Nov. 11, 1941. M. J. ANDERSON 2,262,443

ROLLER CONVEYER

Filed June 29, 1940

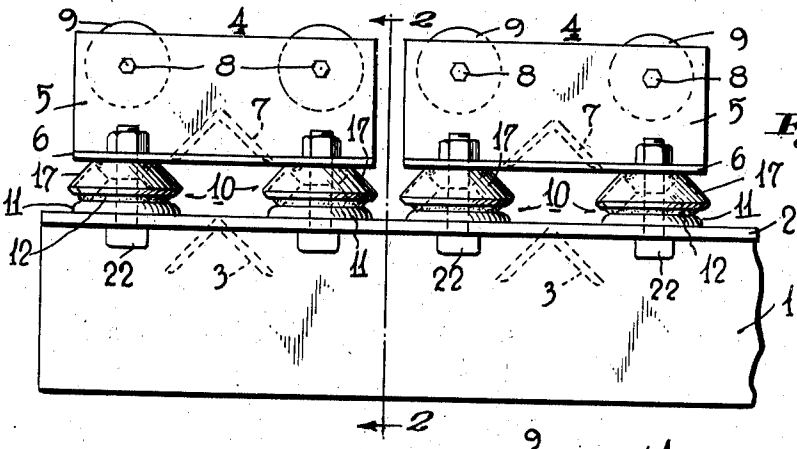


Fig. 1

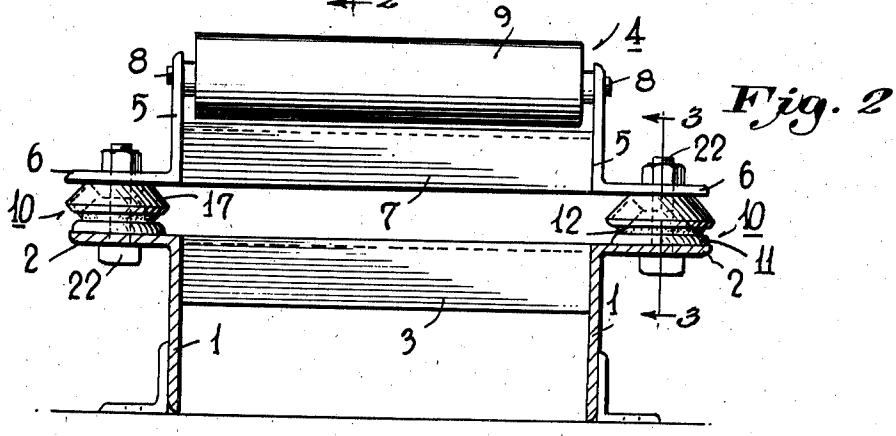


Fig. 2

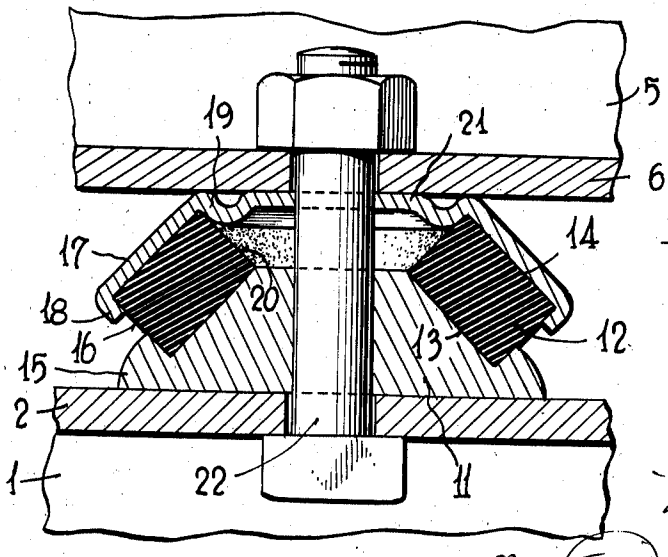


Fig. 3

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Patented Nov. 11, 1941 2,262,443

UNITED STATES PATENT OFFICE

2,262,443

ROLLER CONVEYER

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Application June 29, 1940, Serial No. 343,287

2 Claims. (Cl. 193—35)

This invention relates to conveyers and is directed more particularly to resiliently mounted roller conveyers such as those disclosed in Rishel Patents Nos. 2,077,188, 2,077,189 and 2,077,190 and in Hahn Patent No. 2,107,822.

