EXCHANGE OF EXPERIENCE

EXTENDING THE SERVICE LIFE OF DUMPER BELTS

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Opencasting at the mines of Chasov Yar Combine is carried out by means of an RV-1 rotary excavator and an OSh-1 walking dumper first used in 1956 as follows: the charge is unloaded from the buckets of the rotor to a receiving conveyer and from there transmitted to the conveyer of the rotory excavator to be delivered to the bin of the walking dumper (see Fig. 1).

In order to avoid waste, aprons, made of a vulcanized conveyer belt, were installed in the receiving bin. The aprons closely adhered to the dumper belt; the belt wore by 150 to 200 mm on each side.

As a result of the wear of the upper part the belt had to be discarded within 10 to 12 weeks. In order to extend the service life of the conveyer belt, K.A. Myshkin proposed the installation of a belt feeder in the hopper (in 1959). The feeders were manufactured according to the drawings of the designing office at the Mining Administration and arranged in three OSh-1 dumpers. Characteristics of the feeder: total length: 7 m; drive drum diameter: 630 mm; diameter of the reel drum 430 mm; speed of belt movement: 2.8 m/sec; width of belt: 1400 mm; distance between upper roller bearing: 450 mm; angle of inclination of side rollers 30°.

After the introduction of the feeder the charge from the distributor of the excavator was directly delivered to the feeder belt from where it was transported to the conveyer of the walking dumper.

By using the feeder, the charge is dropped from a much shorter distance prolonging the service life of the belt by 5 to 6 months. Just the same, the feeder belt only served 15 to 20 days. In the course of the season the length of the worn feeder belt exceeded the total length of the conveyer belt. The heavy wear was due to the slipping of the belt from the drive and reel drums. The slipping occured due to changing unloading areas.

In order to economize on the vulcanized belt, A.S. Kryuchkov changed the design of the tail end of the receiving console and of the dumper hopper and eliminated the belt feeder. Instead of a three-roll bearing a four-roll

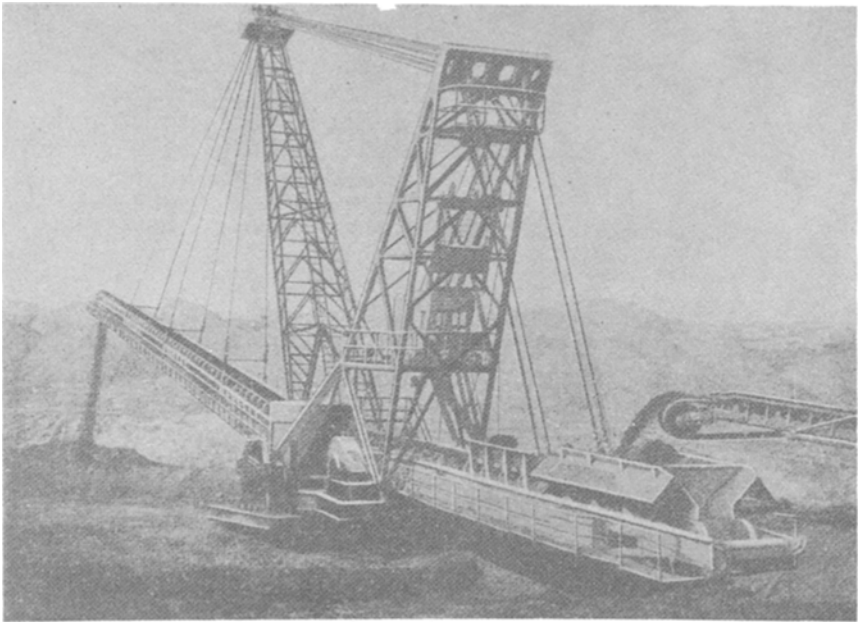

Fig. 1. Walking OSh-1 Dumper.

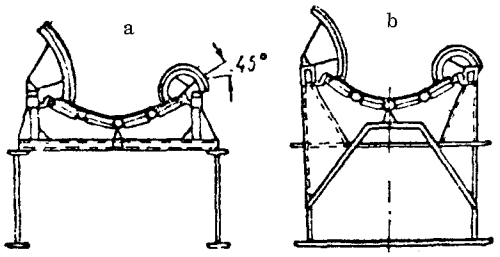

Fig. 2. Four-roller bearings:
(a) bracket frame, rectangular;
(b) same, trapezoidal

bearing with a 45° angle of inclination of the outside rolls was installed in the hopper of the conveyer (see Fig. 2). The design of the hopper wall underwent substantial changes. Both walls are oval; the height of one wall is half of the other in order to decrease the dumping distance (see Fig. 3). Aprons are no longer used.

The new shape provides the bracket with two side ribs at a 60° angle allowing the sand to roll off. Therefore, it is no longer necessary to remove the sand from under the moving belt by hand, the conveyer works much better and belt life is greatly extended.

