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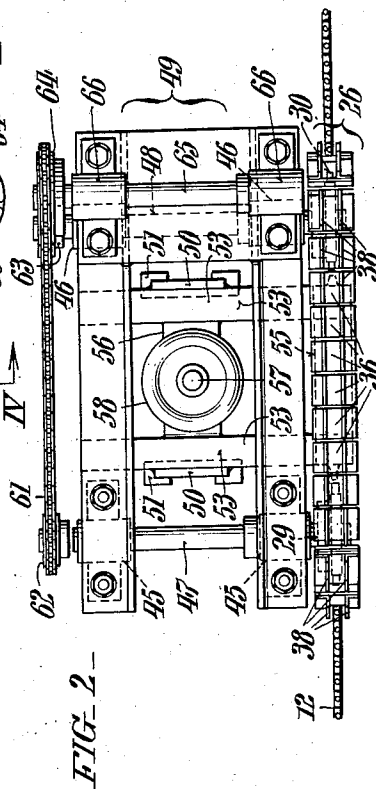
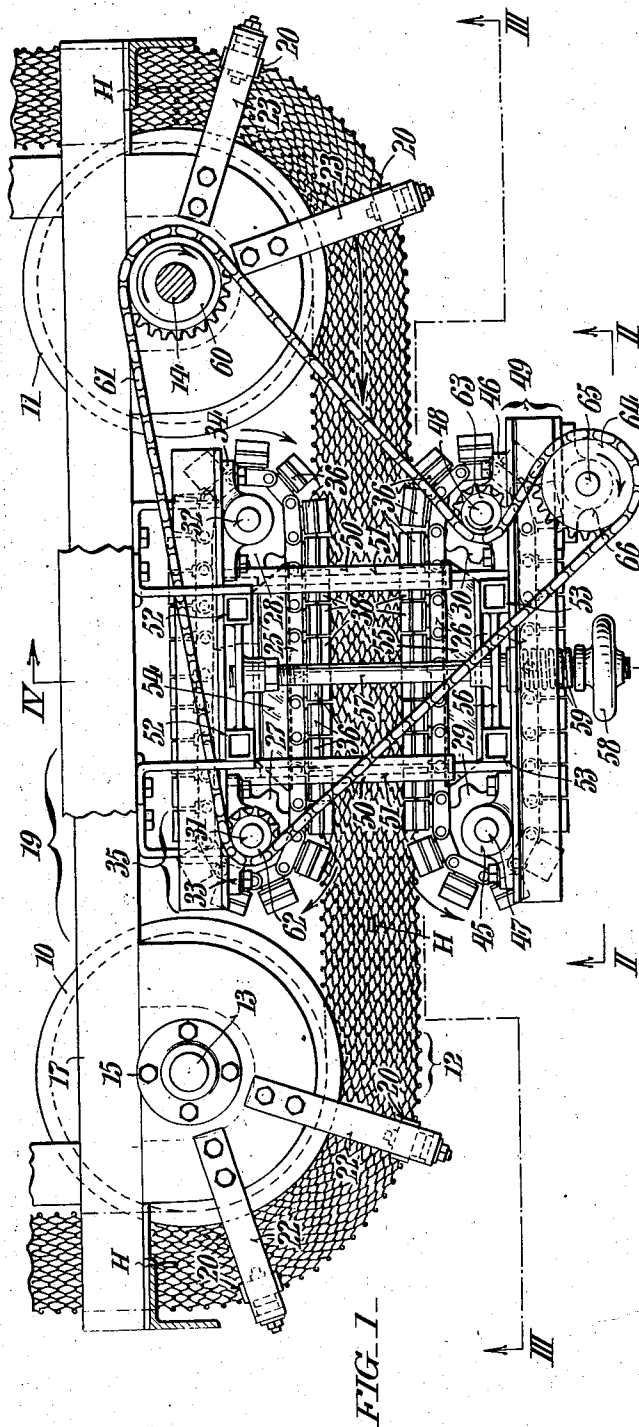
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2,386,558

