Aug. 14, 1962 R. F. LO PRESTI 3,049,220

FREELY SUSPENDED RETURN ROLLER ASSEMBLY
FOR ROPE SIDE FRAME CONVEYORS

Filed April 18, 1960 2 Sheets-Sheet 1

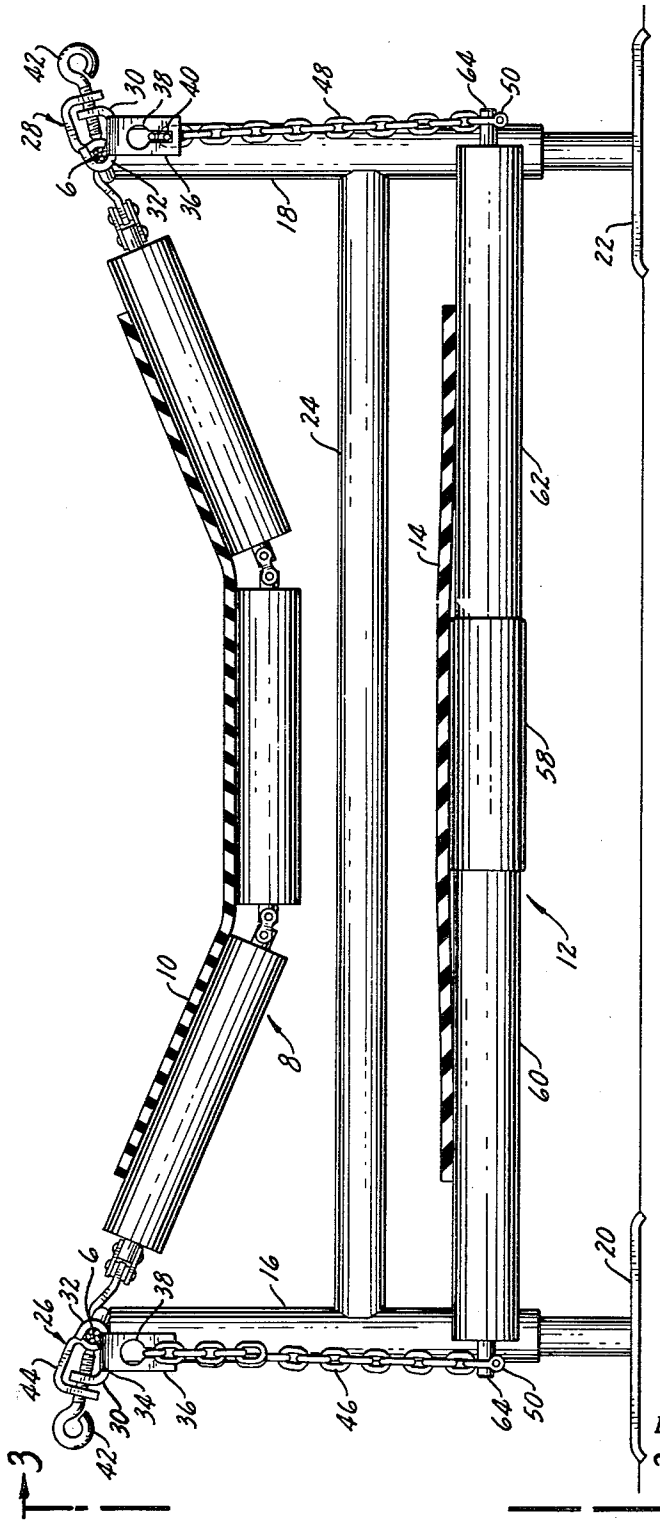

Fig. 2.

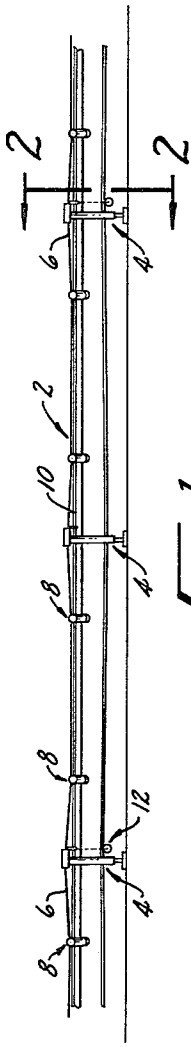

Fig. 1.

