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R. FETTERLEY

COMBINED MILL TEE AND STUFFING BOX

Filed July 29, 1920

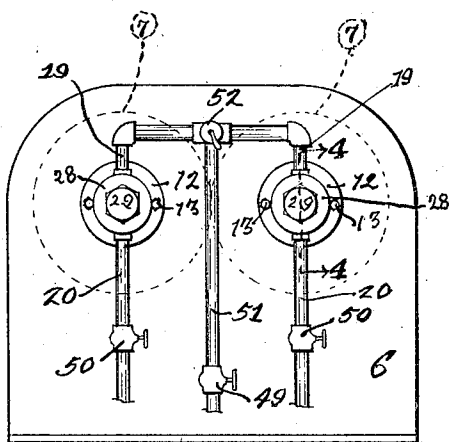


Fig. 1

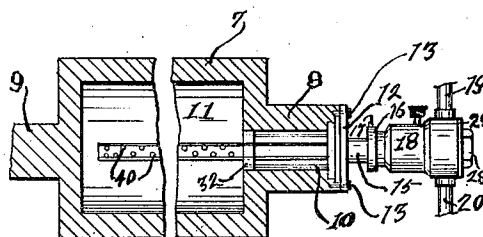


Fig. 2

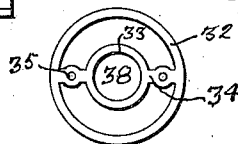


Fig. 3

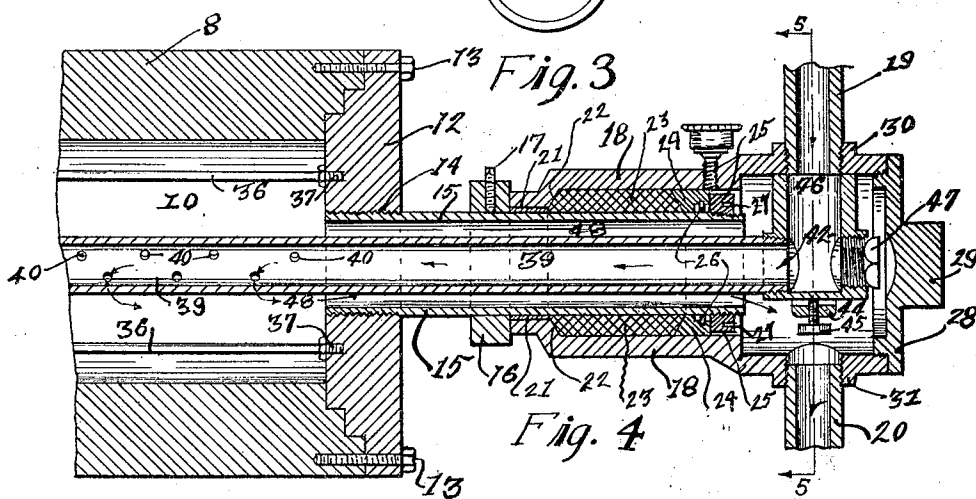


Fig. 4

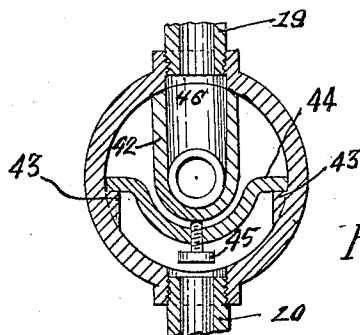


Fig. 5

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UNITED STATES PATENT OFFICE.

RALPH FETTERLEY, OF AKRON, OHIO.

COMBINED MILL TEE AND STUFFING BOX.

Application filed July 29, 1920. Serial No. 399,735.

To all whom it may concern:

Be it known that I, RALPH FETTERLEY, a citizen of the United States, residing at Akron, in the county of Summit and State of Ohio, have invented new and useful Improvements in Combined Mill Tees and Stuffing Boxes, of which the following is a specification.

This invention relates to new and useful improvements in mill tees and for the stuffing boxes therefor and has particular reference to a combined tee and stuffing box adapted to be used on rubber mills and the like wherein it is necessary or desirable to create a circulation of water within a mill roll for the purpose of either cooling or heating the same.

Objects of the invention are to provide a strong, durable device of the character above indicated which will be of simple, economical construction and which will be extremely efficient and reliable in use.

A particular object is to provide a mill tee construction wherein the pipe which carries the water into a mill roll may be quickly and easily removed therefrom and cleaned or a new pipe substituted without stopping the machine.

A further object is to provide a mill tee and a stuffing box therefor which when attached to the mill will provide a circulation of water through the mill rolls without leakage and which will be substantially noiseless in operation.