Only one walking dumper in the Severnaya Yugostal' was left with a belt feeder because working conditions are easier on the feeder than in other areas. The Osh-1 dumper of Severnaya Yugostal' mine is set up near the mine. The rock is delivered to the belt feeder from an St-8 automatic reloader. Characteristics of the reloader: productivity — 600 m^3/hour; belt width: 1200 mm; belt movement: 3 m/second length of conveyer bracket 24 m; angle of lift of the conveyer — 16°; height of dumping; 6.4 m; rate of movement: 0.6 km/hour; the reloader can be turned around. Since all units are stationary in that area, the charge always hits the same spot on the feeder belt so that the belt works regularly. Under these conditions the feeder life lasts throughout one season. In 1960 about 800,000 m^3 rock was transported by the belt feeder and the belt "mileage" running over 95,000 km. The con-

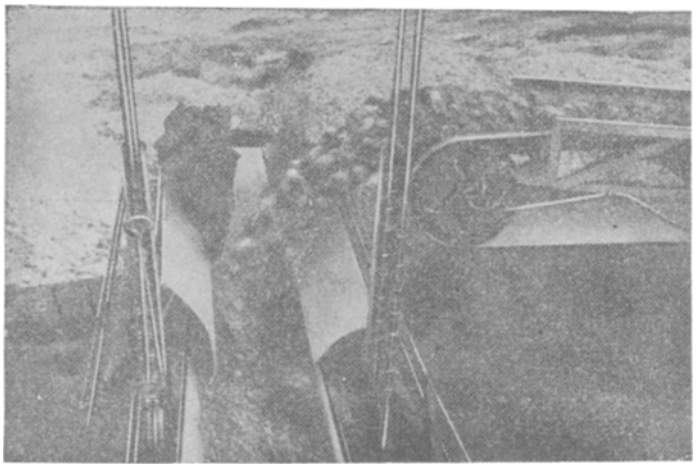

Fig. 3. Receiving hopper of dumper.

To prevent spilling of the charge, the hopper width was decreased from 1000 to 800 mm above the belt (belt width: 1200 mm). A 15 to 20 mm gap was left between the belt and the walls of the hopper. The new design (see Fig. 2) greatly differs from the original three-roller system. The rollers are coupled by means of hinges (see Fig. 2). The spinning axis of the four rolls is rigidly fastened in three spots. The free movement of the hinges absorbs the dumping shock which results in longer service life of the roller bearings and the belt. The cross-section of the receiving bracket was changed from rectangular to trapezoidal (see Fig. 2). Originally, sand would accumulate between the roller bearings impeding their movement. It was difficult to remove that sand.

ditions of the belt is still satisfactory and it is suitable for use the fourth season.

CONCLUSIONS

In view of the complex work of a rotary excavator and a walking dumper, the design of the roller bearings and the receiving hopper of the dumper are greatly affected by unloading conditions and the location of spinning axis of the distributor of the rotary excavator.

With dumping of the charge regularly on one spot, belt feeders are satisfactory and ensure a long service life of the belt.

FOR A CLEANER ATMOSPHERE

In shop Nr 4 of Chasov Yar Combine two dust removers with meshed filters were installed[1]. The efficiency of the mesh filter is 0.96. The clay and grog dust is re-used in the production of slip. In view of the satisfactory performance of the two installations, the plant intends to equip the flue gas pipes of the dryers with the same same type of filters as well as the exhaust fans of presses used for the semi-dry method, feeders, elevator heads and ground clay and grog bins.

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[1] I.P. Vas'kov, Ogneupory, 1961, Nr 2.

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At Kransyy Oktyabr' Refractory Plant in Konstantinovka, flue gas from dryers is purified by means of installation designed by M.P. Dovnar[1]. A blade shaft whirls up the dust particles that settle in the tank and the suspension is repumped for further use; then the tank is refilled with clean water. These dust removers are installed in all drying drums. With a proper operation of the unit, the degree of purification amounts to about 98%.

A.L. LIMANSKAYA,
Krasnyy Oktyabr'
Refractory Plant in
Konstantinovka

[1] M.P. Dovnar, Ogneupory, 1958, Nr 4.

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NEWS IN BRIEF

MODERN METHODS OF REFRACTORY TESTING AND CONTROL

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In recent years the volume of production and the variety of goods have been greatly expanded at Semiluki Refractory Plant. The increasing variety of service calls upon workers and researchers alike to devise methods for the rapid and exact determination of the suitability of refractories under specified working conditions. It goes without saying, that the methods must be adjusted to the peculiarities of a given plant. It is the feeling of the authors that this problem has been insufficiently considered in the current all-union specifications for test methods.

Frequently, too few samples serve for the determination of physical and chemical properties, giving a incomplete picture.

The standard testing methods for refractory articles are often time-consuming and laborious. It also happens that specific working conditions are not considered.

By way of example we refer to the "Volumetric Test for After-Shrinkage or Expansion," (State Standards 5402-50) and "Test for Thermal Stability of Refractory Goods at a Temperature of 1300° C" (State Standards 7875-56). The authors of these State Standards tried to approximate the testing method to the service conditions; however, in both cases the testing time is doubled or even tripled and the methods made more complex. Moreover,

[1] M.N. Blubshteyn, Ogneupory, 1960, Nr 12.