Sept. 5, 1939. M. ROCA ET AL 2,171,949

TRITURATING MACHINE

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Fig. 2.

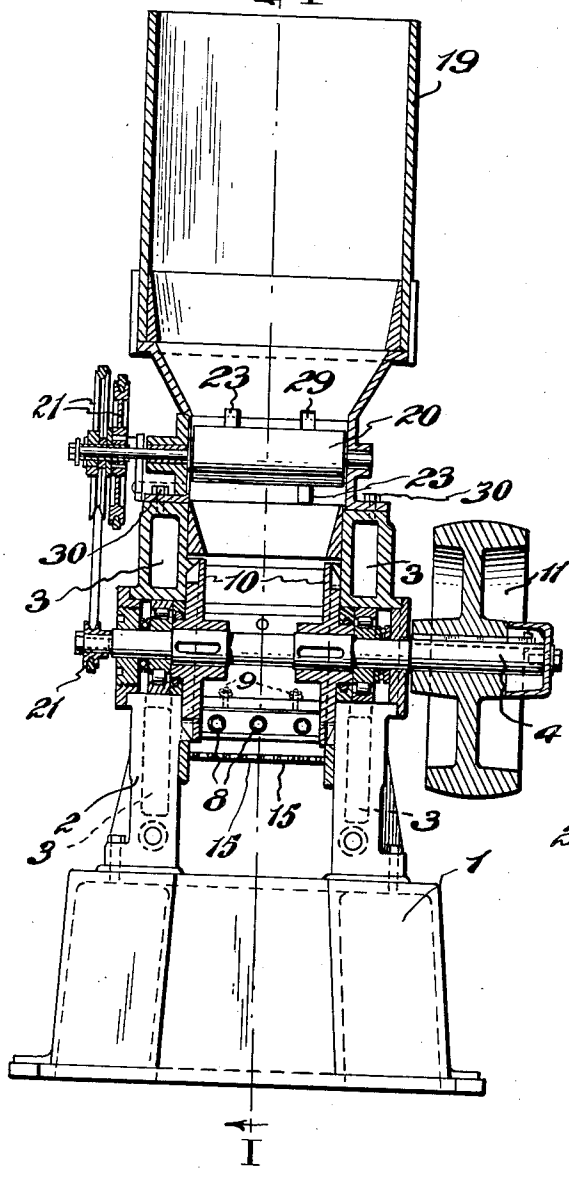
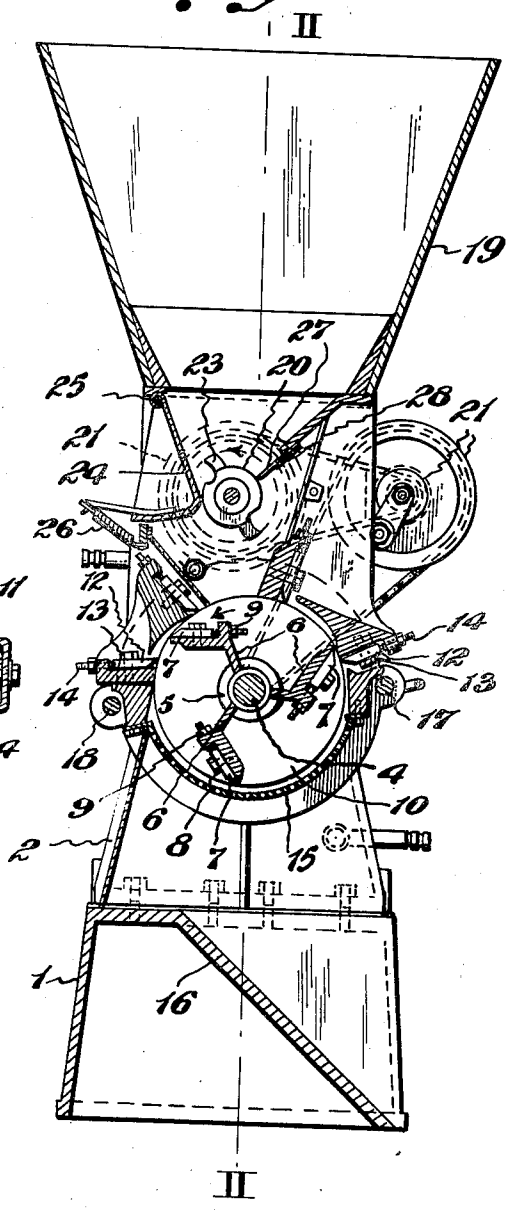


Fig. 1.



