June 2, 1936. M. LAMORT 2,043,181

ENDLESS CONVEYER BAND FILTER

Filed March 2, 1934

Fig. 1

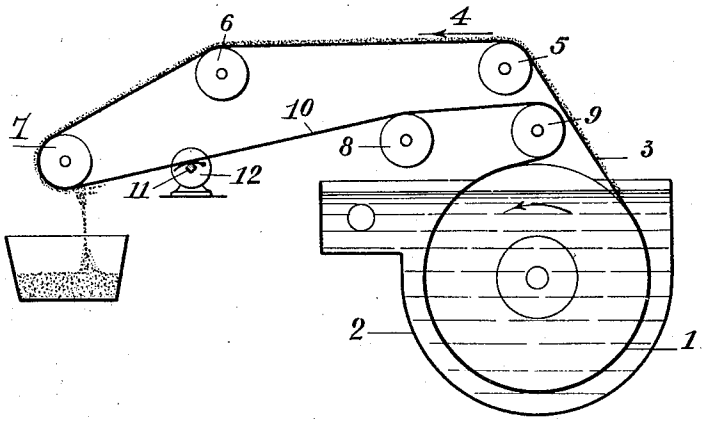


Fig. 2

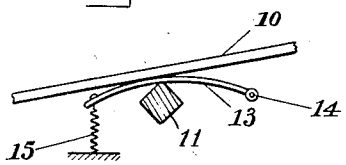
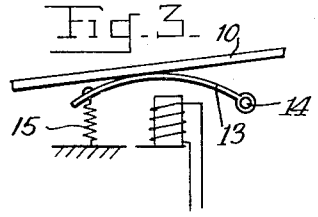


Fig. 3



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ENDLESS CONVEYER BAND FILTER

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7 Claims. (Cl. 92—36)

The present invention relates to filters and like apparatus, in which a wet material such as paper pulp is carried on a conveyer band and then flown over. The invention may particularly be applied to cellular filters for paper making.

It is known to shake a conveyer band in order to cause the fall of the materials carried by the same. Said shaking is accomplished by a positive drive of the endless band by means of a sort of cam revolving at low speed and rubbing against it. However this device causes a rapid wear of the cloth due to the friction of the cam and also to the tension of the cloth which may reach a value beyond the elastic limit.

According to the present invention the endless band is stretched and subjected to vibrations, as for instance in the manner of a vibrating chord. In this way the band is allowed to oscillate from either parts of its position of equilibrium without ever exceeding the elastic limit. Furthermore, the wear due to friction is greatly reduced, since small impulsions are sufficient to maintain such vibration. Finally since the motion is very rapid, the band is cleared from the particles which clog its meshes and also from the water it contains, being so carried back to the filtering device in a clean and dry state.

The vibrations imparted to the band may for instance be generated by means of a square section rod revolving at high speed and lightly touching the band with its edges. The wear may be reduced by inserting an oscillating blade between the band and the revolving rod.

By way of example and in order to facilitate the understanding of this invention the accompanying drawing shows:

Figure 1 an elevational view of a cellular filter according to the invention.

Figure 2 an enlarged scale view of the impulsion device.

Figure 3 is a view, similar to Fig. 2, but showing an electromagnetic vibrating device.

The plant comprises a drum or rotor 1, revolving into a tank 2 which contains the mixture to be filtered. An endless wire cloth filtering band 3 covers the rotor 1 on the major part of its periphery. Said cloth moves in the direction of the arrow 4 and travels on the rolls 5, 6, 7, 8, 9, thus carrying the pulp cake which is accumulated at its surface whilst the band was upon the rotor 1. In fact the filtered liquid is sucked into the drum whilst the cake is formed upon the length of band which covers the periphery of the said drum.

On the length 10 of the band, the cake comes at the lower surface of the wire cloth after turning upon the roll 7. In this place the pulp is no more supported by the band but will be retained by adhesion. In front of the said length of band is provided a square section rod 11 carried horizontally by the shaft of an electric motor 12. Between said rod and the band 10 is inserted a blade 13 pivoted at 14 and pulled downwards by a tension spring 15.

The electric motor revolves at 3000 R. P. M. causing the oscillation of the blade 13 which comes in contact with the band 12,000 times per minute. Provision is made in order that the touch be as light as possible and in practice the band does not seem to move. The own frequency of the length of band comprised between the rolls 7 and 8 is exactly equal to 12,000 cycles per minute; in other words the band thus freely oscillating would accomplish 12,000 paths forwards and backwards per minute.

Under the action of said vibration, the pulp cake is detached and falls into a receptacle. Furthermore the particles of the materials which clog the meshes of the wire cloth are projected outwards. Finally, the rapid motion dries the cloth which is very advantageous.

It will of course be understood that the vibration of the band 10 could be obtained by an electro-magnetic vibrating device or a compressed air stream or even by causing one of the rolls such as 7 to vibrate.

Having now particularly described and ascertained the nature of my invention and in what manner the same is to be performed, I declare that what I claim is:

1. Process for removing the caked residue from cellular filters for paper pulp and the like in the form of an endless band of metal gauze, comprising vibrating the said band.

2. Process for removing the caked residue from cellular filters for paper pulp and the like in the form of an endless band of metal gauze, comprising vibrating the said band, at a frequency which is either substantially equal to or is a sub-multiple of the natural frequency of the band.

3. A cellular filter for paper pulp and the like, comprising an endless band of metal gauze, and means for vibrating the band to remove the caked pulp therefrom.

4. A cellular filter for paper pulp and the like, comprising an endless band of metal gauze, and means for vibrating the band at a frequency which is substantially equal to or is a sub-multiple of the natural frequency of the band.

5. A cellular filter for paper pulp and the like, comprising an endless band of metal gauze, a shaft having a plurality of edges thereon, means for turning said shaft at high speeds, and an oscillatable blade disposed between said shaft and said band, in such manner that the edges of the shaft strike said blade and vibrate the same against the band, to remove the caked pulp from the latter.

6. A process for cleaning a band carrying a wet material, comprising imparting a vibrating motion to said band by an electro-magnetic vibrating device.

7. An apparatus for cleaning a metallic band carrying a wet material, comprising an electro-magnetic vibrating device, an armature for said vibrating device, and biasing means for said armature, the said armature being capable of lightly touching the band under the energization of the electro-magnet, so that a vibrating motion will be imparted to the band.

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