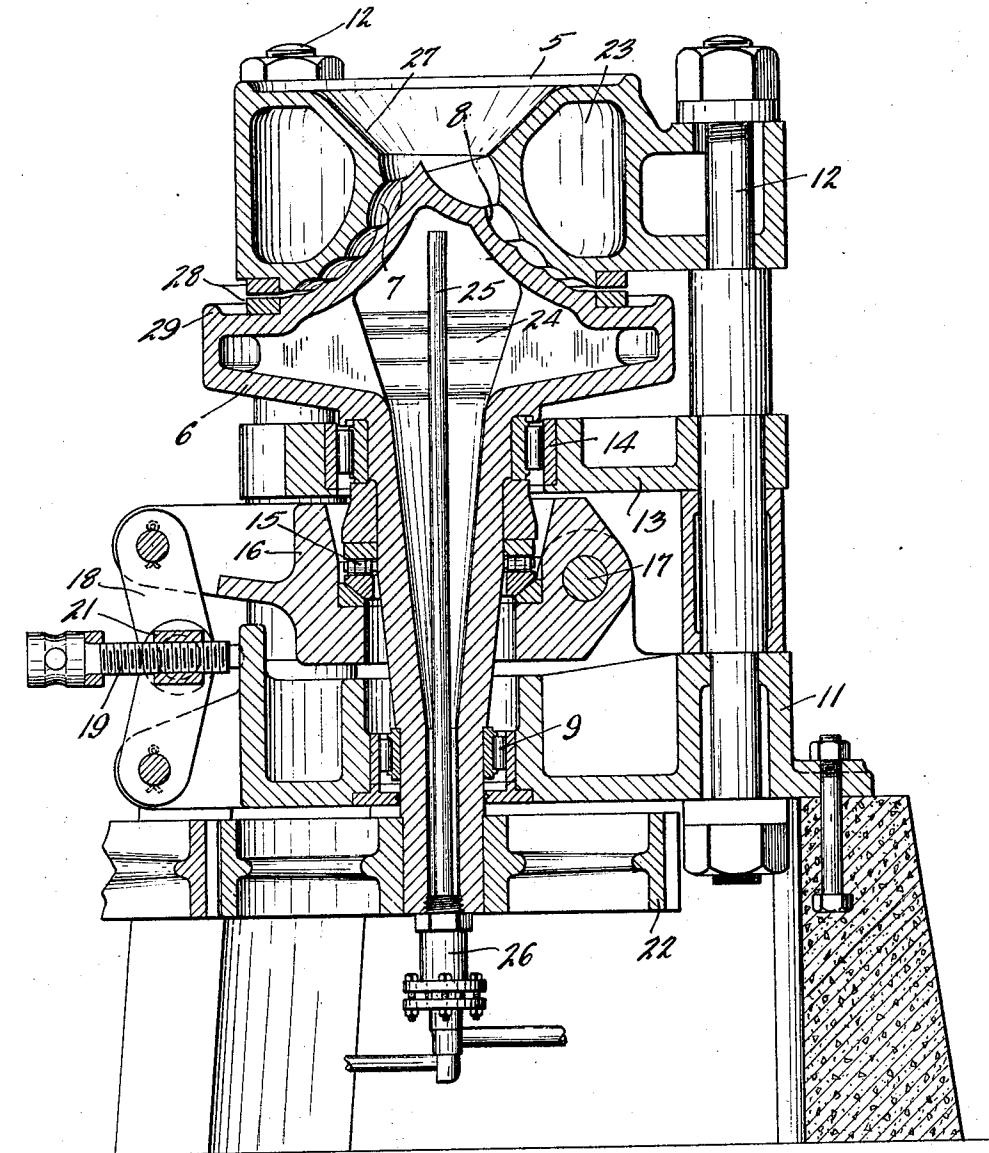


Fig. 2

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MASTICATOR

Application filed August 16, 1930. Serial No. 475,771.

This invention relates to apparatus for masticating, refining or mixing materials such as rubber.

