Oct. 13, 1953 W. F. BANKAUF 2,655,251

REVERSIBLE TRAINING IDLER

Filed June 3, 1950

Fig. 1.

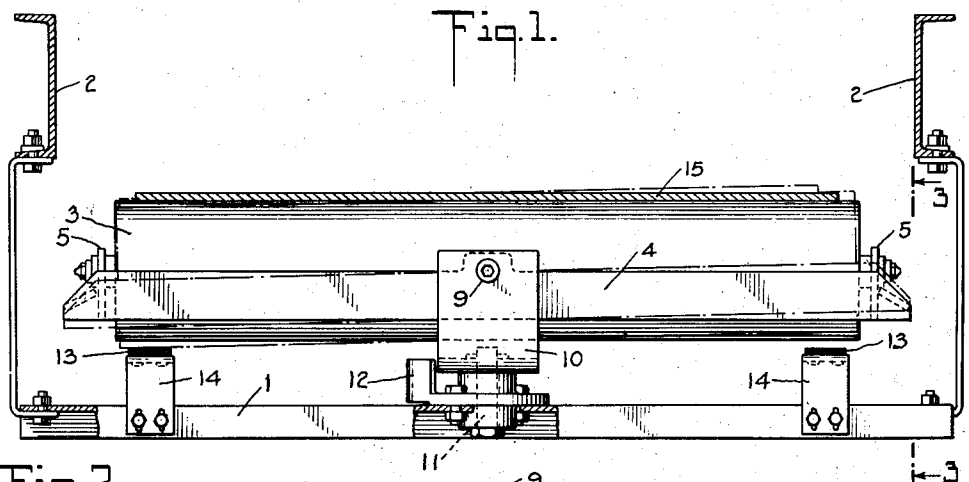


Fig. 2.

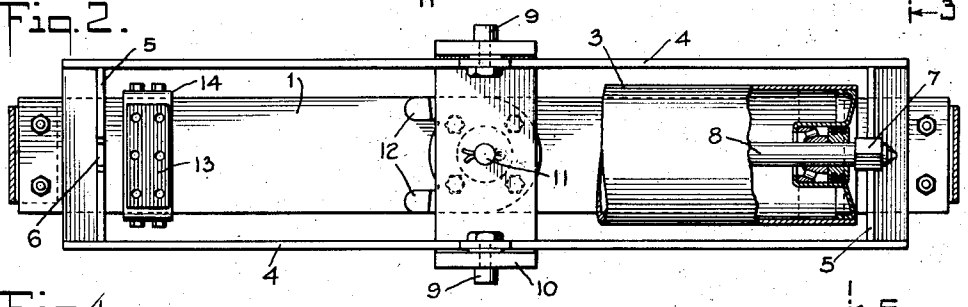


Fig. 4.

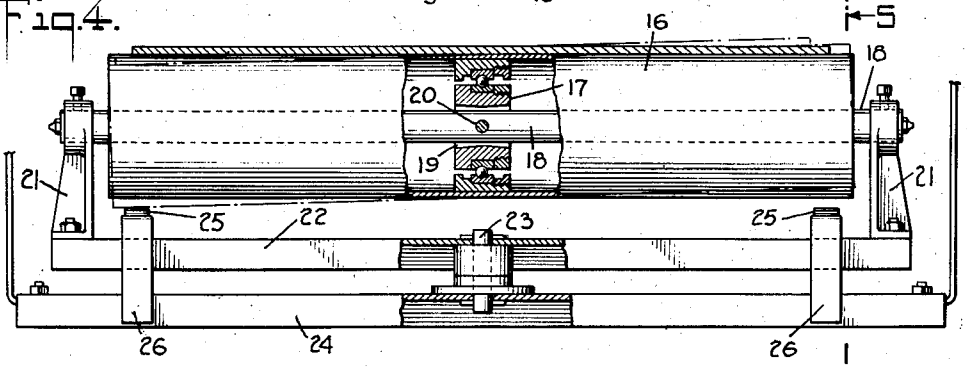


Fig. 3.