The advantages of resiliently mounted roller conveyers, such as self-alignment of the rollers, proportionate distribution of the load, transportation of irregularly shaped articles, and saving wear on the rollers and bearings therefor, are fully discussed in the above patents and are now well known in the art.

The primary object of this invention is to provide an improved resilient rubber mounting for conveyers wherein the maximum effectiveness of the rubber is attained by placing it in shear instead of solely in direct compression as will hereinafter more fully appear.

A further object of my invention is to provide an improved resilient rubber mounting for conveyers that will absorb horizontal thrusts in all directions caused by the movement of a load on the rollers, as well as offer resiliency and resistance to vertical forces due to the weight of a load on the rollers.

A still further object of my invention is to provide a resilient rubber mounting for roller conveyers that is efficient, inexpensive to manufacture, and wherein the rubber portion of said mounting may be readily replaced.

In the drawing accompanying and forming a part of this application wherein like numerals designate like parts,

Figure 1 is a fragmentary side elevation of a conveyer constructed in accordance with my invention and illustrating each resiliently mounted unit as having two rollers;

Figure 2 is a vertical section taken on the line 2—2 of Figure 1; and

Figure 3 is an enlarged fragmentary vertical section taken on the line 3—3 of Figure 2.

In the drawing, I have illustrated my invention applied to a conveyer comprising a support and a plurality of roller units mounted thereon, each unit having two rollers. This illustration of my invention will now be described in detail.

The conveyer consists of frame members 1, preferably made of angle iron having horizontal flanges 2, and connected by cross pieces 3 to form a suitable base. A plurality of roller units indicated generally at 4 are supported by the horizontal flanges 2 of frame members 1.

Each of the roller units 4 is substantially identical in structure and preferably consists of a pair of laterally spaced angle iron side frames 5 having base flanges 6 which are arranged substantially parallel to the horizontal flanges 2 of frame members 1. A cross piece 7 is connected between each pair of side frames 5 to hold them in laterally spaced relation and make each unit an independently rigid structure. Extending transversely of the unit 4 and mounted in the side frames 5 are a pair of longitudinally spaced cross shafts 8 each of which carries a load supporting roller 9 with suitable bearings to permit free rotation on the cross shafts 8.

The roller units thus far described are of standard construction, and it is obvious that any other suitable unit might be used equally well. It is also obvious that only one, or any number of rollers may be included in each unit.

Interposed between the horizontal flanges 2 of the frame members 1 and the base flanges 6 of the side frames 5 are a plurality of resilient mountings designated generally at 10, one of which is clearly shown in Figure 3.

Each resilient mounting consists of a conically shaped base disc 11 which is adapted to rest on the horizontal flanges 2. A resilient rubber ring 12, substantially in rectangular cross section and having its inner and outer surfaces 13 and 14 extending downwardly at an angle away from its longitudinal axis, is adapted to rest on the base disc 11 with the inner surface 13 in engagement with the conical surface of the base disc. An annular shoulder 15 on the base disc 11 engages the outer periphery 16 of the ring 12 to hold the ring in position. A conically shaped cover plate 17 has its inner surface in engagement with the outer surface 14 of the ring 12 and the cover plate is formed with inwardly directed shoulders 18 and 19 which engage the outer periphery 16 and inner periphery 20 of the ring. The top of the cover plate 17 is formed with a flat surface 21 to engage the lower side of the base flange 6.

In assembling the conveyer, the resilient mounting 10 is secured between the horizontal flanges 2 and the base flanges 6 by a bolt 22 which projects through vertically aligned holes formed in the base disc 11 and the cover plate 17.

The resilient rubber ring 12 may be formed of any suitable composition of rubber to obtain the desired resilience depending upon the weight of the load to be carried by the rollers.

In some instances, as when the conveyer is used for heavy loads, I find it desirable to place the resilient mounting under an initial strain in addition to the weight of the rollers and the load in order to increase the effectiveness of the resil-

ient rubber ring 12. This may be accomplished by tightening the bolts 22.

It will readily be seen that the downward force caused by the weight of a load on rollers 9 will act on the resilient rubber ring 12 through the shoulder 19 of the cover plate and will be resisted by the engagement of the shoulder 15 on the base disc, thereby tending to shear said ring as well as by the compression of the rubber between the conical surface of the base disc 11 and the inner surface of the cover plate 17. Since it is well known that rubber in shear will permit greater displacement than rubber in compression for a given force, it is obvious that the resilient mountings embodied in my invention will respond to the weight of a load on the rollers more effectively than mountings wherein the rubber is solely in direct compression, and hence less rubber will be required for any given condition.