CONVEYER BELT DRIVE MECHANISM

Filed Nov. 23, 1943

3 Sheets-Sheet 1



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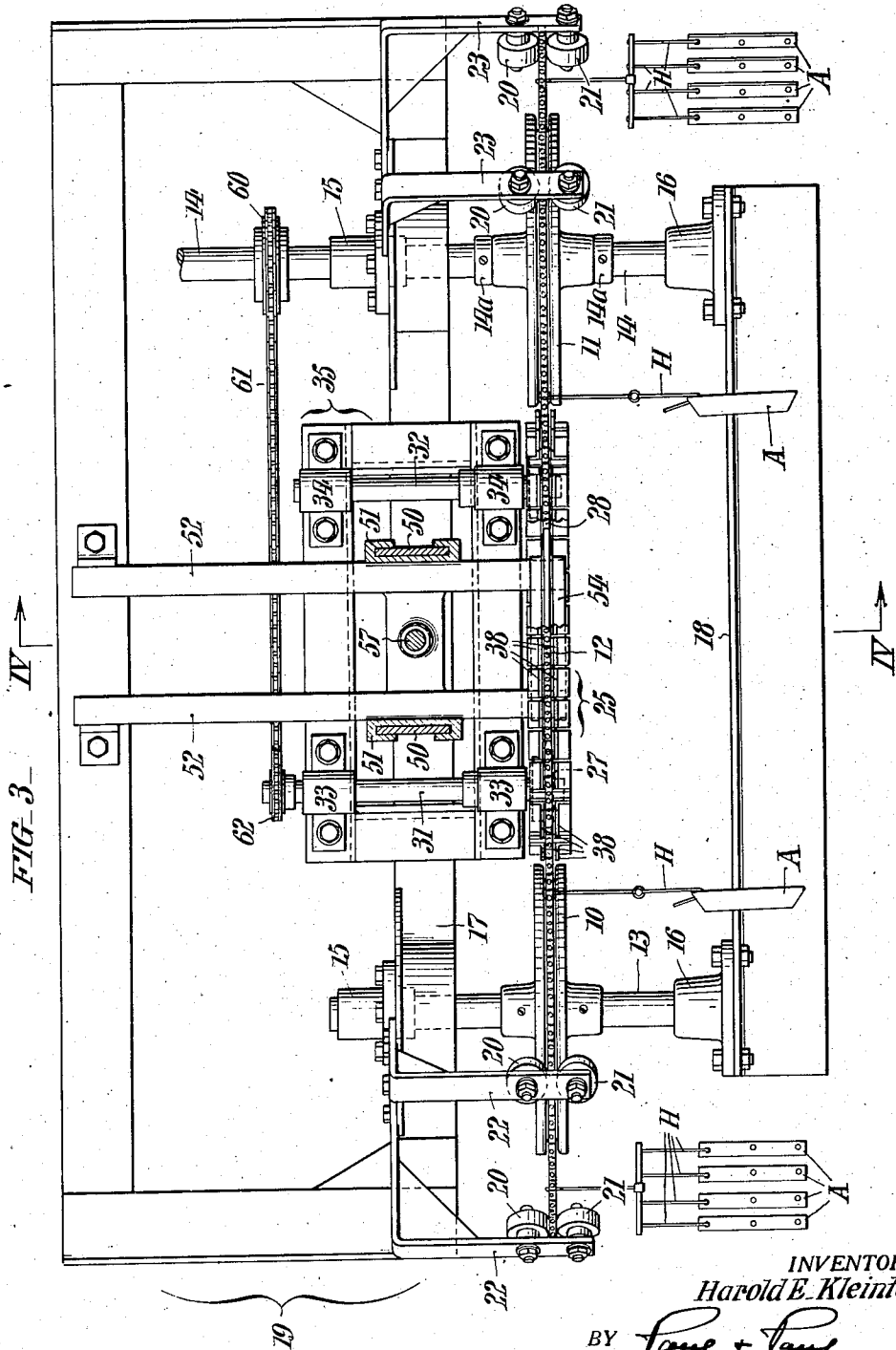
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FIG. 4.

