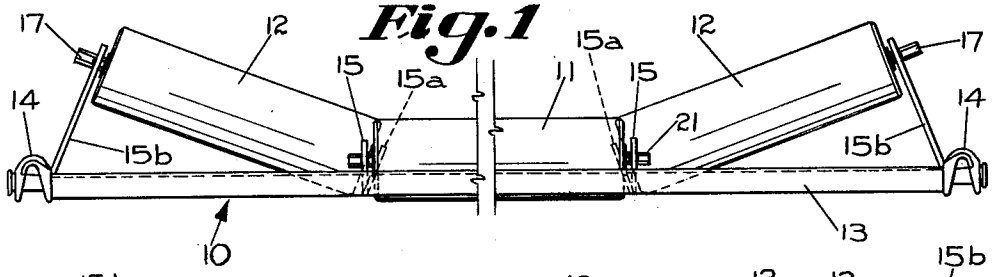
Nov. 17, 1964 J. BAY 3,157,272

CLIP UNIT FOR HOLDING REMOVABLE AND REPLACEABLE IDLER ROLLERS IN A MOUNTING STAND

Filed May 1, 1961

Fig. 1



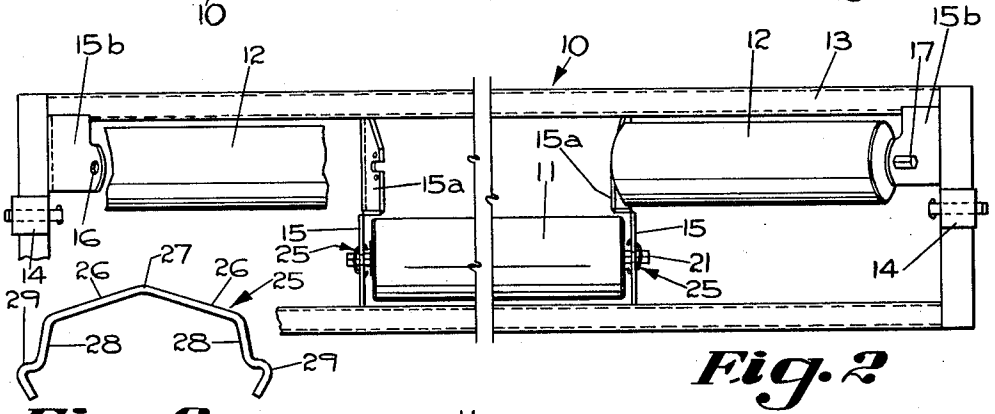


Fig. 2

Fig. 6

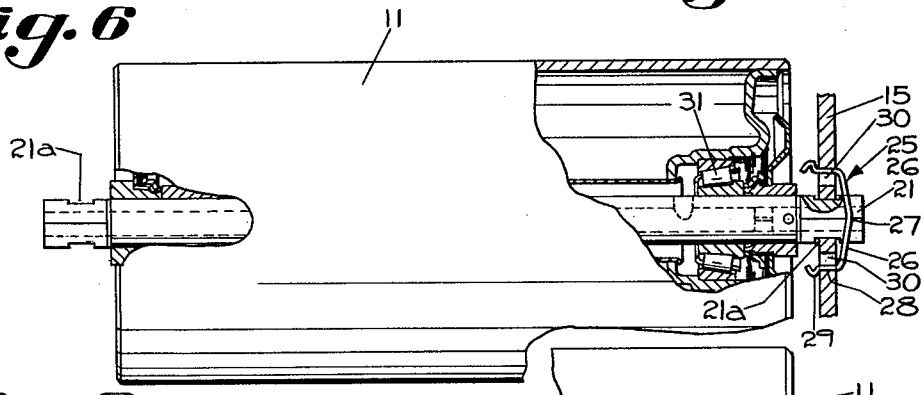


Fig. 3

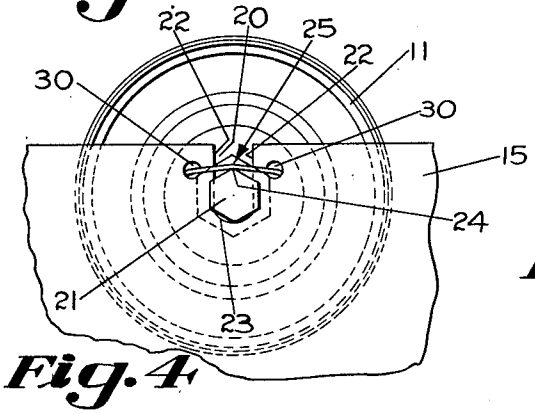


Fig. 4

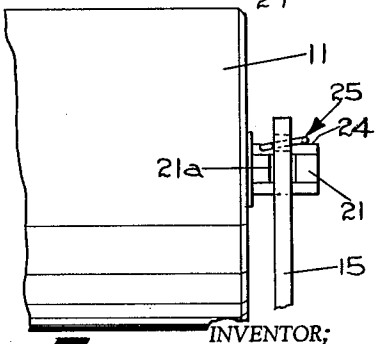


Fig. 5

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CLIP UNIT FOR HOLDING REMOVABLE AND REPLACEABLE IDLER ROLLERS IN A MOUNTING STAND

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1 Claim. (Cl. 198—192)

This invention relates to a clip unit for holding removable and replaceable idler rollers in a mounting stand.

