

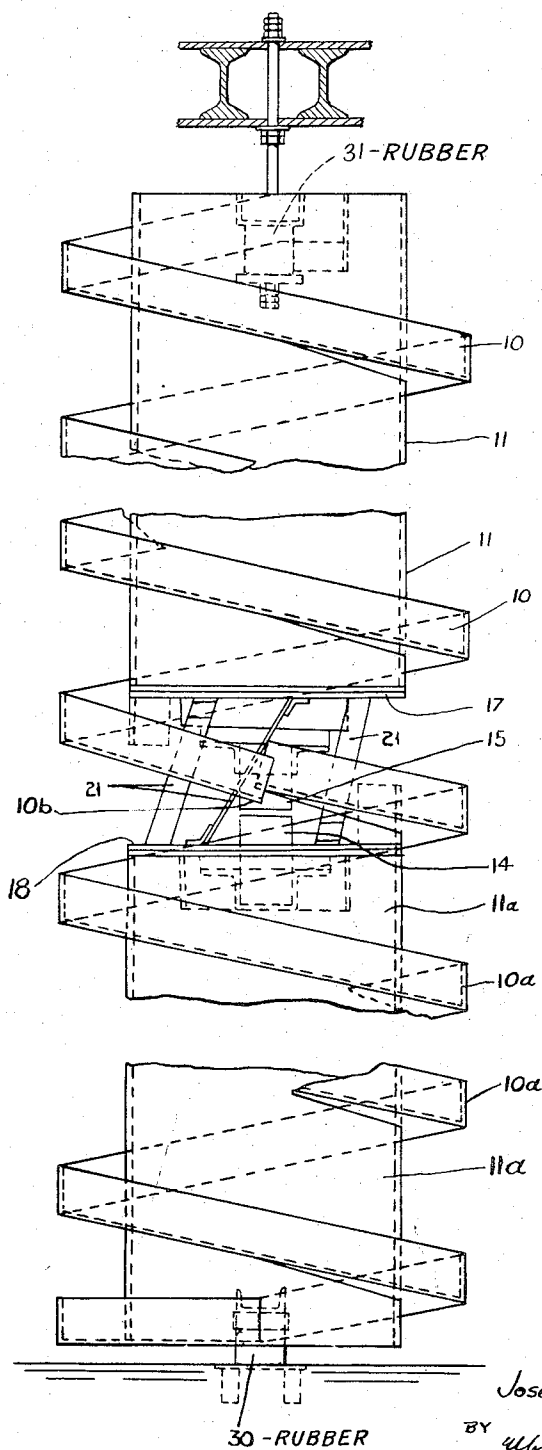
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APPARATUS FOR CONVEYING MATERIALS AND ARTICLES

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APPARATUS FOR CONVEYING MATERIALS AND ARTICLES

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5 Claims. (Cl. 198—220)

The present invention relates to apparatus for conveying materials and articles.

According to the present invention a conveyor for conveying material or articles in a generally helical curved path comprises two supports for the material or articles to be conveyed and each of generally helical form disposed one in continuation of the other, means for imparting to each of said supports oscillatory movements about a generally vertical axis and means for imparting to each support oscillatory movements generally along said axis, said oscillatory movements being imparted to the two supports so that they move in opposite directions.

Preferably each support is resiliently mounted to permit the oscillatory movements. For example, the upper support may be suspended from a resilient mounting arranged at its upper end while the lower support is carried by a resilient mounting at its lower end.

A feature of this invention consists in using common means for imparting the oscillatory movements to the two supports, the common means being arranged between or at the junction of the two supports. For example, if each of the supports is carried by a tubular member, common means for imparting the oscillatory movements to the two supports may be mounted between the tubular members.

One form of construction in accordance with the present invention will now be described by way of example with reference to the accompanying drawing which shows a side elevational view of the apparatus.

