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DEVICE FOR REMOVING FOREIGN MATTER FROM BELTS

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Fig. 1.

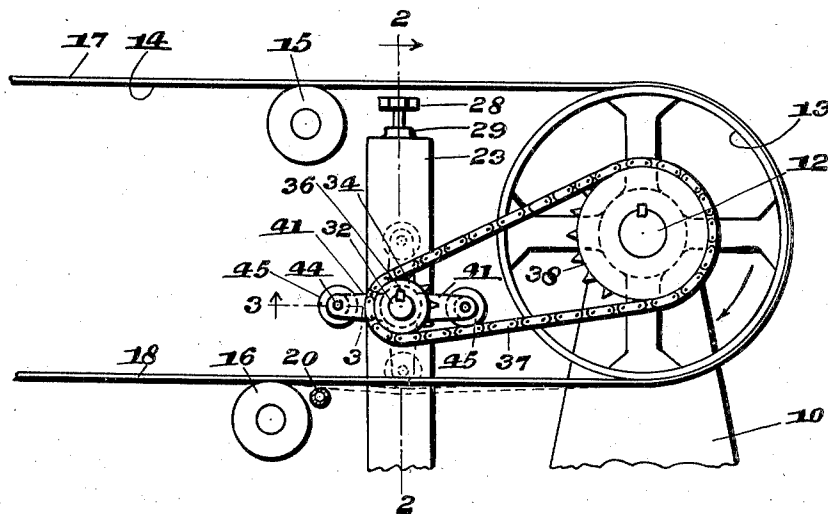


Fig. 2.

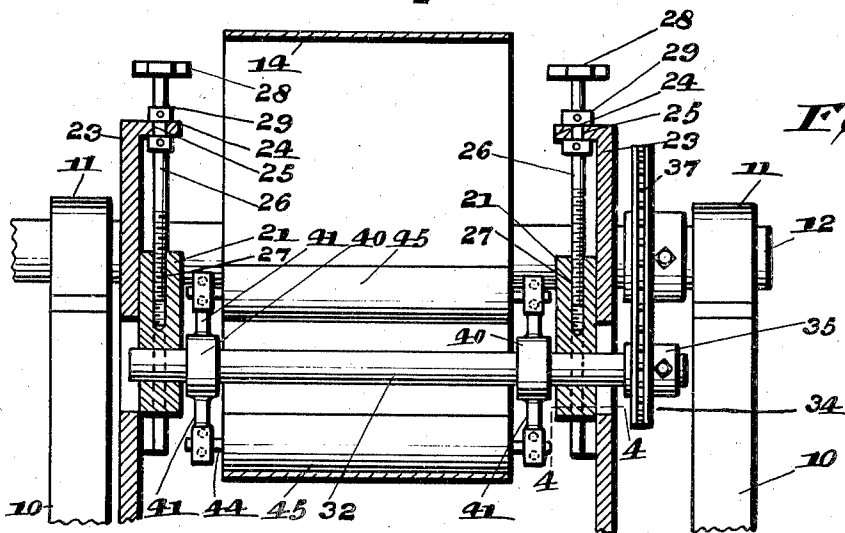


Fig. 4.

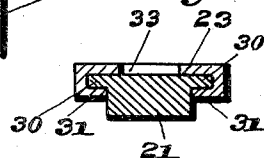
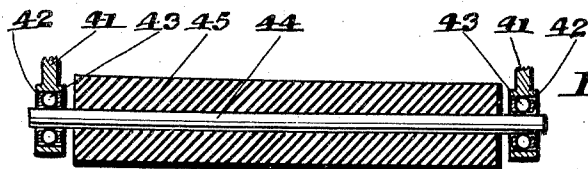


Fig. 3.



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DEVICE FOR REMOVING FOREIGN MATTER
FROM BELTS

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1 Claim. (Cl. 198—230)

This invention relates to a belt cleaning device. It has been proposed to clean conveyor belts of foreign matter by the use of revolving arms which periodically strike the exterior of the belt for shaking loose foreign matter, but in these types of construction the foreign matter is periodically beaten into the belt while the portions which are shaken off the belt clog the bearings and revolving parts of the agitators and it is then necessary to stop the machinery in order to clean the brushes or agitators together with the bearings before the operation of the conveyor belt can be resumed.

It is an object of the present invention to provide a belt cleaning device in the form of an agitator which will periodically tap the inner face of a traveling conveyor causing the foreign matter to be loosened and thrown away from the belt while the bearings and agitators are maintained in a position where the foreign matter cannot fall upon the moving parts of the agitators.

Another object of the invention is the provision of a device which is located between the moving sections of a conveyor belt and close to the lower moving section so that when the cleaning device is operated the interior face of the lower section of the conveyor will be periodically tapped throughout the full width for causing the foreign matter which has clung to the belt to be thrown downwardly and away not only from the moving belt, but from all of the moving parts of the cleaning device and also the operating elements of the conveyor.

A further object of the invention is the provision of a cleaning device for endless traveling conveyors on which materials are carried with the materials having a tendency to stick to the belt and thus interfere with the proper operation of the conveyor, the device consisting of a plurality of arms equipped with rollers located in such a position that the rollers will periodically contact the inner surface of the lower section of the traveling conveyor for loosening and for causing the foreign matter sticking to the conveyor to be thrown away from the traveling conveyor whereby the foreign matter clinging to the conveyor will never come into contact with the arms, rollers or bearings supporting the arms.

This invention will be best understood from a consideration of the following detailed description, in view of the accompanying drawing forming a part of the specification.

