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Safe Cavity Filling

Dump Truck with Push-Wall and Rock-Backfill Slinger

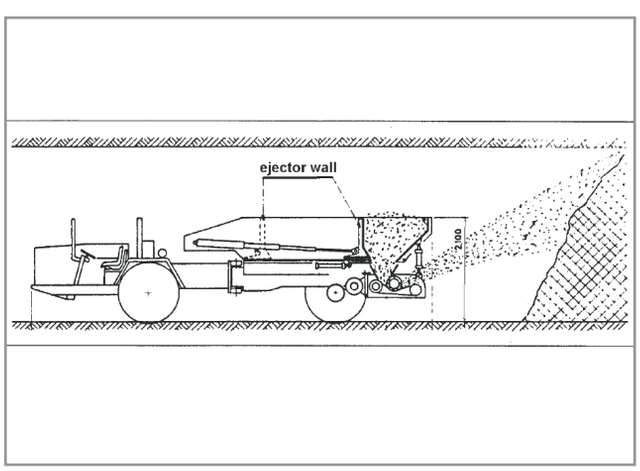
Description of the System

For filling gaps with backfilling material in the sector of pillar-chamber mining and for filling residual gaps with regards to the storage of industrial waste products in the sector of underground storage technology, various backfilling procedures are applied. Besides pump backfill, pneumatic backfill and tipping backfill, the slinger backfill has proven to be a cost-saving alternative. There are two possible ways of application for the backfill slinger:

- stationary use of the backfill slinger, i.e. fix position on the track, loading via conveyor belt or loader;
- mobile use of the backfill slinger, mounted to a push-wall dump truck, loading via push-wall skip.

In the following, we will have a look on the mobile use of the backfill slinger. The advantage of the system is that the backfilling material can be transported to the different places of work by means of a dump truck and brought in place by a rockbackfill slinger from a central depot or a roller.

By spraying, a binding agent like grout or lime solution (flue dust) can be added to the backfill rock in an easy procedure performed on the vehicle in order to increase the strength of the backfilling material put in place. The mixing with the backfilling material is effected while driving and in slinger operation.



Operational Description

Dump Truck Paus PMKS VS

Dump Truck

The dump truck has a firmly mounted skip with a push-wall that can be moved hydraulically for discharge in the back of the vehicle. Discharge can be done in one continuous working process by means of a hydraulically operated rear cover for opening and closing the rear end of the pushwall skip. This makes a complete dump truck without having the effect that the skip enlarges the vehicle height when dumping out.

Emptying the skip is mainly done through a hatch and the rock-backfill slinger mounted underneath which ejects the backfill material due to the slinging action. The push-wall in the skip is moved in longitudinal direction of the vehicle to the end of the skip by means of a double-acting hydraulic cylinder and can also be moved back to its initial position. The push-wall is provided with stable guides running in corresponding rails located on the skip bottom and on the skip walls. At the rear end, the skip has a hatch with sliding shutter which can be opened and closed by means of a hydraulic cylinder.

Rock-Backfilling Slinger

The rock-backfill slinger consists of a fast running, short conveyor belt. The conveyor belt – with a driving pulley, a guide pulley with clamping device and a cell-wheel centrifugal drum – is mounted in a machine frame. In addition, two side guide rollers guarantee straight running. The conveyor belt is driven by a hydraulic motor or by an electro motor.

The rock-backfill slinger is fixed under the skip bottom by means of a turntable in central position under the hatch and the discharge funnel. By this, the feed funnel as well is in central position under the hatch with every swivelling and rotating movement so that there is only minimum loss of material while dumping. The Cardanic suspension of the rock-backfill slinger is positioned underneath the skip bottom. It can be turned to the side for +/- 550 by a hydraulic cylinder and by two other hydraulic cylinders it can be swivelled up and down for 30°.

Working Operation

For the operation of the rock-backfill slinger you have to observe the recognized safety regulations. The operator's panel is designed in a way that the driver always has free view to skip and backfilling range.

- The vehicle must be positioned in a way that the backfill material hits the wall, while still being in upward shot.
- Start backfill slinger and drive it up to normal speed.
- Slightly open the hatch by means of the operating lever to allow that the backfill material is slowly passed on to the backfill slinger. Overstressing of the backfill slinger occurs in case of an evident engine-speed decrease and can be avoided by closing the hatch and moving back the push-wall.
- Turn the backfill slinger into the desired direction of ejection.
- If the backfill slinger is running empty, go on actuating the push-wall until a flow of material is ejected continuously.

Due to the rotating and swivelling rock-backfill slinger a large range can lightly be covered with backfill material so that optimum solidification and hardening by means of the cementing agent is ensured.

TypenblattnNummer Änderungn vorbehalten. Abbildungen z.T. mit Sonderausstattungen

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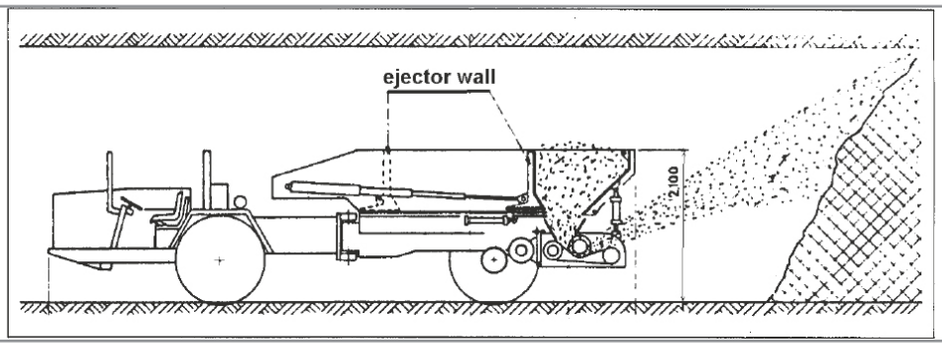
Technical Data

Dump Truck Paus PMKS VS



Technical Data

Belt speed	20 m/s
Width of belt: mobile rock-backfilling slinger plants	up to 500 mm
stationary rock-backfilling slinger plants	up to 600 mm
Conveying capacity	50 to 60 m^3/h
Range of ejection depending on grain size	up to 50 m
Height of ejection	up to 10 m
Lateral spread	up to 70 m

Specification of Material

Specific weight	specific weight should be > 1
Consistency	dry / low water content, slinging of material with flowability is not possible
Backfill rock	Grain size: 0 mm bis 50 mm
cementing agent fluidized-bed ashes	50 kg per m^3 Backfill rock 100 kg per m^3 Backfill rock
Salt	Grain size: 0 mm to 50 mm, dust portion should be as low as possible, as ejecting of dust is only possible under certain circumstances
Adding of cementing agent	non

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