The conveyor consists of two generally similar supports 10 and 10a disposed helically around vertical coaxial tubular members 11 and 11a respectively and of approximately equal weights and lengths. In use the material or articles to be conveyed is or are arranged to move progressively along the supports 10 and 10a, for example being fed onto the conveyor at the lower end of the lower support 10a and being discharged from the upper end of the upper support 10. The upper support 10 is arranged in continuation of the lower support 10a, the upper end of the lower support being arranged to overlap the lower end of the upper support as indicated at 10b so that material or articles to be conveyed may be transferred from the lower support to the upper. As the amplitude of the oscillatory movement can be quite small the extent of the overlap between the two supports and the vertical separation between them can be made small.

At its lower end the tubular member 11a carrying the lower support 10a is carried by a resilient mounting 30 which permits oscillatory movements in a vertical direction as well as oscillations about the vertical axis of the tubular member. For example, the resilient mounting may consist of a block of rubber disposed close to the vertical axis of the tubular member. The tubular member carrying the upper support is arranged to be suspended from a stationary member through a resilient mounting 31 which may be generally similar to the

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resilient mounting 30 and which is disposed close to the vertical axis of said upper tubular member 11 and suspended by a rod 32. The upper end of the lower tubular member 11a is spaced away from the lower end of the upper tubular member 11 and an electro-magnetic vibrator is mounted between the two. The electro-magnetic vibrator comprises a yoke 14 carrying a magnetising winding, an armature 15 and upper and lower flanges 17 and 18 coupled to the yoke and armature respectively and separated by leaf springs 21 inclined at an angle of about 70° to the vertical. When electric current is passed through the magnetising winding mounted on the yoke 14 the armature 15 is attracted towards the yoke 14 so that the upper and lower flanges 17 and 18 are caused to move towards one another against the action of the inclined leaf springs 21. Due to the inclination of the springs 21 a rotary movement about the vertical axis is imparted to the flanges 17 and 18 in addition to the movement towards one another. Owing to the inertia of the upper and lower supports and the tubular members on which they are mounted, and by reason of the resilient mountings of these parts, the electro-magnetic vibrator will cause the upper and lower supports 10 and 10a to move in opposite directions when an intermittent or alternating current is fed to the magnetising winding. If the moment of inertia and weight of the upper parts 10 and 11 is approximately equal to the moment of inertia and weight of the lower parts 10a and 11a, the amplitudes of oscillation of the upper and lower parts respectively will be approximately equal. This arrangement avoids the provision of a relatively heavy undercarriage which has previously been used with electro-mechanical vibrators.

I claim:

1. A conveyor for conveying material or articles in a generally helical curved path comprising two supports for the material or articles to be conveyed, each of generally helical form and disposed one in continuation of the other, each of the supports being carried by a tubular member, the axes of said tubular members being disposed vertically, said tubular members being connected by leaf springs inclined to a plane perpendicular to said axis, and electro-magnetic actuating means mechanically interposed between said tubular members for causing flexure of said leaf springs and thereby causing oscillatory movements of said supports in opposite senses about a generally vertical axis and in opposite senses along said vertical axis.

2. A conveyor according to claim 1, wherein the two supports are carried by resilient mountings at their opposite extremities.

3. A conveyor for conveying material or articles in a generally helical curved path comprising two tubular members disposed vertically one above the other, two supports for the material or articles to be conveyed, each support being carried by one of said tubular members, being of generally helical form and said two supports being disposed one in operative continuation of the other, a plurality of leaf springs connecting together said tubular members, said leaf springs being disposed around the common vertical axis of said tubular members and being inclined to the horizontal plane, and electro-magnetic actuating means having a yoke carrying a magnetising winding which is attached to one of said tubular members and an armature which is attached to the other of said tubular members and which is adapted to be repeatedly attracted to said yoke and magnetising winding to cause flexure of said leaf springs and oscillatory movements of said tubular members and said supports in opposite senses about and along said vertical axis.

4. A conveyor according to claim 3, wherein said two

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tubular members are carried by resilient mountings at their opposite extremities.

5. A conveyor according to claim 3, wherein the moment of inertia and weight of one tubular member and its associated support is approximately equal to the moment of inertia and weight of the other tubular member and its associated support.

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