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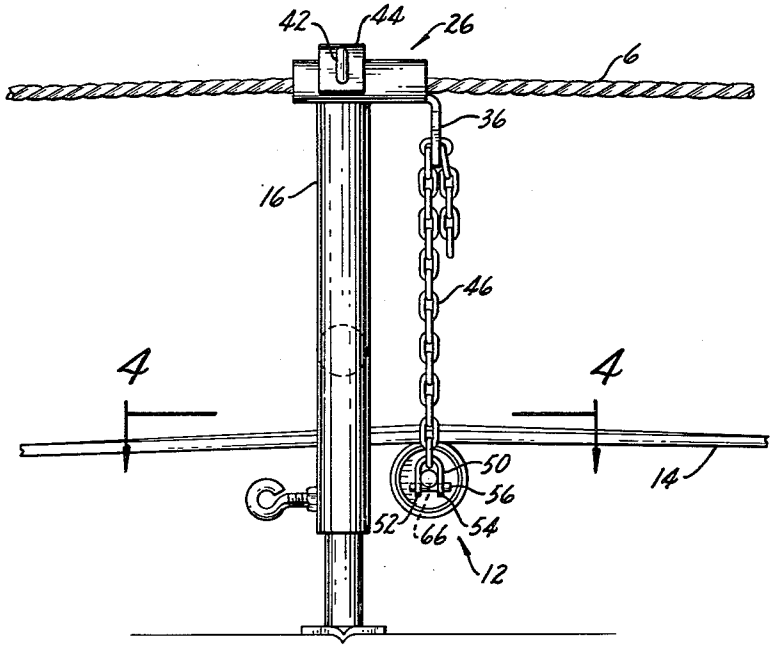

Fig. 3.

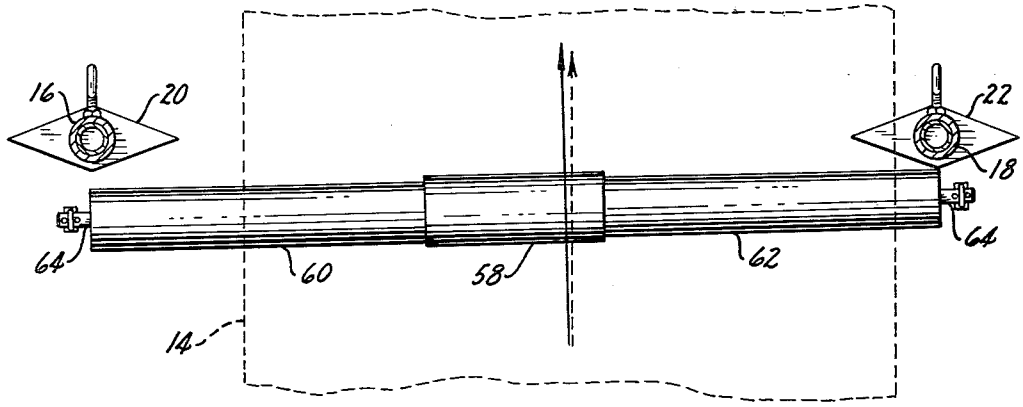

Fig. 4.

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3,049,220

FREELY SUSPENDED RETURN ROLLER ASSEMBLY FOR ROPE SIDE FRAME CONVEYORS

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1 Claim. (Cl. 198—192)

This invention relates in general to rope side frame conveyors and more particularly to a novel structure for supporting freely suspended return roller assemblies.

A rope side frame conveyor normally has flexible ropes carried by support stands placed at regular intervals along the path of the conveyor assembly. The support stands generally are comprised of two telescoping members connected by a rigid crossbar. The members carry rope seats and clamps at their upper extremities. The flexible ropes are clamped in the rope seats on each of the support stands along the path of the conveyor and normally support troughing idler assemblies at spaced intervals between the longitudinally aligned stands.

It is common practice to provide return roller assemblies at spaced intervals along the path of the conveyor to support the return reach of the conveyor belt. In one construction return rollers are mounted for rotation about a fixed axis on each support stand, or alternate support stands, depending upon the type of terrain on which the conveyor is operated. Such a return roller assembly, however, presents a number of difficulties. Belt training is desired for the maintenance of proper travel of the return reach as well as the carrying reach of the conveyor belt. Consequently, the stands must be maintained in proper transverse relationship to the return reach of the conveyor belt to prevent a canted effect from existing between a return roller and the return reach. This canting of the rollers exerts a lateral force on the return reach with consequent belt detraining effects. Proper transverse alignment of the stands is difficult to establish and in addition they are easily kicked or moved out of line in operation.