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TRITURATING MACHINE

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2 Claims. (Cl. 221—130)

This invention relates to machines for triturating waste india rubber and like materials, comprising a definite number of fixed knives and of knives arranged on a rotatable knife-carrying member in such a way that during the rotation of the member a cutting action is produced between the two sets of knives.

More particularly the invention relates to a novel feeding device for triturating machines of the type mentioned, which ensures perfect and regular functioning of the same, and a novel arrangement of the fixed knives in the machine, enabling them to be very quickly replaced, without it being necessary to dismount any part of the machine. Moreover special stops are provided in the rotary member, for the instantaneous adjustment of the knives.

A machine for triturating india rubber, provided with the improvements constituting the present invention, is illustrated by way of example in the accompanying drawing, in which

Figure 1 shows the machine in sectional elevation on the line I—I of Fig. 2; and

Figure 2 shows the same machine in sectional elevation on the line II—II of Figure 1.

In this drawing, 1 is the foot of the machine, and upon this foot rests the body 2 of the machine, preferably consisting in a known manner of a double-walled box, thus forming one or more chambers 3 through which cooling water can be caused to circulate. For this purpose the chamber or chambers 3 may be provided with suitable inlets and outlets for the cooling water. The body 2 of the machine supports approximately at its center a horizontal shaft 4, which revolves in suitable bearings, and supports in its inner part a knife-carrying member 5, which is virtually integral with it. This member, as will readily be gathered from the drawing, has three or more arms 6, each of which carries a knife 7, secured thereto by means of fixing screws 8, the position of the knives being adjustable by means of other screws 9. The knife-carrying member 5 has discs 10 on both sides, the object of which is to prevent particles of the material that is being disintegrated from penetrating to the bearings of the machine, for which purpose joints have also been provided in a known manner at suitable positions, a further object of the discs 10 being to facilitate the adjustment of the fixed knives, as will be hereinafter described. On a prolongation of the shaft 4 is mounted a flywheel 11, which serves at the same time as a driving pulley.

Around the knife-carrying member, and preferably at the upper middle part of the same, are arranged a certain number of fixed knives 12, mounted on the body of the machine by means of fixing screws 13 and adjusting screws 14, in such a manner that they are all readily accessible from the outside of the machine, to enable the knives to be replaced as promptly as possible without it being necessary to dismount any part of the machine. The adjustment of these fixed knives is also effected with great rapidity, owing to the lateral discs 10 of the aforementioned knife-carrying member, its periphery serving as a stop for the fixed knives, when they are being placed in their respective positions. The distribution of the fixed knives is such that in no case is a cut effected between more than one fixed knife and one rotating knife at the same time, the efficiency or output of the machine being thereby increased and the motive power required being reduced.

The comminuted material passes in a known manner through a semi-cylindrical perforated plate 15 in a downward direction, falling upon an inclined plane 16 at the foot of the machine, whence it can easily be collected. The perforated plate 15 is fixed by means of two pivots 17 and 18, one of which can easily be dismounted to enable the perforated plate 15 to be rocked when it is desired to empty the machine, or to give access to the interior of the same.

Above the box 2 is arranged a feed hopper 19, of any desired size, which guides the material that is to be triturated to the interior of the machine. For the purpose of obtaining regular feeding of the same there is arranged in the lower part of the hopper 19 a horizontal cylinder 20, which revolves in the direction indicated by an arrow in Figure 1, and which is actuated by means of a set of grooved pulleys 21 or other suitable transmission means from the main shaft 4 of the machine, the speed of rotation being at the same time reduced in a definite ratio. The cylinder 20 is provided with one, two or more claws or projections 23, which correspond to an equal number of covers 24, pivotally mounted about one and the same axis 25, and each pressing separately against the cylinder 20 under the action of a helical spring 26. 27 represents a plate fixed on hinges 28, which rests upon the cylinder 20, and which can be raised upwards, notches 29 being provided to allow the projections 23 to pass, the object of this plate being to prevent the passage of the material on this side of the cylinder.

