United States Patent

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[54] **DEVICE FOR CLEANING THE BAFFLE WALLS OF BAFFLE CRUSHING MACHINES**
5 Claims, 2 Drawing Figs.

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[50] **Field of Search** 241/34, 37, 63, 64, 66, 166, 167, 186, 189

[56] **References Cited**
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ABSTRACT: A crusher with a rotor carrying crushing tools and with a baffle wall against which the material to be crushed is thrown, in which the baffle wall is at least in part movable toward said rotor to allow the crusher tools of said rotor to clean the baffle walls of deposits which have collected on said baffle wall. Automatic controls act, in response to a timer, to periodically throttle the material feed to the crusher while the baffle is automatically moved toward the rotor for the cleaning action.

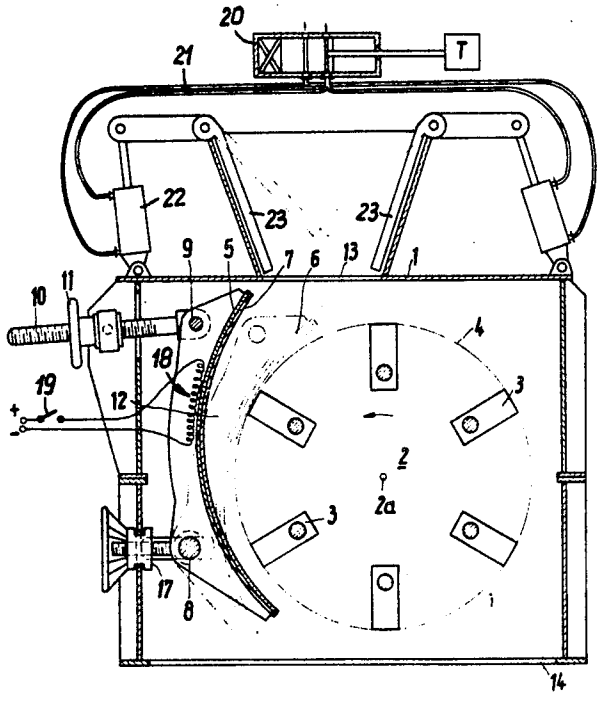


Fig. 1

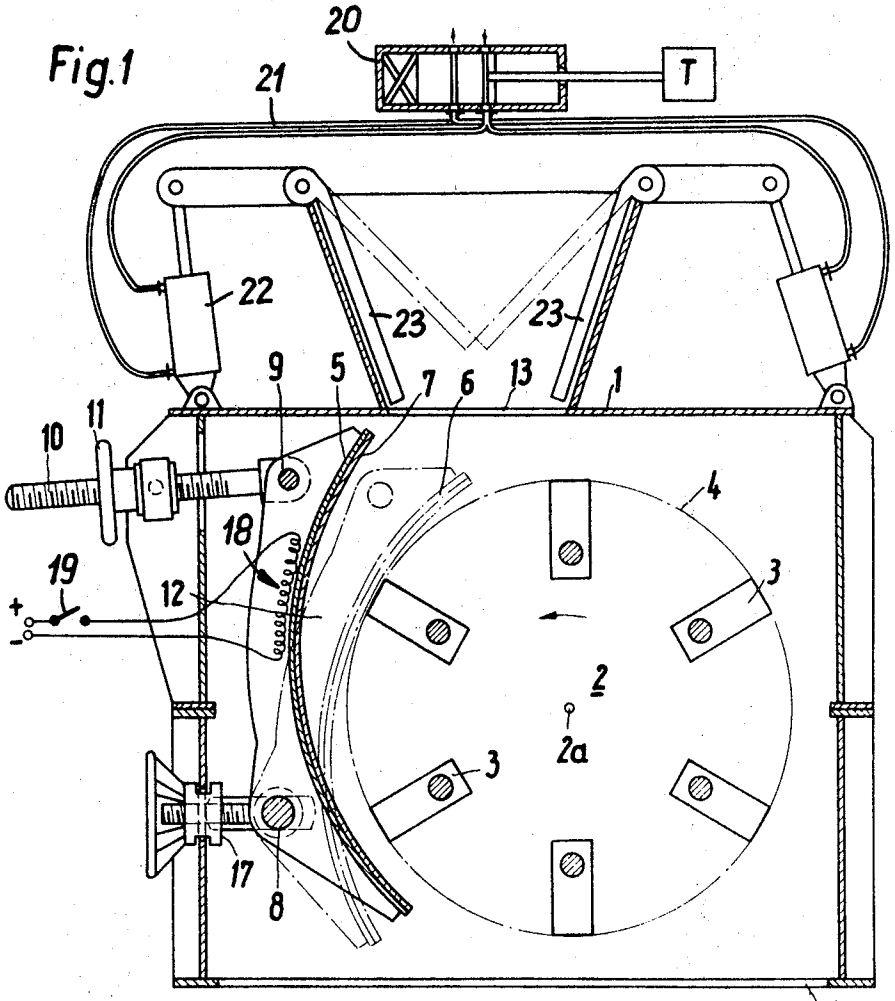
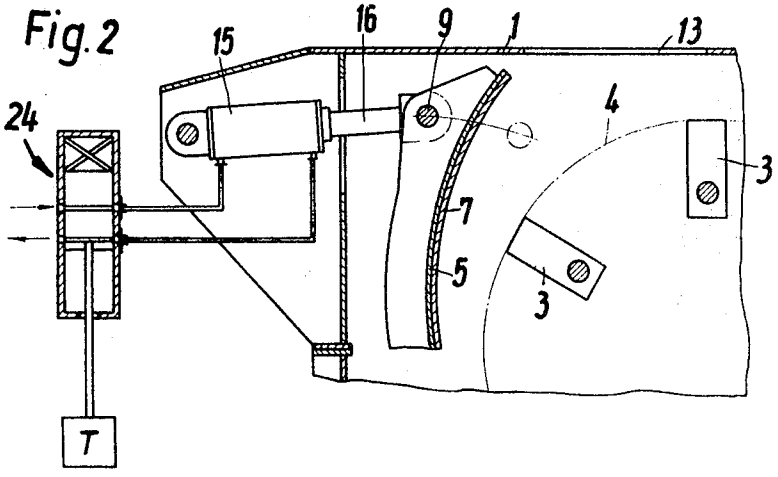


