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(54) Title: Axial Flow Percussion Mill

(57) Abstract: Axial flow percussion mill which crushes material having a size to 300mm in which the percussion box consists of three anvils on which impinge three hammers which are raised by a rotating cam which with each revolution drop twice the hammers upon the respective anvil. The three percussion hammers and their respective anvils lie in the percussion box in the axial plane of the cam shaft. The hammers used have a weight from 200kg to 700kg. The material to be crushed is fed together with a water stream at one end of the percussion box and the material axially migrates from one anvil to the other by splash and random movement. A limiting screen is surrounding the third anvil on three sides and the material which has attained the right size passes through the screen to form the final product. Ore with a size, upon approximately 75mm is fed together with a water stream at a rate of 6.6 cubic metres per ton. The hammers have a weight of 230kg and drop 96 to 114 times per minute. The limiting screen has apertures of 0.69mm so that the reduction ratio obtained is 100 times.

(56) Documents cited: SU 67502

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AXIAL FLOW PERCUSSION MILL

The invention concerns a device for the size reduction of mined ore, rock or other material.

The invention concerns an axial flow percussion mill which can crush material having a size up to 300mm. It is highly efficient and it can reduce the size of ore to a final size of 0.69mm from 75mm which is a reduction ratio of 100 times.

The device of the present invention consists of a percussion box which contains three percussion anvils and hammers. The three percussion hammers impinge directly on the three percussion anvils and are raised by means of a rotating cam. The profile of the cam is such that with each revolution of the cam the percussion hammers fall twice upon the anvil. The three percussion hammers and their respective anvils lie in the percussion box in the axial plane of the cam shaft. The hammers can weigh from 150kg up to 700kg.

Material to be crushed together with a water stream are fed at one end of the percussion box where it is impinged upon and crushed by the first hammer.

Material crushed, either partially or wholly, between the first hammer and anvil then axially migrates by splash and random movement to the second anvil where the process of size reduction is taken further by the impingement of the second hammer on the second anvil.

Material, further crushed between the second hammer and second anvil, migrates by splash and random movement to the third anvil where it is impinged upon by the third hammer and crushed further.

The crushed material splashes against a limiting screen which surrounds the third anvil on three sides. The material which has attained the limiting screen size passes through the screen to form the final product. The rate of tonnage crushed will depend on the material to be crushed. For example, if schist has to be crushed a production of 7 tonnes per 24 hours can be

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METHOD OF OPERATION

Ore up to 75mm is fed into the end of the axial flow percussion mill at the rate of 5 tons per 24 hours. A water stream is fed together with the ore at the rate of 33 cubic metres per 24 hours. The hammers, weighing 230kg each impinge on the ore as it migrates from the first anvil to the final anvil. The ore then splashes against the screen surrounding the final anvil. This screen has an aperture of 0,69mm. The hammers drop upon the anvils at the rate of 96 to 114 drops per minute for each hammer and anvil set.

CLAIMS

1. A device for the size reduction of material by percussion characterized that the percussion box consists of three anvils on which impinge directly three hammers which are raised by means of a rotating cam and that the three percussion hammers and their respective anvils lie in the percussion box in the axial plane of the cam shaft.
2. A process for the size reduction of material by using the device according to claim 1 characterized that the material to be crushed is fed together with a water stream at one end of the percussion box and that the material axially migrates from one anvil to the other by splash and random movement.
3. A process according to claim 2 characterized that a limiting screen is surrounding the third anvil on three sides and that the material which has attained the right size passes through the screen to form the final product.
4. An axial flow percussion mill according to claim 1 in which with each revolution of the cam the percussion hammers fall twice upon the respective anvil.
5. An axial flow percussion mill according to claims 1 to 4 characterized that the hammers weigh between 150kg and

700kg ✓/

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700kg.

6. A process for the crushing of ore with the axial flow percussion mill according to claims 1 to 4 in which the ore has a size of about 75mm, ~~the water~~ ^{approximately} stream fed together with the ore is at a rate of ^{1.6} cubic metres per ton, the hammers weigh 230kg and drop 96 to 114 times per minute and the limiting screen has apertures of 0.69mm so that the reduction ratio obtained is 100 times.

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