The machine operates in the following manner:

The material that it is desired to disintegrate is placed in the interior of the feed hopper 19, coming to rest upon the feeding cylinder 20, the swinging lids 24 and the plate 27. This plate, owing to the weight of the material itself, remains pressed against the cylinder 20. During operation of the machine, the feeding cylinder 20 revolves at a definite speed, and the projections 23 thereon drag along with them some pieces of the material to be triturated, opening in turn at each revolution the covers 24, against the action of the springs 26, and thus permitting a predetermined quantity of material to pass. These swinging plates 24, owing to the springs 26, close again immediately after the passage of the cam-like projections 23. In order to effect the opening and closing of the pivoted covers 24 alternately at regular intervals, the projections 23 are distributed regularly round the periphery of the cylinder 20. When there are two projections, for example, they are preferably located in the same medial plane of the cylinder with an angular distance of 180 degrees between them.

The material that enters the interior of the machine falls on to the knife-carrying member 5, and owing to the rotation of the same the trituration of the various pieces is effected between the rotating knives 7 and the stationary knives 12. The fragments thus cut up come to rest upon the semi-cylindrical perforated plate 15, passing through the perforations if their size is smaller than that of the holes in the plate, while the pieces that are too large to pass through the perforations are carried round and cut again.

Owing to the feeding device described, the hopper 19 may be completely filled with the material to be triturated without any risk of over-feeding, such as might give rise to irregularities in the working of the machine, since the feeding cylinder 20, in conjunction with its cam-like projections 23 and the pivoted flaps 24, only allows a predetermined quantity of material to pass at each revolution, whether the hopper is full or not.

The machine provided with this feeding device serves in the first place to comminute pieces of india-rubber that are not very large, but in order that it may be possible to utilize this machine for the trituration of large pieces, the entire feeding device can readily be dismounted by unscrewing the screws 30 and substituting for it a smaller hopper by which the material is introduced, in which case, of course, the functioning is no longer automatic but requires supervision.

Finally it is to be noted that the special arrangement of the fixed knives, as previously described and as illustrated, more particularly in Figure 1, enables them to be quickly interchanged from the outside of the machine, without it being necessary to dismount any part of the latter, and the adjustment of the knives is effected instantaneously by merely pressing them lightly against the lateral walls 10 of the knife-carrying member, which serves as an abutment, when placing them in their respective positions.

What we claim is:

1. In a machine for triturating india rubber and like materials, a feed hopper to receive the material to be triturated, a rotatably mounted feeding cylinder normally closing the lower end of the feed hopper, pivoted flaps bearing against the peripheral surface of the feeding cylinder and each constituting part of one wall of the feed hopper, yieldable means pressing the pivoted flaps into contact with the feeding cylinder, cam-like projections on the peripheral surface of the feeding cylinder each adapted to push away one of the pivoted flaps during a part of each revolution of the feeding cylinder to allow a limited amount of material to fall from the hopper, the cam-like projections being so distributed over the periphery of the feeding cylinder that the pivoted flaps are opened in regular succession, a plate arranged with an edge thereof adjacent the periphery of the feeding cylinder and forming part of an opposite wall of the feed hopper, supporting means for said plate permitting the same to pivot in a direction opposite to the rotation of the feeding cylinder, and said plate having notches therein for the passage of the projections therethrough.

2. In a machine for triturating india rubber and like materials, a feed hopper to receive the material to be triturated, a rotatably mounted horizontal feeding cylinder normally closing the lower end of the feed hopper, means for transmitting power to the feeding cylinder, pivoted flaps bearing against the peripheral surface of the feeding cylinder and each constituting part of one wall of the feed hopper, springs pressing the pivoted flaps into contact with the feeding cylinder, cam-like projections on the peripheral surface of the feeding cylinder each adapted to push away one of the pivoted flaps during a part of each revolution of the feeding cylinder to allow a limited amount of material to fall from the hopper, the cam-like projections being equally distributed over the periphery of the feeding cylinder so that the pivoted flaps are opened in regular succession, a plate arranged with an edge thereof adjacent the periphery of the feeding cylinder and forming part of an opposite wall of the feed hopper, supporting means for said plate permitting the same to pivot in a direction opposite to the rotation of the feeding cylinder, and said plate having notches therein for the passage of the projections therethrough.

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