Feb. 19, 1929. 1,702,633

F. G. FEELEY

BEATER ROLL

Filed Jan. 26, 1928

Fig. 1.

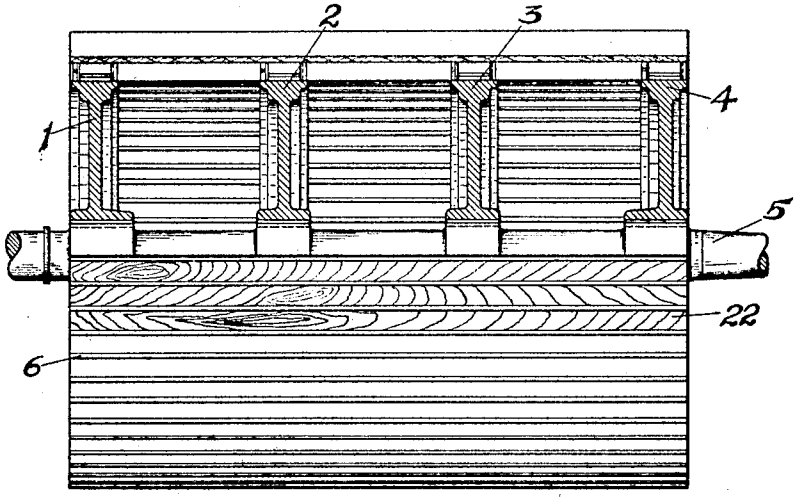


Fig. 2.

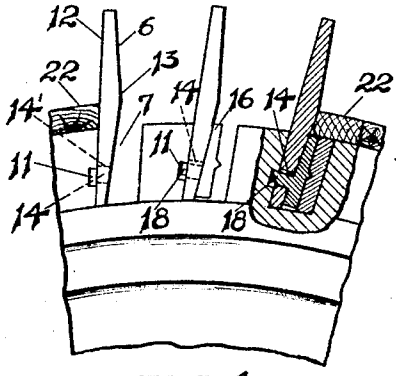


Fig. 3.

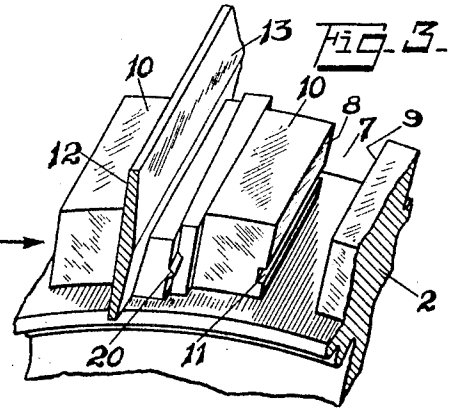


Fig. 4.

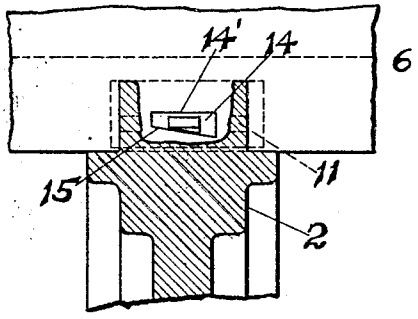


Fig. 5.

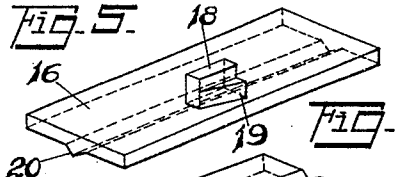
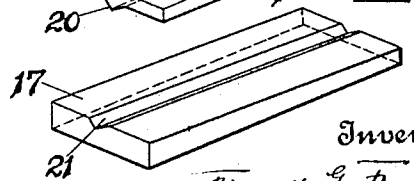


Fig. 6.



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UNITED STATES PATENT OFFICE.

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BEATER ROLL.

Application filed January 26, 1928. Serial No. 249,550.

This invention relates to certain improvements in beater rolls for washing, beating and refining engines used in the production or treatment of paper pulp, the improvement being designed especially for rolls of that class known in the art as bandless rolls.

These beater rolls comprise a carrier, either cylindrical or made up of a number of cylindrical heads or spiders, in which are formed slots for the reception of the grinding bars, by which the grinding function of the beater rolls is effected. In the operation of these rolls, if it becomes necessary to replace a grinding bar or bars for any reason, it is very desirable that such bar may be removed from the roll without the necessity of removing any of the other bars, or disturbing the fastenings of such other bars. Such beater rolls have been proposed in the art and are generally known as bandless rolls.