The freely suspended return roller assemblies eliminate a substantial amount of the detraining effect on the return reach of the conveyor belt. To provide additionally improved return reach training, however, the center portion of the return roller is enlarged to provide a so-called fat roller. This improvement is embodies in a co-pending application entitled "Automatic Belt Training Roller Assembly for Belt Conveyor," Serial No. 807,227, filed April 17, 1959.

A remedy for this situation is to remove the return rollers from the rope supporting stands and freely suspend them from specially constructed return roller assembly support clamps and hangar chains secured to the ropes and spaced at appropriate intervals between the rope supporting stands. The requirement of specially designed chain and hangar support means for the freely suspended return roller assemblies presents increased cost problems to the manufacturer.

Accordingly, a primary object of this invention is to provide a simple and inexpensive support means for freely suspended return rollers of a rope side frame conveyor.

Another object is to provide a rope side frame conveyor having unitary support means for the flexible ropes and the freely suspended return rollers.

Still another object is to provide unitary support means for the flexible ropes and the freely suspended return rollers of a rope side frame conveyor wherein sufficient clearance is provided between a return roller assembly and a support stand to allow canting of the return roller.

Still another object of this invention is to provide an elongated seat for the flexible ropes of a rope side frame conveyor which is carried by a support stand and includes means for releasably suspending the flexible support ropes of a freely suspended return roller.

This and other objects of this invention will appear in the following specification and claim wherein like reference numerals identify like parts throughout.

The invention is shown somewhat diagrammatically in the drawings wherein:

FIGURE 1 is a side view of a portion of a rope side frame conveyor showing ropes and freely suspended return roller assemblies supported by stands spaced longitudinally of the conveyor,

FIGURE 2 is a front elevation taken generally through line 2—2 of FIGURE 1,

FIGURE 3 is a side elevation of the portion of the rope side frame conveyor taken generally along line 3—3 of FIGURE 2, and

FIGURE 4 is a plan view of the return roller taken along line 4—4 of FIGURE 3.

Shown generally at 2 in FIGURE 1 is a portion of a rope side frame conveyor. A series of regularly spaced support stands 4 carry the flexible ropes 6 of the conveyor assembly at their upper extremities. Suspended from the ropes 6 at longitudinally spaced intervals are troughing idler assemblies 8. The troughing idler assemblies support a carrying reach 10 of a conveyor belt. Freely suspended from alternate support stands and shown generally at 12 are return roller assemblies. The return rollers support the return reach 14 of the conveyor belt.

A support stand 4 comprises a pair of upright telescoping members 16 and 18. Members 16 and 18 are supported by ground engaging base plates 20 and 22. Rigidly connecting the upright members approximately midway between their upper and lower extremities is crossbar 24.

Supported on top of each of the upright members 16 and 18 are elongated rope seats 26 and 28. Rope seats 26 and 28 are identical in structure and include longitudinally extending generally upright flanges 30 and 32. A web 34 connects the upright flanges 30 and 32 at their bases. The web 34 has an ear 36 extending downwardly at right angles to the web at one end. Ear 36 has a hole 38 and a contiguous slot 40 therein. Each rope seat is mounted on its respective supporting member so as to have a major portion of its length on one side of said member. Threaded in each of the upright flanges 30 at a point in longitudinal alignment with a corresponding support member is a wing screw 42. Wing screw 42 carries a clamp 44 thereon and clamp 44 is adapted to engage flange 32 as best shown in FIGURE 2.

The flexible ropes 6 are supported in the rope seats between the flanges 30 and 32. A clamp 44 engages a rope 6 in locking relationship with a flange 32 to fixedly secure a rope in its seats.

Releasably suspended in the slots 40 of the ears 36 are link chains 46 and 48. Chains 46 and 48 carry at their lower extremities inverted U shaped brackets 50 having eyes 52 and 54 in their downwardly extending legs. Removably insertable in eyes 52 and 54 therein is locking pin 56.