In addition, the resilient characteristics of rubber mountings in shear are different from those of mountings solely in direct compression. As is well known, the resiliency of rubber in shear decreases at a substantially lower rate than the resiliency of rubber in compression. Likewise, the resistance of rubber in shear to further displacement increases at a much lower rate than that at which rubber in compression increases. As a result, roller conveyers having rubber mountings in shear afford a smoother movement of the load along the rollers because the weight of the load alone does not dissipate the resiliency of the rubber. Even though the rubber mountings are deflected due to the weight of a load on the rollers, they are still capable of further displacement to offset irregularities in the surfaces of either the rollers or the load and to absorb shocks caused by such irregularities.

The advantages of these mountings are even more apparent when they are subjected to an initial strain independent of the weight of the roller units and the load supported by the rollers. When a rubber mounting is subjected to a direct pre-compression independent of the weight of the rollers and the load, the mountings lose some of their resilient qualities and offer much greater resistance to additional compression. However, when rubber mountings are deflected in shear within reasonable limits, their resiliency is not materially diminished and they are capable of further deflection to absorb shocks due to the movement of the load on the rollers.

It will also be readily seen that the resilient mountings herein described offer resiliency and resistance to horizontal thrusts in all directions and will absorb shocks caused by movement of the load on the rollers as well as the vertical force due to the weight of the load. For example, when a load is moving longitudinally of the conveyer, the rollers supporting the load will be disposed at a slightly lower level than those rollers which the load is approaching. It is evident, therefore, that when the leading portion of the load moves from one roller to the next, it will strike the latter roller with a horizontal force before it begins to depress the roller to the same level. Unless the impact of this force is absorbed, the rollers and bearings will be subjected to wear. By using resilient rubber mountings as herein described, the impact is transmitted to the mounting and acts in shear on the rubber rings whereby the impact is absorbed. Since the rubber rings are deflected in shear, they permit a relatively greater displacement of the rollers longitudinally of the conveyer which eases the load onto and over the rollers. In a similar manner, horizontal shocks on the rollers in any direction due to shifting the load transversely of the conveyer or any other cause will be readily absorbed by the rubber ring in the resilient mounting.

It is obvious, of course, that my improved rubber mounting will readily cushion vertical forces of impact resulting, for example, from dropping relatively heavy loads onto the conveyer rollers as often happens when electromagnets are used for placing the load on the conveyer.

What I claim is:

1. A resiliently mounted roller conveyer comprising a base, a plurality of roller units carried by said base, each of said roller units including a frame for supporting the rollers having oppositely extending horizontal flanges overlying said base, and a plurality of resilient mountings interposed between said flanges and said base to resiliently support said units, each of said mountings including a conically shaped base disc having a shoulder extending upwardly at an inclined angle from the surface of said cone, a resilient rubber ring substantially rectangular in cross section adapted to lie on the surface of said cone and engage said shoulder, and a cover plate having a portion extending downwardly at an angle to overlie said rubber ring and an inwardly directed shoulder for engaging the inner periphery of said ring whereby the force due to the weight of a load on said rollers will act in compression on said rubber ring between the downwardly extending portion of said cover plate and the conical surface of said base disc, and will act in shear on said rubber ring between the shoulder on said cover plate and the shoulder on said base disc.

2. A resiliently mounted roller conveyer comprising a base, a plurality of roller units carried by said base, each of said roller units including a supporting frame having oppositely extending horizontal flanges overlying said base and transversely spaced vertical flanges carrying transversely disposed rollers, resilient mountings interposed between the horizontal flanges of each of said roller units and said base to resiliently support said units, each of said resilient mountings including a conically shaped base disc adapted to rest on said base and having a shoulder formed around the lower portion thereof extending upwardly at an inclined angle from the surface of said cone, a resilient rubber ring substantially rectangular in cross section adapted to lie on the conical surface of said disc with its outer periphery engaged by said shoulder to limit downward movement of the rubber ring, and a cover plate having a substantially flat top portion for engaging the horizontal flange of said roller unit and a portion extending downwardly at an inclined angle from said top portion adapted to overlie a surface of said rubber ring, said downwardly extending portion being formed with inwardly directed shoulders for engaging the inner and outer peripheries of said rubber ring whereby the weight of a load passing over said rollers will act in compression and shear on said rubber ring, and means extending substantially through the center of each of said resilient mountings for connecting said roller units to said base to limit horizontal displacement of said units relative to said base.

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