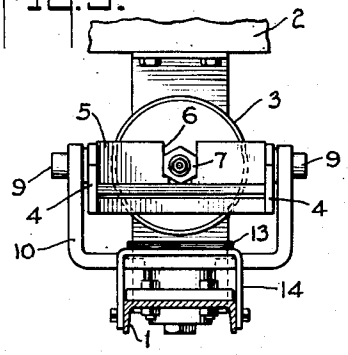
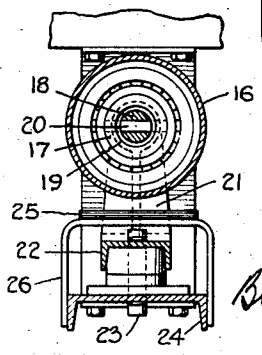


Fig. 5.



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REVERSIBLE TRAINING IDLER

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7 Claims. (Cl. 198—202)

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This invention relates to belt conveyor training idlers by means of which the tendency of a belt to wander laterally of its supporting idlers may be corrected automatically and the belt induced to return to its intended path. As is well known, such correction can be effected by means of an idler pulley or roller the axis of which, instead of being square to the line of travel of the belt, is advanced at that end of the roller toward which the belt is wandering.

The primary object of the invention is an improved roller mounting so organized as to cause the roller to assume the required training position automatically in time of need and, without attention or adjustment, to assume that position no matter in which direction the belt supported by the roller happens to be moving.

The invention will be readily understood from the description of the accompanying drawings in which:

Fig. 1 is a partially-sectioned elevation of a preferred form of roller mounting according to the invention;

Fig. 2 is a broken-out plan view of the same;

Fig. 3 is a vertical section on the line 3—3 of Fig. 1;

Fig. 4 is a partially-sectioned elevation of a modified construction; and

Fig. 5 is a vertical section on the line 5—5 of Fig. 4.

In the preferred form of Figs. 1–3, a base member 1 is shown suspended from the usual stringers 2; and the pulley or roller 3 is provided with a double pivotal support on the base.

To that end, the roller is supported within a box frame, consisting of the side members 4 and end members 5, the latter having upwardly opening cut-outs or sockets 6 to receive the end nuts 7 of the roller shaft 8.

Centrally of the side members 4 the box frame is trunnion supported, as at 9, at the upper ends of a yoke member 10, the pivot axis of the trunnions being arranged horizontally and at right angles to the shaft axis. The yoke member, in turn, is supported on the base with freedom to rotate about a central vertical pivot post 11, the turning movement permitted the yoke, box frame and roller being limited by upstanding lugs 12.

Supported on the base 1 beneath the roller are stationary shoes, which preferably consist of pads 13 of brake lining or other friction material mounted on brackets 14. These brackets are adjustable to space the shoes from the normal horizontal axis of the shaft a distance slightly greater than the radius of the roller; in other words to clear the roller when it is horizontal.

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When the belt 15 works or wanders to one side or the other (say, to the left, in Fig. 1) it unbalances the roller and rocks it about its trunnions 9; and, as indicated by the dotted outline, the underside of the low end of the roller makes contact with one of the shoes 13. The rotation of the roller while abutting the shoe surface causes that end of the roller to walk forward (in the direction of belt travel) the box frame 4 and yoke 10 turning about the vertical pivot post 11. The roller thus assumes a skew position appropriate to direct the belt back toward the center of the roller. It will be noted that the action is quite automatic, without regard to the direction of travel of the belt. No matter which way the belt is moving, the end of the roller toward which the belt is wandering always moves forward, as is required.