It is the especial object of the present invention to produce an improved roll of this type in which a construction of simple form has been provided for effecting the individual locking of the grinding bars in the rolls, the construction being such that the roll may be produced in a more economical way than the prior constructions, but one in which the bars are effectually locked in place.

With this and other objects not specifically referred to in view, the invention consists in certain novel parts, arrangements and combinations which will be described in connection with the accompanying drawings and the novel features pointed out in the claims hereunto annexed.

In these drawings,—

Figure 1 is a side view, partly in section, of the improved beater roll, the grinding bars being shown in position;

Figure 2 is a detail end view, partly in section and partly broken away, of the improved arrangement for locking the bars in place;

Figure 3 is a perspective view, on an enlarged scale, showing the mechanism;

Figure 4 is a detail sectional view, looking in the direction of arrow 4 of Figure 4, showing a part of the locking mechanism, and

Figures 5 and 6 are isometric views of two of the locking wedges that are employed for locking the grinding bars in place.

Referring now to these drawings, the beater roll includes a grinding bar support. Preferably, for lightness and simplicity of construction, this roll is made up of a plurality of spiders or heads, four such heads, marked 1, 2, 3 and 4 being shown, these heads being supported on a suitable shaft 5. These heads are provided, of course, in suitable numbers, depending on the width of the roll and the corresponding width of the grinding bars. In accordance with the invention, these heads are provided with a plurality of grooves, one such groove being provided for each of the grinding bars, which are indicated by the numeral 6. These grooves, which are indicated at 7, are formed so as to extend longitudinally of the heads, so that they can be readily produced in the heads without the necessity of any special machining. As illustrated, the walls 8, 9 of the grooves are formed parallel with each other, longitudinally and vertically of the roll, so that they can be readily cut without the necessity of special machining. In forming the grooves, blocks, indicated by the numeral 10, are formed between the grooves, and in one of the walls of the blocks, as for instance the wall 8, a longitudinal slot 11 is cut.

The grinding bars 6 are shown with a flat side 12 and a double bevelled side 13, as is generally used, but it will be understood that other shaped bars may be used within the invention. In the construction of the present application, however, the grinding bar, below the surface of the blocks and above the surface of the head, is formed with a slot or opening 14, which preferably is in the shape of a trapezoid, this opening extending entirely through the bar and being aligned with the notch 11 cut in the block, the bar being placed in the groove so that the flat side of the bar lies against the notched wall of the groove, as shown in Figures 2 and 3. This slot is formed with its top side 14′ parallel with the edge of the bar 6, the bottom of the slot being indicated at 15.

Cooperating with the bar are wedging devices for locking the bar in the groove. While these wedging devices may vary somewhat in construction, in the particular construction illustrated there are two wedges 16, 17, and the one of these wedges next to the bar will have one side tapered longitudinally and the other side shaped to conform to the shape of the bar. In the particular construction shown, however, where double bevelled bars are used, the wedge 16 tapers both longitudinally and vertically, whereas the wedge 17

tapers longitudinally only. The wedge 16 is formed with projecting surfaces, one of which, as 18, passes through the slot 14 and engages in the notch or groove 11, before referred to. Offset from the part 18 is a wedge shaped portion 19, the inclined face of which engages the inclined face 15 of the slot of the bar. Thus the wedge 16 locks the bar in position. Preferably, as shown, the wedge 16 is locked in position by the wedge 17, the wedge 16 having a rib 20 which engages a groove 21 cut in the wedge 17.

In assembling the roll, a bar is placed in position in its groove 7, and the wedge 16 placed in position with the projection 18 projecting through the hole 14 in the bar and entering the slot or notch 11. Wedge 16 is then driven endways to cause the wedge projection 19 to travel up the incline 15 of the slot in the bar, thus forcing the bar down to its seat in the head of the roll. Wedge 17 is then driven into place, thus locking the whole together, the rib 20 and the groove 21 of the wedges interlocking, thus preventing the wedge 17 from being displaced radially.

If desired, the usual wood fillers 22 may be provided between the bars, these being illustrated in Figures 1 and 2. Preferably, the wedges 16, 17 are made of non-corrosive material so as to prevent their being stuck together by rust and hindering the removal of the bars.

With the construction shown and described, it will be seen that a very simple locking mechanism for individually locking the bars in the rolls has been provided by the present invention, one in which no special machining of the roll is required, and one in which any bar may be readily removed from the roll without disturbing the other bars in any way.

While the invention has been shown and described in its preferred form, it will be understood that various changes may be made in the form and shape of the parts without departing from the invention as defined in the appended claims.