In the drawing:

Figure 1 is a side view of the cleaning device

constructed according to the principles of my invention.

Figure 2 is a transverse vertical section taken along the line 2—2 of Figure 1.

Figure 3 is an enlarged horizontal section taken along the line 3—3 of Figure 1.

Figure 4 is a horizontal section taken along the line 4—4 of Figure 2.

Referring more particularly to the drawing, 10 designates a pair of standards having bearings 11 at their upper ends in which is mounted a driven shaft 12. This shaft is driven in any suitable manner, not shown.

A pulley or drum 13 is keyed to the shaft 12 and a traveling conveyor, generally designated by the numeral 14, is trained on the driving drum 13 and also on a similarly constructed drum at the opposite end of the conveyor. The last idling drum, however, is not shown.

A pair of idling rollers 15 and 16, supported in any approved manner, engage respectively the inner and outer faces of the upper and lower sections 17 and 18 of the conveyor 14. These rollers, as is usual, support the section of the conveyor at spaced points.

A perforated pipe 20 is adapted to be connected to a source of water under pressure so that it will continuously spray water on the outer face of the lower section 18 of the conveyor 14 during the operation of the conveyor for thoroughly washing the surface of the belt after the main body of foreign matter has been removed.

A pair of bearings 21 are located at the opposite edges of the conveyor 14 and outwardly therefrom. Each bearing is slidably mounted in a standard 23 which has a horizontal flange 24. These flanges have a passage 25 to receive the smooth portion of a screw 26 which is threaded into a vertical passage 27 of the bearing 21. An operating handle 28 is secured to the outer end of the screw 26 and a collar 29 secured to the screw at opposite faces of the flange 24 maintains the screw against vertical movement when the screw is revolved for raising or lowering the bearing 21.

The bearings 21 have lateral flanges 30 received within a guide 31 formed at the opposite edges of the standards 23 so that the bearings will be maintained in a predetermined position during vertical movements on the standards.

A shaft 32 is carried by the bearings 21 and the opposite ends of the shaft project through elongated openings 33 formed in the standards 23. One end of the shaft 32 is provided with a sprocket 34 which has a hub 35 keyed at 36 to the

shaft. A chain 37 is trained on the sprocket 34 and likewise on a sprocket 38 secured to the shaft 12 outwardly of the drum or pulley 13.

A pair of hubs 40 are secured to the shaft 32 adjacent the outer edges of the traveling conveyor 14 and these hubs have diametrically disposed arms 41. Each arm has an enlargement 42 at its outer free end to receive a bearing 43 for the ends of a shaft 44 carrying a roller 45. These rollers when revolved move through an arc of a circle which cuts through the lower section 18 of the conveyor 14 so that the rollers will repeatedly strike the inner face.

Instead of the chain and sprockets shown at 34, 37 and 38, pulleys, a belt may be employed to obtain the same result.

The operation of my device is as follows:

When the conveyor belt is being operated by the pulley 13 and the shaft 12 the sprocket 38 will operate the chain 37 which in turn rotates the sprocket 34 and the shaft 32. The speed of rotation of the shaft and likewise the rate of revolution of the arms 41 depends upon the size of the sprocket 34 and the speed of the shaft 12. However, the speed of the shaft 32 may be controlled by a transmission which is well known in the arts.

When the arms 41 are revolved the rollers 45 will periodically contact the inner face of the lower section 18 of the traveling conveyor 14 and thus the conveyor will be subjected to a plurality of beats by the rollers 45 which are loosely mounted in the bearings 43 so that no abrasive action will be had upon the belt. Furthermore, these rollers may be made of rubber or some composition in order to eliminate the abrasive action and thus prolong the life of the traveling conveyor 14.

The repeated tapping of the belt by the rollers 45 loosens and then removes the foreign matter which sticks to the conveyor belt in advance of the spray of water from the perforated pipe 29. The spraying of the belt removes all fine particles which would have a tendency to stick to the belt after the cleaning action by the rollers 45.

It will be noted that the operating mechanism for the rollers 45 is located beyond the confines of the belt 14 and above the lower section 18 of the belt so that when the belt is beaten by the rollers the foreign matter will be thrown downwardly and will not collect upon any of the operating parts of the rollers. Furthermore, the cleaner or beater for the belt is an independent unit and can be assembled or disassembled as desired without disturbing any of the operation of the conveyor belt 14.

A container or small conveyor may be placed below the lower section 18 of the conveyor belt 14 to carry away the foreign matter which has been removed from the conveyor 14.

The force exerted by the rollers 45 on the inner face of the lower section 18 of the conveyor belt 14 is controlled by the screws 25 which are adjusted to raise or lower the shaft 32 so that where a greater or less force is required to remove the foreign matter from the belt this can be readily done by raising or lowering the bearings 21 for the shaft 32.

I claim:

A belt cleaner comprising a shaft passing transversely between the sections of a belt trained on a pair of pulleys, a pair of rollers diametrically disposed relative to the shaft, radial arms extending from the shaft and supporting the rollers, said rollers being located between the sections of the belt and adapted to contact the inner face of one section of the belt, means supporting the shaft at the opposite side edges of the belt, means rotating the shaft and revolving the rollers around said shaft in periodic whipping contact with the inner face of the belt so that said rollers will be constantly spun, means engaging the outer face of the belt and supporting the belt at transverse points adjacent to the points of whipping contact between the rollers and the inner face of the belt, and means adjustably positioning the shaft for controlling the degree of contact between the rollers and the belt and the speed of rotation of said rollers.

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