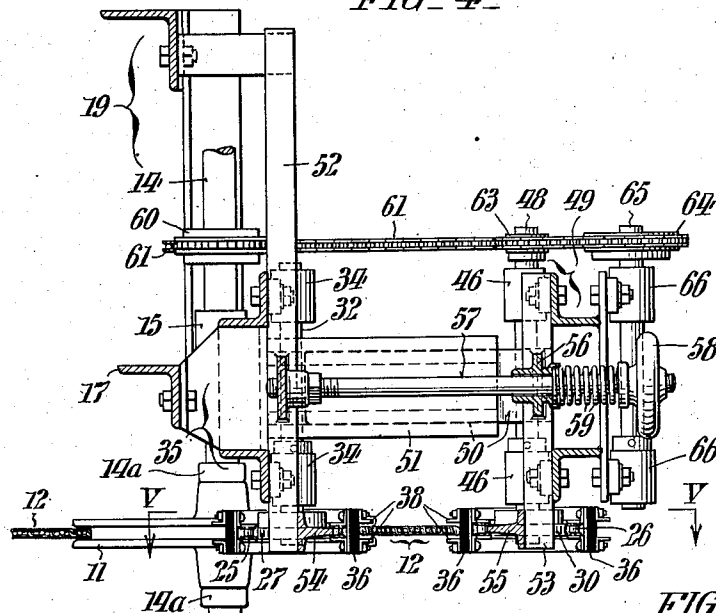


FIG. 6

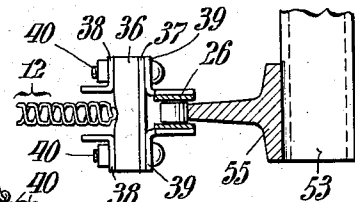
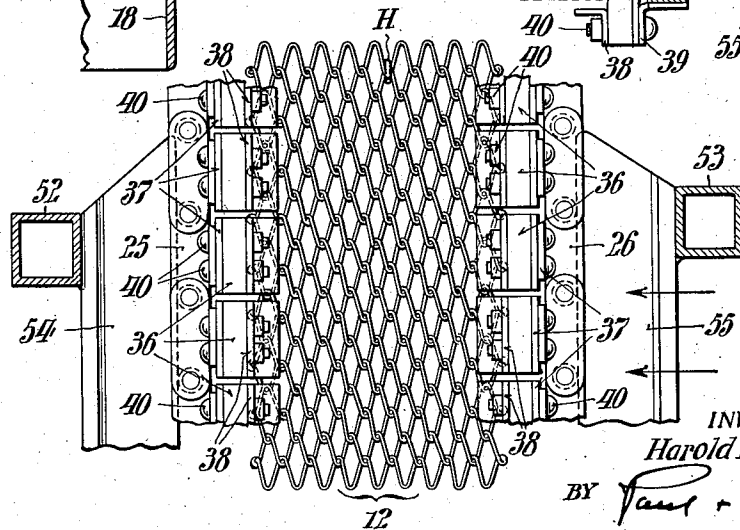


FIG. 5.



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CONVEYER BELT DRIVE MECHANISM

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8 Claims. (Cl. 198—203)

This invention relates to mechanism for driving conveyer belts. It has reference more especially to drive mechanism useful in conveying systems such as disclosed in a co-pending patent application, Serial No. 465,845 filed by me on November 17, 1942 and issued as Patent No. 2,352,840 on July 4, 1944, wherein a wire mesh conveyer belt passes edgewise about guide wheels by which its course of travel is in part defined, and wherein certain of the guide wheels serve as drivers for the belt. Under these conditions the driving effort is wholly exerted on one edge of the belt, with resultant imposition of strains tending to distort or twist it.

My present invention has for its chief objective to overcome the drawbacks above pointed out. This desideratum I attain in practice as hereinafter more fully set forth, through provision of an improved drive mechanism in which synchronously-operated powered sprocket chain caterpillar drive units frictionally engage the opposite side edges of the conveyer belt, with consequent uniform distribution of the strains in said belt so that distortion or twisting cannot occur.

In connection with drive mechanism having the foregoing attributes, I further aim to preclude, through provision of simple means such as also hereinafter disclosed for the purpose, slippage between the contacting surfaces of the caterpillar units and the edges of the conveyer belt while at the same time automatically compensating for wear as it occurs.

Other objects and attendant advantages will appear from the following detailed description of the attached drawings, wherein Fig. 1 is a horizontal section of a conveyer belt driving mechanism conveniently embodying my invention.

Fig. 2 is a detail view in elevation looking as indicated by the angled arrows II—II in Fig. 1.

Fig. 3 is a view partly in side elevation and partly in vertical section taken as indicated by the angled arrows III—III in Fig. 1.

Fig. 4 is a cross section taken as indicated by the angled arrows IV—IV in Fig. 1.

Fig. 5 is a horizontal section taken as indicated by the angled arrows V—V in Fig. 4; and

Fig. 6 is a detail cross sectional view of one of the caterpillar chains.