The above and additional objects are accomplished by the novel construction, combination and arrangement of parts herein-after described and illustrated in the accompanying drawing, in which I have shown a preferred embodiment of the invention, it being understood that the invention is capable of various adaptations and that changes and modifications may be made or substitutions resorted to which come within the scope of the claims hereunto appended.

In the drawings in which similar numerals of reference are used to designate corresponding parts throughout the several views, and in which,

Figure 1 is a side elevation of a portion of a rubber mill in which the rolls are indicated by dotted lines and particularly illustrating the manner of attaching thereto a device constructed in accordance with this invention.

Figure 2 is a central, vertical sectional

view of a mill roll having portions omitted and also showing my combined mill tee and stuffing box in side elevation and illustrating more clearly the manner of securing the same to the said roll.

Figure 3 is a plan view of one of the parts used in carrying out the invention.

Figure 4 is a central vertical sectional view taken as indicated by the line 4—4 of Figure 1 and showing a device constructed in accordance with this invention operatively attached to a mill roll, only a portion of the roll being shown.

Figure 5 is a vertical sectional view taken as indicated by the lines 5—5 of Figure 4.

Proceeding now to a detailed description of the invention, the numeral 6 is used to denote a mill frame and the numeral 7 denotes a mill roll. Two rolls 7 are usually employed in the ordinary mill as illustrated by the dotted lines in Figure 1. Each roll 7 is reduced in diameter at each end to provide a bearing or supporting portion which is ordinarily journaled in suitable bearings. This bearing portion is solid at one end and the driving gears are ordinarily secured directly thereto. The other end is hollow, being provided with a cylindrical cavity which communicates with the roll cavity. The end of the portion 8 terminates in a series of circumferentially disposed steps and is provided with a cover 12 which is secured thereto by the bolts 13 or other suitable means. The cover 12 is provided with a centrally positioned threaded bore 14 which is disposed therein coaxially with the roll 7. A tube 5 which is provided on each end with screw threads is screwed into the bore 14 so as to rotate with the rolls 7 on its axis. The threads in the tube 15 and in the bore 14 being either right or left hand, according to the desired direction of rotation of the roll 7 so that the tube 15 when screwed therein will not be unscrewed by the operation of the mill. A collar 16 is adjustably screwed to the tube 15 by the said screw 17 or other suitable means and a casing 18 is fitted over the said tube 15 so as to form a gland box and a support for the inlet pipe 19 and the outlet pipe 20. The bore in the casing 18 is reduced adjacent its inner end to provide the inclined shoulder 22 and so as to fit snugly on an annular bearing 21 which is fitted around the tube 15 so as to allow the said tube to rotate therein. The cavity of the casing 18 surrounding the tube 15 forms

a packing gland which is filled with suitable packing material 23 and a ring 24 is positioned around the tube 15 and against the packing material 23. The inner face of the ring 24 is inclined outwardly and the ring is forced against the packing material 23 by means of the collar 25 which is interiorly threaded and screwed upon the outwardly projecting end of the tube 15 so that the packing material 23 will be compacted between the inclined shoulder 22 and the inclined face of the ring 24 and forced into close contact with the outer surface of the tube 15. The inner portion of the ring 24 is cut away adjacent its outer lateral face and the said outer portion is provided on its inner circumferential face with a circumferentially extending groove 26 into which a tool may be inserted to remove the ring from the packing gland. The collar 25 is provided with a plurality of bores 27 which extend into the outer lateral side thereof so as to provide a seat for a tool or wrench which may be inserted therein for the purpose of screwing the collar 25 on to or removing it from the tube 15. The outer portion of the bore in the casing 18 is further enlarged and the casing is interiorly threaded to engage the threads of the exteriorly threaded cap 28 which is arranged to close the outer end of the casings. The cap 28 is provided with a centrally positioned outwardly protruding octagonal portion 29 adapted to be engaged by the jaws of a wrench for the purpose of screwing or unscrewing the cap 28 from said casing. A boss 30 extends upward from the top of the casing 18 adjacent its outer end and a similar boss 31 extends downwardly from the underside of said casing. Both of the bosses 30 and 31 are provided with a threaded bore and the inlet pipe 19 is screwed into the bore in the boss 30 and the outlet pipe 20 is similarly secured in the boss 31. A supporting member 32 is positioned in the cavity 10 in the reduced end 8 of the roll 7. The said member 32 comprises a hub 33 with spokes 34. The spokes 34 are provided with bores 35 into which the rods 36 are secured, the other ends of each rod being threaded and screwed into the threaded bores 37 in the cover 12.