The general object of the invention resides in the provision of an improved apparatus for masticating or mixing materials such as in the compounding or refining of crude or reclaimed rubber and particularly to provide apparatus of this type which can be adjusted to control the degree of mastication of the materials or to permit the effective use of the apparatus upon materials of different consistencies.

A further object of the invention is to provide an apparatus of this type with effective means for removal of the treated materials.

The foregoing and other objects of the invention are achieved in the apparatus illustrated in the accompanying drawings and described below, it being understood that the invention is not limited to the particular form thereof shown and described.

In the drawings,

Figure 1 is a plan view, partly broken away, of apparatus embodying the invention;

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

Figure 3 is a sectional view taken on line 3—3 of Figure 1.

The embodiment of the invention illustrated comprises a head 5 and a rotor 6 which are formed with cooperating, conical, spirally grooved surfaces 7 and 8 so designed as to feed the material outwardly and downwardly while masticating the same there being a single, continuous spiral groove in each of the said grooved surfaces. The rotor 6 is radially journaled as at 9 in a suitably anchored base 11. The head 5 is secured to the base 11 by a plurality of tie rods 12 which also serve to carry a spider 13 which radially journals the rotor 6 at 14. The rotor 6 is also supported by thrust bearing 15.

In order to control the masticating operation of the machine to determine the degree of mastication or to permit the use of the machine for materials of different consistencies, means for varying the distance between the cooperating surfaces of the rotor 6 and head 5

are provided. To this end the base 11 is formed with suitable ears to which a yoke 16 is pivoted as at 17. The yoke carries the thrust bearing 15 which is of the self-aligning type as illustrated in Figure 2. The unpivoted end of the yoke is adjustably secured to the base 11 which may be accomplished through the agency of a toggle linkage 18 having a screw 19 extending through a nut 21 secured to the center of the toggle. The screw can be rotated by suitable means and its end bears against the side of the base 11 so that by turning the screw 19 the distance between the rotor 6 and head 5 is adjusted.

The rotor 6 is driven by any suitable means such as gear 22 which is fixed to the rotor.

In order to control the temperature of the material operated on the head 5 is jacketed as at 23 and the rotor 6 is jacketed as at 24 for the reception of circulated temperature controlling fluid. A pipe 25 extending through a stuffing box 26 may be provided to supply the temperature controlling medium to the end of the rotor.

The head 5 is formed with a hopper 27 for the reception of the material to be treated.

At the lower ends of the cooperating spiral grooves the rotor and head are preferably provided with hardened steel rings 28 which give a final masticating action to the material and between which the material is delivered. The rotor 6 is formed with an annular tray or shelf 29 which serves to catch the material as it is forced out between rings 28. In order to remove the treated material from the tray 29 a knife 30 may be provided which may be carried in a bracket 31 fixed to the head 5 of the apparatus and which is adjustable by a hand wheel 32 so that the knife 30 may be moved toward and from the opening between the rings 28. The knife 30 serves to scrape the treated material from the tray 29, a conveyor 33 preferably being provided to receive the material to conduct it to a point at which it may be further treated or used.

In the operation of the device the material to be treated is fed in the hopper 27 and the rotor 6 is driven which will cause the material to be drawn down between the head and the rotor due to the cooperating action of the

spiral grooves 7 and 8. The material is given a rolling, masticating and mixing action which is particularly desirable in many operations in the rubber art. The material is finally forced between the rings 28 and into the annular tray 29 from which it may be removed by knife 30. The material may be completely treated in one operation or may be repeatedly passed through the same machine or in succession through a series thereof with or without the addition of other materials. Various adaptations and arrangements of the apparatus will suggest themselves to those skilled in the art.

The temperature of the treated material can be controlled during the operation by the temperature of the fluid circulated through the jackets of the rotor and head. The degree of mastication can be controlled and the machine set for handling materials of different consistencies by adjusting the screw 19 which moves the rotor 6 to or from the head 5. The radial bearings 9 and 14 are designed to permit some axial movement of the journaled members.

While the apparatus has been illustrated in a vertical position it will be apparent that it may be suitably modified for use in other positions.