More specifically, it relates to conveyers which include idler rollers that are mounted on supporting stands incorporated in suitable conveyer systems. It is desirable in systems of this type to have the idler rollers mounted in such a manner that they can be removed and replaced easily as the occasion demands by the use of simple tools and with a minimum of labor and effort. Therefore, there is a need for a simple and inexpensive structure which will ordinarily effectively hold the idler roller in position on the stand for proper operation but which will permit ready removal when it is desired to remove and replace the roller because of wear or other factors.

The present invention provides a very simple and inexpensive clip and cooperating roller supporting stand unit which will effectively retain the roller in position for normal operation but which will provide for removal and replacement thereof in a simple and expeditious manner.

Various other objects will be apparent from the drawing and the following description.

The accompanying drawing shows a preferred embodiment of this invention and in this drawing:

FIGURE 1 is a side elevational view of a roller supporting stand in which this invention is embodied.

FIGURE 2 is a plan view, partly broken away, of the stand of FIGURE 1.

FIGURE 3 is a view partly in elevation and partly in section of a roller and an associated stand support illustrating this invention.

FIGURE 4 is an end view of the structure illustrated in FIGURE 3.

FIGURE 5 is a detail of the structure of FIGURE 4 taken at right angles thereto.

FIGURE 6 is a plan view of the clip of this invention.

With reference to the drawing, this invention is shown incorporated in an idler-supporting conveyer stand 10 of a suitable type although it is to be understood that this stand is shown for illustrative purposes only and that this invention is not limited to the specific form of stand shown. The stand 10 is shown as supporting a central horizontally disposed roller 11 and the outer inwardly inclined rollers 12. Each of these rollers is an idler roller.

The stand 10 comprises a horizontal base 13 which may be attached to a suitable support (not shown) by means of the fasteners 14 of any suitable type at the opposed outer ends thereof. The central roller 11 is shown as being suported by two identical upstanding cradle brackets 15 whereas each of the outer rollers 12 is shown as being supported by the upstanding inner cradle bracket 15*a* and the upstanding outer bracket 15*b*. The brackets 15*b* and 15*a* lean inwardly to support the roller 12 with its axis at an angle from the horizontal as indicated in FIGURE 1. Each of the outer brackets 15*b* is provided with an opening 16 into which the outer extended end 17 of the shaft of the roller 12 is slipped. The cradle brackets 15 and 15*a* are are substantially identical with the exception that the brackets 15*a* is angled inwardly slightly, as indicated in FIGURES 1 and 2. Therefore, the cradle bracket 15 will be the only one described in detail and this bracket is illustrated best in FIGURES 3, 4 and 5.

Each of the cradle brackets 15 is formed of a flat upstanding plate portion which has an upwardly opening notch 20 for receiving and cradling the extended end 21 of the shaft or axle of the roller 11. The notch 20 preferably has straight upstanding sides 22 and a curved inner or bottom end 23. The roller shaft extension 21 is preferably of angular form so that when it is slipped into a cradling notch 20 it will not rotate therein, due to the fact that the straight sides 22 will embrace adjacent flat sides of the shaft extension 21. The shaft is preferably hexagonal so that when it is positioned in the cradling notch 20, the vertex of the angle at the rib between the two upper sides thereof points upwardly as indicated at 24. The shaft extension 21 may be provided with a groove 21*a* to cooperate with the bracket to prevent axial movement of the shaft extension in the notch 20.

For holding each of the shaft extensions 21 in its cradling bracket 15, a simple spring clip 25 is provided and this spring clip 25 is indicated in FIGURE 6. It is preferably made of spring steel formed into the configuration shown in FIGURE 6, all portions of which lie in a single flat plane. This clip configuration provides a clip with an intermediate spring portion comprising main spring arms 26 which are angularly disposed with the outwardly directed angle 27 formed therebetween. At the outer end of each arm 26 a sharply bent inward leg 28 is provided on each arm 26 and each leg 28 has a terminal retaining shoulder 29 formed therein. Thus, the spring clip 25 is of substantially U-form in a flat plane with an outward bend or angle at the midpoint of the closed part of the U and with terminal retaining shoulders 29 at the outer ends of the U.