The return roller assembly 12 is comprised of a roller having a center portion 58 of enlarged diameter and side portions 60 and 62 of somewhat smaller diameters than center portion 58. The roller rotates unitarily about dead shaft 64. Dead shaft 64 has a slot 66 machined in the bottom surface of each end of the shaft longitudinally of the conveyor. Bracket 50 fits over the ends of the dead shaft 64 in snug relationship therewith. Pin 56 has freedom of movement through pin slots 52 and

54 and slot 66 when the dead shaft is engaged by the brackets. Consequently, when pin 56 is inserted, the freely suspended chains 46 and 48 are secured to the ends of the dead shaft 64.

As is best seen in FIGURE 2, the chains 46 and 48 diverge slightly between ears 36 and the outer ends of the dead shaft 64. This is to facilitate the canting movement of the return roller 12 in adapting itself to the direction of travel of the return reach of the conveyor belt. In practice the supporting chains 46 and 48 may diverge, as shown, converge, or extend perpendicularly downward in relation to the return roller. The peculiar advantages of each of these relationships are set out in detail in a copending application entitled "Supporting Structure for Belt Conveyor," Serial No. 772,106, filed November 5, 1958.

The use, operation, and function of this invention are as follows:

Longitudinally extending rope seats 26 and 28 are secured at the top of the upright members of each support stand. Ears 36 extend downwardly from the extended ends of the rope seats upstream of each of the support standards, as best seen in FIGURE 3. As described above, the rope side strands are secured in the seats 26 by clamps 44 carried by wing screws 42.

At pre-determined intervals along the path of the conveyor, depending upon the local topography, support for the return reach 14 of the conveyor belt is required. As shown in FIGURE 1, the return rollers 12 are freely suspended from a support stand 4 wherever such support is required. The chains 46 and 48 may be easily secured in the ear slots 40 at alternate support stands, for example, providing support for the return reach of the conveyor belt at approximately twenty-foot intervals in the path of the conveyor travel. It is obvious, however, that the chain supported return rollers 12 can be easily secured to any of the generally regularly spaced support stands.

As seen in FIGURE 2, the crossbar 24, rigidly connecting the upright stands 16 and 18, is spaced between each troughing idler assembly 8 and the return reach of the belt 14.

FIGURE 4 shows the relationship of a return roller to the return reach 14 wherein the conveyor belt has moved off to one side of the return roller and caused the return roller to cant relative to the direction of conveyor belt travel. As is described in the aforementioned application, entitled "Automatic Belt Training Roller Assembly for Belt Conveyor," a roller having a large center portion exerts a substantial training effect. This force is exerted, as shown in FIGURE 4 wherein the dotted line arrow indicates the direction of conveyor belt travel, along the solid line arrow. The effect is to train the conveyor belt back to a generally centered relationship on the return roller.

Since the rope seats 26 and 28 and, consequently, the ears 36 extend a substantial distance upstream of the

stands 16 and 18, a suspended return roller has substantial freedom of canting movement and a canted effect sufficient to exert a proper training effect of any magnitude required is permitted.

This device provides a unitary support for the flexible strands of a rope side frame conveyor and a freely suspended return roller for the conveyor belt. The combination permits proper belt training by the freely suspended return roller assembly and eliminates the need for individual return roller supports. A great saving in conveyor system expense is realized with the elimination of a number of heretofore required parts. The use of the conveyor assembly is simplified in that the time for set up and knock down operations is proportionally shortened.

The foregoing description is intended to be illustrative only and not definitive and it is intended that the scope of the invention be limited only by the appended claim.

I claim:

In combination with a belt conveyor of the type in which a plurality of troughing idler assemblies for supporting the conveying reach of a flexible conveyor belt are suspended at intervals from a pair of wire ropes which are trained in generally parallel relationship to one another along a conveying course, said wire ropes being supported at spaced locations from ground engaging support stands, the improvement comprising means for suspending a return roller from a support location which enables the return roller to hang freely and cant as needed to provide a training effect for the return reach of the conveyor belt, said return roller assembly suspending means including a pair of rope seats, each one of said pair being secured to a pair of oppositely positioned support stands, each one of said rope seats having a wire rope receiving bight portion and means for forcing a wire rope into snug engagement with each bight portion, each rope seat having a flange extending in a direction parallel to the longitudinal axis of the conveyor in a direction away from its associated support stand, each of said flanges terminating, at its remotest end, in a generally vertically oriented ear, each ear having a keyhole slot therein, a return roller, and a bodily flexible suspending member such as a chain secured, at its lower end, to an end of the return roller, the upper end of the suspending member being received in the keyhole slot.

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