With more specific reference to these illustrations, the numerals 10 and 11 designate guide wheels or sheaves which are circumferentially grooved to receive one edge of the wire mesh belt conveyer 12 arranged for travel in a horizontal plane and provided at intervals with hooks H for

suspension of articles A therefrom. The shafts 13 and 14 of the guide wheels 10 and 11 are journaled in upper and lower bearings 15 and 16 respectively fixed to the horizontals 17 and 18 of a structural iron framework 19 which may be suitably supported from overhead or otherwise. For a reason which will be manifested later, the guide wheel 11 is arranged to rotate freely about the shaft 14 between a pair of collars 14a, the guide wheel 10 being however fixedly secured to its shaft 13. The belt 12 may be of any approved type capable of adapting itself to the guide wheels 10 and 11 as it passes edgewise about them. Preferably it is of the construction shown and described in my co-pending patent application hereinbefore referred to. Sagging of the belt 12 incident to rounding the guide wheels 10 and 11 is prevented by pairs of spaced superposed rollers 20 and 21 between which the outer edge of the belt passes, said rollers being journaled in brackets 22 and 23 extending from the framework 19 radially of the axes of said wheels, see Figs. 1 and 3.

The driving mechanism with which my present invention is more especially concerned includes a pair of caterpillar units respectively comprising comparatively short endless tractor belts in the form of chains 25 and 26 which are trained about sprocket wheels 27, 28 and 29, 30. As shown in Fig. 3, the sprocket wheels 27, 28 are secured to the lower ends of vertical shafts 31, 32 which are journaled in fixed bearings 33 and 34 on a supplemental frame 35 rigidly secured to the horizontal member 17 of the main supporting structure 19. The chains 25, 26 are identical in construction, being composed of links with attached resilient pads 36 (Figs. 5, 6) of rubber or the like for frictionally engaging the opposite edges of a portion of the belt 12—in the exemplified instance, that in the interval between the guide wheel 10 and 11. As shown, the resilient pads 36 are individually braced by backing plates 37 replaceably secured, together with upper and lower angle section guide pieces 38, to lugs 39 on the chain links by screw bolts 40. From Figs. 1, 2 and 4 it will be noted that the bearings 45 and 46 for the shafts 47, 48 of the sprocket wheels 29, 30 of the chain 26 are carried by a movable supplemental frame 49. Reaching laterally inward from the supplemental frame 49 is a pair of transversely-spaced tongues 50 which are slidably engaged in the longitudinal grooves of guides 51 secured to and projecting outward from the fixed supplemental frame 35. Attached respectively to laterally-spaced uprights 52 and

53 of the fixed and movable supplemental frames 35 and 49 are T-section bars 54 and 55 (Figs. 1, 4 and 6) whereof the central ribs serve as tracks for the rollers of the inside runs of the chains 25 and 26 of the two caterpillar units in the intervals between the sprocket wheels 27, 28 and 29, 30. Extending from the fixed supplemental frame 35 centrally between the guides 51 and passing freely through a clearance aperture in a cross member 56 of the movable supplemental frame 49, is a rod 57. The protruding end of this rod 57 is threaded and carries a hand wheel 58 whereof the hub is internally tapped to engage the rod threads; and disposed between the cross member 56 of the movable supplemental frame 49 and the hub of said hand wheel is a helical spring 59. The spring 59 is initially compressed to a definite degree by means of the hand wheel 58 to yieldingly urge the movable supplemental frame 49 inward relative to the fixed supplemental frame 35 so that, through the track bars 54 and 55, the resilient pads 36 on the links of the chains 25 and 26 of the two caterpillar units are maintained in effective gripping contact with the opposite side edges of the belt 12. The spring 59 also serves as a means to automatically compensate for wear between the contacting surfaces of the pads 36 and the belt edges. When necessary, further adjustments of the spring 59 may be made at suitable intervals. The drive mechanism is operated in the illustrated instance through application of power by suitable means (not shown) to the shaft 14 and motion communicated from a sprocket 60 affixed to said shaft through a chain 61 to sprocket pinions 62 and 63 respectively on the shafts 31 and 48 of the caterpillar chains 25 and 26. Through the medium of the idler 64, whereof the shaft 65 is journaled in bearings 66 on the movable supplemental frame 49, the chain 61 is so directed about the pinion 63 that the caterpillar chain 26 is driven in a direction opposite to that of the caterpillar chain 25, as required. It is to be especially noted, that the belt 12 is advanced solely by the two caterpillar units and not restrained in any way by the guide wheels 10 and 11, since the shaft 13 of the former is freely rotatable in its bearings 15 and 16, and since the latter is loose on the shaft 14 between the collars 14a. It is to be further noted that the guide pieces 38 on the links of the tractor chains 25 and 26 serve to prevent deviation of the straight run of the conveyer belt 12 from a horizontal plane in the interval between the guide wheels 10 and 11. The intergearing of the two caterpillar chains 25 and 26 may of course be accomplished in other ways than herein exemplified if found more convenient or desirable in practice, and the power for driving applied at another point as will be readily apparent to those skilled in the art.