Fig. 2



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DEVICE FOR CLEANING THE BAFFLE WALLS OF BAFFLE CRUSHING MACHINES

The present invention relates to baffle crushing machines and method of cleaning the baffle walls of such machines. More specifically, the present invention concerns the cleaning of baffle walls from deposits in baffle crushing machines having a rotor rotating about a horizontal axis and equipped with crushing tools.

With baffle crushing machines of the above-mentioned type, particularly at the drawing-in range of the baffle walls, there exists the danger that deposits will collect and thereby will harmfully affect the drawing-in of the material to be crushed and consequently the output of the machine. In particular this danger is present with moist sticky or sticking material so that such baffle crushing machines may under certain circumstances even be completely clogged up. The tendency of the material to collect particularly at the drawing-in area of the baffle walls is increased in baffle crushing machines, such as hammer mills, beater mill, crushers, etc., due to the fact that the material to be crushed by the crushing tools is thrown against the baffle walls at high speed.

Heretofore it has been customary to remove the deposits on the baffle walls of such baffle crushing machines by stopping the machine and manually by means of a poker bar to scrape the deposited material off the baffle walls. Furthermore it has been attempted to clean the baffle walls from deposited material in baffle crushing machines by heating the baffle walls. In this way the deposited material is dried so that its sticking ability to the walls is reduced and a breaking off of the material from the walls is at least aided. This last-mentioned method is disadvantageous not only in view of the necessity of heating the walls but also due to the doubtful success.

Finally, baffle crushing machines have become known in which the cleaning of the baffle walls from deposited material is brought about by designing the impact walls as part of a continuously rotating plate band so that the material deposited on said band will break off at the areas where the band is reversed while a portion of the deposited material is scraped off outside the working chamber. Aside from the fact that such an arrangement requires a rather expensive construction, it is also disadvantageous due to the fact that the plate band cannot be guided in a way suitable for the crushing operation and, moreover, is subjected to rapid wear.

It is, therefore, an object of the present invention to overcome the above-mentioned drawbacks.

It is another object of this invention to provide a method of and design a device for cleaning the baffle walls of baffle crushing machines which is of low cost and requires a minimum of time for each individual cleaning operation.

It is another object of this invention to provide a device and method as set forth in the preceding paragraph, which will permit giving the baffle walls a shape which is most favorable for the crushing operation.

These and other objects and advantages of the invention will appear more clearly from the following specification in connection with the accompanying drawing, in which:

FIG. 1 represents a vertical section through a crushing machine according to the present invention which is designed for cleaning the baffle walls by hand.

FIG. 2 is a portion of a corresponding vertical section through a machine according to the invention which is intended for cleaning the baffle walls by means of a power operable device.

The invention is seen primarily in that temporarily for a brief period of time the supply of material to be crushed is throttled or interrupted while the baffle walls or at least those portions thereof which are located within the drawing-in range of the machine and where the material may collect, are moved toward the circulatory path of the crushing tools but up to a safe distance therefrom only, and then are returned to the normal baffle wall position whereupon the supply of material is again continued. The cleaning operation occurs during the approaching movement of the baffle walls toward the circulatory path of the rotating crushing tools while overloading the machine can be avoided by suitably selecting the speed of approach of the baffle walls toward the circulatory path of the crushing tools. Each such cleaning operation can be effected either by hand or by means of adjusting spindles operated by a handwheel or purely mechanically. Moreover, the cleaning may be effected automatically by means of a control mechanism which controls the supply of the material and actuates the adjustment of the baffle walls. This operation can be initiated in predetermined time intervals by means of timer mechanisms.

Especially when very moist material is involved, for instance lime containing soft coal, the cleaning may be aided by heating the baffle walls.