What I claim is:

1. A beating roll for refining engines and the like comprising a grinding bar support, longitudinal grooves in the support, the walls of which are parallel longitudinally and vertically of the roll, grinding bars seated in the grooves and provided with openings extending through the bars, locking members having projections extending through the openings and engaging the surfaces thereof, and means for holding the locking members in position.

2. A beating roll for refining engines and the like comprising a grinding bar support, longitudinal grooves in the support, the walls of which are parallel longitudinally and vertically of the roll, grinding bars seated in the grooves and provided with openings extending through the bars, locking members having projections extending through the openings and engaging the surfaces thereof, and locking wedges engaging the locking members.

3. A beating roll for refining engines and the like comprising a grinding bar support, longitudinal grooves in the support, grinding bars seated in the grooves, locking members tapering longitudinally and vertically in the grooves, and locking wedges tapering longitudinally and engaging the locking members.

4. A beating roll for refining engines and the like comprising a grinding bar support, longitudinal grooves in the support, grinding bars seated in the grooves and provided with recesses, locking members tapering longitudinally and vertically and having projections engaging the walls of the recesses, and locking wedges tapering longitudinally and engaging the locking members.

5. A beating roll for refining engines and the like comprising a grinding bar support, longitudinal grooves in the support, grinding bars seated in the grooves and provided with slots extending through the bars, said slots having inclined surfaces, locking members having projections extending through the slots and projections engaging the inclined surfaces of the slots, and locking wedges engaging the members.

6. A beating roll for refining engines and the like comprising a grinding bar support, longitudinal grooves in the support, one of the walls of each of said grooves being provided with a notch, grinding bars seated in the grooves and provided with slots extending through the bars, locking members having projections extending through the slots and entering the notches, projections engaging the surfaces of the slots, and locking wedges engaging the locking members.

7. A beating roll for refining engines and the like comprising a grinding bar support, grinding bars removably mounted in the support, and means for separately locking the bars in position, said means including a locking member tapering longitudinally and vertically and a locking wedge tapering longitudinally and engaging the locking member.

8. A beating roll for refining engines and the like comprising a grinding bar support, longitudinal grooves in the support, the walls of which are parallel longitudinally and vertically of the roll, grinding bars seating in the grooves and provided with openings extending through the bars, said openings having inclined surfaces, wedges having projections extending through the openings and inclined projections engaging the inclined surfaces of the openings, and means for holding the locking wedges in position.

9. A beating roll for refining engines and the like comprising a grinding bar support, longitudinal grooves in the support, the walls

of which are parallel longitudinally and vertically of the roll, grinding bars seating in the grooves and provided with openings extending through the bars, said openings having inclined surfaces, wedges having projections extending through the openings and inclined projections engaging the inclined surfaces of the openings, and locking wedges engaging the first named wedges for locking them in position.

10. A beating roll for refining engines and the like comprising a grinding bar support, longitudinal grooves in the support, the walls of which are parallel longitudinally and vertically of the roll, grinding bars seating in the grooves and provided with openings extending through the bars, said openings having inclined surfaces, wedges having projections extending through the openings and inclined projections engaging the inclined surfaces of the openings, a rib on the side of the wedges opposite the projections, and locking wedges having grooves cooperating with the rib.

11. Means for locking grinding bars in a beating roll including a wedge having a projection having an inclined face for engaging an inclined surface in the bar, said wedge being tapered longitudinally and vertically.

12. Means for locking grinding bars in a beating roll including a wedge having a projection having an inclined face for engaging an inclined surface in the bar, said wedge being tapered longitudinally and vertically and provided on the side opposite the projection with a locking rib.

13. A beating roll for refining engines and the like comprising a grinding bar support, longitudinal grooves in the support, grinding bars seated in the grooves, locking members having one side tapering longitudinally and the other side formed to conform with the shape of the adjacent face of the bar, and locking wedges tapering longitudinally and engaging the locking members.

14. Means for locking grinding bars in a beater roll including a wedge having a projection having an inclined face for engaging an inclined surface in the bar, said wedge being tapered longitudinally on one side and having its other side shaped to conform to the shape of the adjacent face of the bar.

15. Means for locking grinding bars in a beater roll including a wedge having a projection having an inclined face for engaging an inclined surface in the bar, said wedge being tapered longitudinally on one side and having its other side shaped to conform to the shape of the adjacent face of the bar, and provided on the side opposite the projection with a locking rib.

In testimony whereof, I have hereunto set my hand.

FRANK G. FEELEY.