It will be noted that while the axes of trunnions 9 and vertical pivot post 11 intersect substantially at the center, that is, the center of gravity, of roller 3, the trunnions 9 are located high up with respect to the box frame 4, 5. In other words, the center of gravity of the roller and frame, considered as a unit, is substantially below the trunnion or horizontal pivot axis. This arrangement imparts to the roller and frame a greater tendency to return to their normal horizontal position as soon as the belt has moved back to its centered position.

In the form of the invention shown in Figs. 4 and 5, the roller 16 is provided with a single, centrally located, internal bearing, the inner member 17 of which encircles the shaft 18 and with clearance, as at 19. A horizontal pivot pin 20 supports the roller on the shaft.

The protruding ends of shaft 18 are secured in pedestals 21 upstanding from a frame member 22 which, like the yoke 10, is mounted to rotate about a central, vertical pivot post 23 supported on the base 24. As in the previously described form, shoes 25 are provided, the shoe brackets 26 in this instance straddling the frame member 22 and limiting its rotation about pivot post 23.

It will be noted that, in this form, the roller rocks about the axis of pivot pin 20 while the roller shaft 18 remains horizontal; but, as before, the engagement of the rotating roller with one or the other of the shoes causes the roller to rotate bodily about pivot post 23 into the position required to train the belt, no matter which way it is moving.

In the light of the foregoing description of

illustrative embodiments of the invention, the following is claimed:

1. A mounting for a conveyor belt roller having protruding shaft portions at its ends comprising: a frame incorporating supports for said shaft portions; horizontal trunnions for the frame having their axis normal to the axis of the shaft portions and intersecting the same midway between the shaft supports; a yoke supporting the trunnions; a base member; a central, vertical pivot post connecting the yoke and base member; and friction shoe means supported on the base member on opposite sides of the pivot post beneath the shaft axis and normally spaced therefrom a distance slightly greater than the radius of the roller to be supported.

2. A conveyor belt roller mounted with freedom to rock about the axes of a double pivotal support, one pivot axis extending horizontally and at right angles to the roller axis and the other pivot axis extending vertically, and stationary shoe means located adjacent but spaced from the roller on opposite sides of the first-mentioned pivot axis for alternative engagement by the roller in response to movement thereof about such first-mentioned axis.

3. A conveyor belt roller mounted with freedom to rock about the axes of a double pivoted support, one pivot axis extending horizontally and at right angles to the roller axis and the other pivot axis extending vertically, each of said axes being located midway between the ends of the roller, and said pivot axes intersecting substantially at the center of gravity of the roller; and friction shoe means located adjacent and spaced lengthwise of the roller on opposite sides of its center of gravity.

4. The combination of a conveyor belt roller support; a roller mounted thereon; centrally located horizontal and vertical pivots for said support, said horizontal pivots being at right angles to the roller axis and above the center of gravity of the combined roller and support; and stationary friction shoe means beneath the roller on opposite sides of said pivots.

5. A conveyor belt roller mounted with freedom to rock about the axes of a double pivotal support located substantially midway between the ends of the roller, one pivot axis extending horizontally and at right angles to the roller axis and the other pivot axis extending vertically, and stationary shoe means located beneath and adjacent but spaced from the roller on opposite sides of the first-mentioned pivot axis for alternative engagement by the roller in response to movement thereof about such first-mentioned axis.

6. A conveyor belt roller mounted with freedom to rock about the axes of a double pivotal support, one pivot axis extending horizontally and at right angles to the roller axis and the other pivot axis extending vertically, and stationary shoe means located beneath and adjacent but spaced from the roller on opposite sides of the first-mentioned pivot axis for alternative engagement by the roller in response to movement thereof about such first-mentioned axis.

7. A conveyor belt roller mounted with freedom to rock about the axes of a double pivotal support, one pivot axis extending horizontally and at right angles to the roller axis and the other pivot axis extending vertically, each of said axes being located midway between the ends of the roller, and said pivot axes intersecting substantially at the center of gravity of the roller; and friction shoe means located adjacent the lower surface and spaced lengthwise of the roller on opposite sides of its center of gravity.

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