In association with the cradling notch 20 of the bracket 15 a pair of openings or apertures 30 is provided for receiving the legs 28 of the U-shaped clip 25. These openings or apertures 30 are spaced laterally outwardly of the corresponding straight sides 22 of the notch 20 and slightly below the upper end of the notch or upper edge of the bracket 15. After the shaft extension 21 is positioned in the notch, as indicated in FIGURES 3, 4 and 5, the legs 28 of the clip 25 are inserted inwardly through the openings or apertures 30. The openings or apertures 30 are sufficiently large to permit passage of the terminal retaining shoulders 29 of the spring clip, it being necessary to spring the legs 28 inwardly toward each other, by yieldably deforming the intermediate portion of the spring clip 25, to permit insertion of the legs 28 in the openings or aperture 30. As soon as the terminal retaining shoulders 29 pass completely through the openings, the legs 28 of the clip 25 will spring outwardly so that the terminal retaining shoulders 29 will engage the opposite side of the bracket 15 at its inner surface to retain the clip 25 in position as shown in FIGURE 3. It will be noted from FIGURE 5 that with the shaft extension 21 resting on the curved bottom edge 23 of the notch 20, the uppermost portion of each opening 30 is at a level slightly lower than the vertex of the rib 24 of the shaft. This will cause the arms 26 of the clip 25 to extend downwardly and inwardly at an angle relative to the axis of the shaft extension 21 through the openings 30 when the angle 27 of the clip engages the shaft rib 24. Thus, any tendency of the shaft extension 21 to rise in the notch 20 will cause the legs 28 of the clip to move farther into the openings rather than to withdraw the leg 28 from the openings.

It will be apparent that with this structure, the shaft extension can be slipped easily into the cradling notch 20 adapted to receive it. As pointed out above, these notches 20 may be provided at one or both ends of the roller. The spring clip 25 can then be inserted quickly and with ease and without special tools into the receiving and retaining openings 30. Thereafter, the spring clip 25 will hold the shaft extension 21 in its cradling notch 20 and any tendency for the shaft extension to lift

will merely increase the holding effect of the clip. The spring clip 25 can be removed easily by pulling it out of the opening or apertures 30 with a screwdriver, pliers, or other simple tool.

Although the particular bearing structure for mounting the roller 11 on the shaft, which has the extension 21, is not important, an antifriction bearing arrangement for this purpose is shown in FIGURE 3. This bearing arrangement is shown as comprising a roller bearing 31 of any suitable type but the details of this bearing will not be described since they are not important to this invention. Any suitable bearing structure may be provided for rotatably mounting the roller on its associated shaft.

It will be apparent that this invention provides a simple clip and associated cradling bracket structure for removably retaining the shaft of an idler roller in position. Many advantages of this unit have been discussed above and others will be apparent.

Having thus described this invention, what is claimed is:

In combination with a roller having a shaft extending from an end of the roller, a bracket for supporting the roller, said bracket having a notch in which the shaft is received, the roller being disposed at one side of the bracket, and the shaft extending from the roller through the notch to the opposite side of the bracket to provide an exposed end of the shaft at the opposite side of the bracket, an aperture in the bracket at each side of the notch, a spring clip for retaining the shaft in the bracket notch, said spring clip being a planar element that is symmetrically formed in a single plane about a line which is in alignment with the shaft axis when the spring clip is engaged with the shaft, said planar spring clip including an intermediate spring portion extending across the exposed end of the shaft and in engagement therewith to retain the shaft in the bracket notch, said intermediate spring portion of the spring clip having oppositely directed main spring arms extending to opposite sides of the shaft from a junction of said arms at the line of symmetry of the spring clip, each main spring arm including a leg extending through the apertures from said opposite side of the bracket to said one side thereof facing the roller, each leg having a terminal shoulder directed outwardly from the line of symmetry of the spring clip, each said terminal shoulder engaging said one side of the bracket facing the roller, and said intermediate spring portion of the spring clip being yieldably deformed by insertion of said legs into said apertures, said intermediate spring portion of the spring clip engaging the shaft at the junction of the main spring arms with the terminal shoulders being sprung into engagement with the bracket as aforesaid, said apertures being disposed substantially in alignment with the top of the exposed end of the shaft, and the spring clip laying in a plane which is slightly inclined with respect to the axis of the shaft and any tendency of the shaft to ride up in the notch causing the spring clip to be further inclined with respect to the axis of the shaft whereby the spring clip exerts a greater resistance tending to hold the shaft in the notch.

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