The pipe 39 extends through the tube 15 with its exterior wall arranged in spaced concentric relation with the inner wall of said tube 15 and is extended through the opening 38 in the hub 33 at a point adjacent the other end of the roll cavity 11. The portion of the pipe 39 extending into the roll cavity is provided with a plurality of bores or openings 40 which extend through the wall thereof as shown in Figures 2 and 4. The outwardly projecting end of the pipe 39 is provided with a screw thread as hereinbefore set forth and a tee member 41 is screwed

thereon so that the stem of the member extends radially from said pipe and contacts with the interior surface of the wall of the casing. The casing is provided with lugs 43 which extend inwardly from the interior surface of the wall of said casing and a saddle 44 is positioned thereon. The saddle 44 is provided with a centrally positioned, vertical, threaded bore and a screw bolt 45 is operatively mounted therein so as to contact with the bottom of the tee 42 and force the stem 46 thereof into close contact with the upper wall of the casing. The tee 42 is positioned in said casing so that the bore in the stem 46 of the tee 42 coincides with the bore of the pipe 19. The other opening of the tee 42 is provided with a screw plug 47.

It will thus be seen that water may be forced through the pipe 19 so as to flow through the tee 42 and into the pipe 39 and be discharged through the bores or openings 40 into the cavity 11 and that the construction is such that a space or passage 48 is provided between the exterior surface of the wall of the pipe 39 and the interior surface of the wall of the tube 15 and that a constant stream of water can be made to flow from the pipe 19 through the pipe 39 into the cavity 11 and out through the space 48 to the discharge pipe 20.

In use, rubber mills of the type illustrated in Figure 1 are usually driven in series. The heavy pressure required and the friction of the rubber on the rolls create a great heat and it is necessary to produce a circulation of water through the cavity 11 in said rolls. This is done by connecting the pipe 51 to a source of water supply and operating the valve 49 in the pipe 51 and the valve 50 in the pipe 20. The bore in the pipe 39 or the bores 40 sometimes become clogged and interferes with the circulation of the water, in which case it is necessary, when an ordinary device is used, to stop the mill and in case the mills are connected in series to stop a series of mills and remove the feed pipe to be cleaned or replaced.

In using a device constructed in accordance with this invention, if the pipe 39 becomes clogged, the water is shut off without stopping the mill and the cover 29 and the screw plug 47 are removed and a brush is inserted into the bore of the pipe 39 and it may be quickly cleaned without stopping the mill. In case it cannot be cleaned in this way, the screw bolt 45 is operated to release the upward pressure on the tee 42 and the pipe 39 is taken out and cleaned or replaced as may be found necessary. The tee valve 52 is arranged on the supply line so that a greater supply of water may be directed into one cylinder and then into the other or the valve may be operated so that an equal amount of water may be directed into each roll or the water may be shut off from one roll entirely.

It will thus be seen that I have provided an improved device which may be operated with a minimum of friction and which may be easily and quickly cleaned without stopping the mill.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is:—

1. In a device of the class described, the combination with a mill roll having an enclosed cavity, of a tube coaxially secured thereto so as to extend outwardly therefrom with the bore of the tube communicating with said cavity, a casing surrounding the outwardly projecting portion of said tube, a packing gland in said casing, a supply pipe leading to said casing, an outlet leading therefrom, a pipe extending from said casing through said tube and into said roll, pipe supporting means in said roll, said means adapted to rotate with said roll about said pipe, a tee on the outer end of said pipe and means within said casing to detachably secure the stem of said tee against the wall of said casing with the bore in the tee communicating with the bore in said inlet pipe, substantially as and for the purpose herein set forth.

2. In a device of the class described, a

mill roll having an enclosed cavity therein, a tube rigidly secured to said roll so as to extend coaxially therefrom with the bore in the tube communicating with said cavity, a stationary casing around the outwardly projecting portion of said tube, the bore in said casing adjacent its inner end snugly fitting the said tube, the bore in said casing being enlarged to form a packing gland; means to compress packing material within said gland, the bore in said casing being further enlarged adjacent its outer end to form a fluid chamber, fluid inlet lines leading to said chamber, fluid outlet lines leading therefrom, a pipe having its outwardly projecting end detachably secured in said chamber and extending into said roll; means with the roll to hold said pipe coaxially therewith, said pipe provided on its outwardly projecting end with a pipe tee, the stem of which is detachably secured against the wall of said casing with the bore of said tee communicating with the bore in said inlet line, the bore in said casing being closed at its outer end with a cover detachably secured thereto.

In testimony whereof I have hereunto set my hand.

RALPH FETTERLEY.