As many changes could be made in the construction within the spirit of the invention, it is intended that all matter shown in the accompanying drawings or described herein shall be interpreted as illustrative only and not in a limiting sense, and that various modifications of the invention may be resorted to without departing from the spirit of the invention or the scope of the appended claims.

What is claimed is:—

1. A masticator comprising a rotor journaled with its axis vertical, a fixed head above the rotor and providing a hopper adapted to deliver material through the head onto the rotor, the upper surface of said rotor and the under surface of said head being formed with cooperating conical surfaces having spiral grooves thereon adapted to feed the material downwardly and outwardly between the head and rotor, a pair of juxtaposed, hardened rings adjacent the discharge end of the cooperating spiral grooves, one of said rings being fixed on the outer periphery of the rotor and the other on the outer periphery of the head, means on the outer periphery of the rotor for receiving the treated material after it is discharged from the head and rotor, and means for scraping the masticated material from the rotor.

2. A masticator comprising a rotor journaled with its axis vertical, a fixed head above the rotor and providing a hopper adapted to deliver material through the head onto the rotor, the upper surface of said rotor and the under surface of said head being

formed with cooperating conical surfaces having spiral grooves thereon adapted to feed the material downwardly and outwardly between the head and rotor, a pair of juxtaposed, hardened rings adjacent the discharge end of the cooperating spiral grooves, one of said rings being fixed on the outer periphery of the rotor and the other on the outer periphery of the head, and means on the outer periphery of the rotor for receiving the treated material after it is discharged from the head and rotor.

3. A masticator comprising a rotor and a fixed head, having an opening through which material may be fed onto the rotor, said rotor and head having cooperating conical surfaces formed with cooperating spiral grooves to feed and masticate the material between the rotor and head, a pair of juxtaposed rings, one of said rings being fixed at the periphery of the rotor and the other at the periphery of the head and between which the masticated material is delivered, adjustable means for controlling the axial position of said rotor, means on the periphery of the rotor for receiving the treated material after it is passed between said rings, and means for removing the material from the rotor.

4. A masticator comprising a rotor journaled on a vertical axis and a head positioned above the rotor, said head providing a hopper on its upper surface having a delivery opening at its bottom, the under side of said head and the upper surface of said rotor being formed with cooperating conical surfaces having material feeding and masticating formations thereon, said delivery opening being arranged to deliver material from the hopper at the apexes of said conical surfaces, an annular tray on the periphery of said rotor for receiving the masticated material as it is discharged from between the head and rotor, and means for adjusting the relative axial positions of said head and rotor.

5. A masticator comprising a rotor journaled on a vertical axis and a head positioned above the rotor, said head providing a hopper on its upper surface having a delivery opening at its bottom, the under side of said head and the upper surface of said rotor being formed with cooperating conical surfaces having material feeding and masticating formations thereon, said delivery opening being arranged to deliver material from the hopper at the apexes of said conical surfaces, and an annular tray on the periphery of said rotor for receiving the masticated material as it is discharged from between the head and rotor.

6. A masticator comprising a rotor journaled on a vertical axis and a head positioned above the rotor, said head providing a hopper on its upper surface having a delivery opening at its bottom, the under side of said head and the upper surface of said rotor be-

ing formed with cooperating surfaces having material feeding and masticating formations thereon adapted to feed the material outwardly therebetween, said delivery opening being arranged to deliver material from the hopper at the center of said surfaces, and an annular tray on the periphery of said rotor for receiving the masticated material as it is discharged from between the head and rotor.

7. A masticator comprising a rotor journaled on a vertical axis and a head positioned above the rotor, said head providing a hopper on its upper surface having a delivery opening at its bottom, the under side of said head and the upper surface of said rotor being formed with cooperating surfaces having material feeding and masticating formations thereon adapted to feed the material outwardly therebetween, said delivery opening being arranged to deliver material from the hopper at the center of said surfaces, an annular tray on the periphery of said rotor for receiving the masticated material as it is discharged from between the head and rotor, and means for scraping material from said tray.

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