While the drive mechanism of my present invention is particularly advantageous in connection with conveying systems such as disclosed in my co-pending patent application supra, it is of course not to be regarded as restricted to such use.

Having thus described my invention, I claim:

1. Drive mechanism for a relatively wide transversely-rigid flat horizontal conveyer apron, comprising a pair of caterpillar units with horizontally-arranged grooved endless supporting tractor belts running in lateral frictional pressure driving contact with the opposite side edges of the apron; and means for driving the tractor belts in unison so that their active runs move

in the direction in which said apron is to be progressed.

2. Drive mechanism for a relatively wide transversely-rigid flat horizontal conveyer apron, comprising a pair of caterpillar units with horizontally-arranged endless supporting tractor belts; means for driving the tractor belts in unison so that their active runs move in the direction in which the apron is to be progressed; and spring means operative transversely of the tractor belts for yieldingly maintaining their active runs in frictional pressure driving contact with the opposite side edges of the conveyer.

3. Drive mechanism for a relatively wide transversely-rigid flat horizontal conveyer apron, comprising a pair of caterpillar units with horizontally-arranged endless supporting tractor belts; means for driving the tractor belts in unison so that their active runs move in the direction in which the apron is to be progressed; spring means operative transversely of the tractor belts for yieldingly maintaining their active runs in pressure driving contact with the opposite side edges of the apron; and means for regulating the spring means to adjust the pressure of said tractor belts upon the apron.

4. Drive mechanism for a relatively wide transversely-rigid flat horizontal conveyer apron, comprising a pair of caterpillar units with horizontally-arranged endless supporting tractor belts; means for driving the tractor belts in unison so that their active runs move in the direction in which the apron is to be progressed; fixed and movable backing bars respectively for the active runs of the tractor belts; and means for exerting pressure upon the movable backing bars for maintenance of said belts yieldingly in frictional contact with the opposite side edges of the conveyer.

5. Drive mechanism for a relatively wide transversely-rigid flat horizontal conveyer apron, comprising a pair of caterpillar units with horizontally-arranged endless supporting tractor chains running in lateral frictional pressure driving contact with the opposite side edges of the apron; means for driving the tractor chains in unison so that their active runs move in the direction in which the apron is to be progressed; and resilient pads on the links of said chains to directly contact the side edges of the apron.

6. Drive mechanism for a relatively wide transversely-rigid flat horizontal conveyer apron, comprising a pair of caterpillar units with horizontally-arranged endless supporting tractor chains running in lateral frictional pressure driving contact with the opposite side edges of the apron; means for driving the tractor belts in unison so that their active runs move in the direction in which the apron is to be progressed; resilient pads of rubber or the like on the links of the chains for directly contacting the side edges of the apron; and guide elements on said chain links overreaching the apron edges both above and below.

7. Drive mechanism for a relatively wide flat transversely-rigid horizontal conveyer apron, comprising a pair of spaced vertical axis guide wheels with circumferential grooves for engaging an edge of the apron; a pair of horizontally-arranged caterpillar drive units with grooved endless tractor belts running in lateral frictional pressure contact with the opposite side edges of a straight run of the apron between the guide wheels; and gearing connections between one of the guide wheels and the tractor belts for actuat-

ing the belts in unison so that their active runs move in the direction in which said conveyer is to be progressed.

8. Drive mechanism for a relatively wide-flat horizontal apron conveyer of the character described trained to travel edgewise about a pair of spaced vertical axis guide wheels, said mechanism including a pair of horizontally-arranged caterpillar drive units with endless supporting tractor chains respectively running in lateral 10

pressure driving contact with the opposite side edges of a straight run of the apron conveyer between the guide wheels; and gearing connections between shafts whereon sprocket wheels for the respective tractor chains are mounted and a power shaft whereon one of the guide wheels is freely mounted, whereby the active runs of said tractor chains are motivated in unison in the same direction as the apron conveyer.

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