The method according to the present invention may be realized in a particularly simple manner by effecting the feeding movement and return movement of a baffle wall by pivoting the same about an axis which is parallel to the axis of rotation of the rotor of the baffle crushing machine. However, also other possibilities of feeding and withdrawing the baffle walls are possible and within the ambit of the present invention.

A particularly advantageous baffle crushing machine for carrying out the method according to the invention consists in that the pivot axis of the baffle wall is arranged on that side of the baffle wall which faces away from the rotor and is located within the area of the lower portion of the baffle wall. The point of attack of the adjusting may coincide with said pivot axis, said adjusting device serving for adjusting the width of the gap at the lower end of the baffle wall for limiting the granular size of the material being discharged.

The location of the axis of rotation of the baffle wall and the shape thereof are always so to be selected that within the area in which the material will collect, in particular on the baffle wall, the baffle wall can be moved or fed toward the circulator path of the rotating crushing tools so as to remain a safe distance therefrom, whereas the remaining areas of the baffle wall must not enter said circulatory path. The danger of a collision of the baffle wall with the circulating or rotating crushing tools exists primarily in the intermediate area of the baffle wall when the latter, in vertical section, has the shape of a circular segmental arc with a radius which differs only slightly from the radius of said circulatory path. When the axis of rotation of the baffle wall is located on that side which faces away from the rotor and is arranged within the area of the lower portion of the baffle wall, according to the invention, the baffle wall may, in order to avoid the above-mentioned danger, have a parabolic shape in vertical section, the radius of curvature of which within the area of the zenith located above said axis of rotation is slightly less than the radius of the circulatory path.

Referring now to the drawing in detail, the machine disclosed therein comprises a housing 1 in which a rotor 2 is rotatably journaled for rotation about a horizontal axis 2*a*. Pivotally supported by rotor 2 are hammers 3 which determine the circulatory path 4. The baffle wall 5 is covered with wear-resistant plates 7 and is pivotable about a pivot shaft 8. An adjusting device 17 for adjusting the width of the bight or gap between the circulatory path 4 and the lower end of the baffle wall 5 is connected to the pivot shaft 8. The full line position of the baffle wall 5 indicates the baffle position, whereas the baffle wall position 6 shown in dot-dash lines indicates the end position during the cleaning of the baffle wall. The adjusting device for the baffle wall 5 for purpose of cleaning, is operatively connected to a bolt 9. The supply of material is effected through the openings 13 in the housing 1 from where the material passes through the grinding chamber 12 to the discharge opening 14.

According to the embodiment shown in FIG. 1, a spindle 10 is pivotally connected to the bolt 9 and is adapted to be actuated by a spindle nut pivotally journaled in housing 1 and operable by a handwheel 11.

FIG. 1 also shows a heating device 18 adjacent the wall 5 for selectively heating the latter by closing switch 19, to aid the

cleaning of wall **5** by the hammers **3**. Furthermore, a timer T is provided which at set time intervals may actuate a hydraulic system **20**, **21** and **22** to close flaps **23** to thereby temporarily close off the inlet **13** so that during this period after adjustment of wall **5**, the latter may be cleaned.

The device according to FIG. **2** is very similar to that of FIG. **1** with the exception that the piston rod **16** of a cylinder piston unit **15** is connected to the bolt **9**. The cylinder piston unit **25** is in turn controlled by a timer T1 which controls a valve **24**.

It is, of course, to be understood that the invention as set forth above has been described in connection with a possible embodiment of the invention only and that the showing in the drawing is of a mere explanatory character and is not limiting the invention the scope of which is determined by the claims appended hereto.

I claim:

1. In combination with a crusher having housing means with inlet means and also having a rotor located within said housing means and equipped with crushing tools pivotally connected thereto for crushing the material admitted into said housing means through said inlet means: baffle wall means arranged within said housing means so as to face a portion of the periphery of said rotor while a portion of said baffle wall means is located near said inlet means, first control means for selectively controlling said inlet means, second control means operatively connected to said baffle wall means for reducing the distance between at least a portion of said baffle wall means and said rotor to cause said tools to clean said baffle wall means of deposits thereon, automatic means operatively connected to said first and second control means and operable at a desired time to cause said first control means temporarily to throttle said inlet means and to cause said second control means temporarily to reduce the distance between at least a portion of said baffle wall means and said rotor, and timer means adapted to be set for initiating operation of said automatic control means at set time intervals.

2. An arrangement in combination according to claim **1**, which includes heating means for heating said baffle wall means.

3. An arrangement in combination according to claim **1**, which includes: shaft means substantially parallel to the axis of rotation of said rotor and pivotally supporting said baffle wall means, said second control means being operable to tilt said baffle wall means about the axis of said shaft means.

4. An arrangement in combination according to claim **3**, in which said shaft means is located on that side of said baffle wall-means which faces away from said rotor and near the lower portion of said baffle wall means.

5. An arrangement in combination according to claim **3**, in which that surface of said baffle wall means which faces toward said rotor follows approximately a cross section having the contour of a parabola the radius of curvature of which within the area of the zenith portion above said shaft means approximately is less than the radius of the circular path described by the outer end of said crushing tools.