Oct. 30, 1945. K. EGGE 2,387,890

ROLL CHANGING DEVICE

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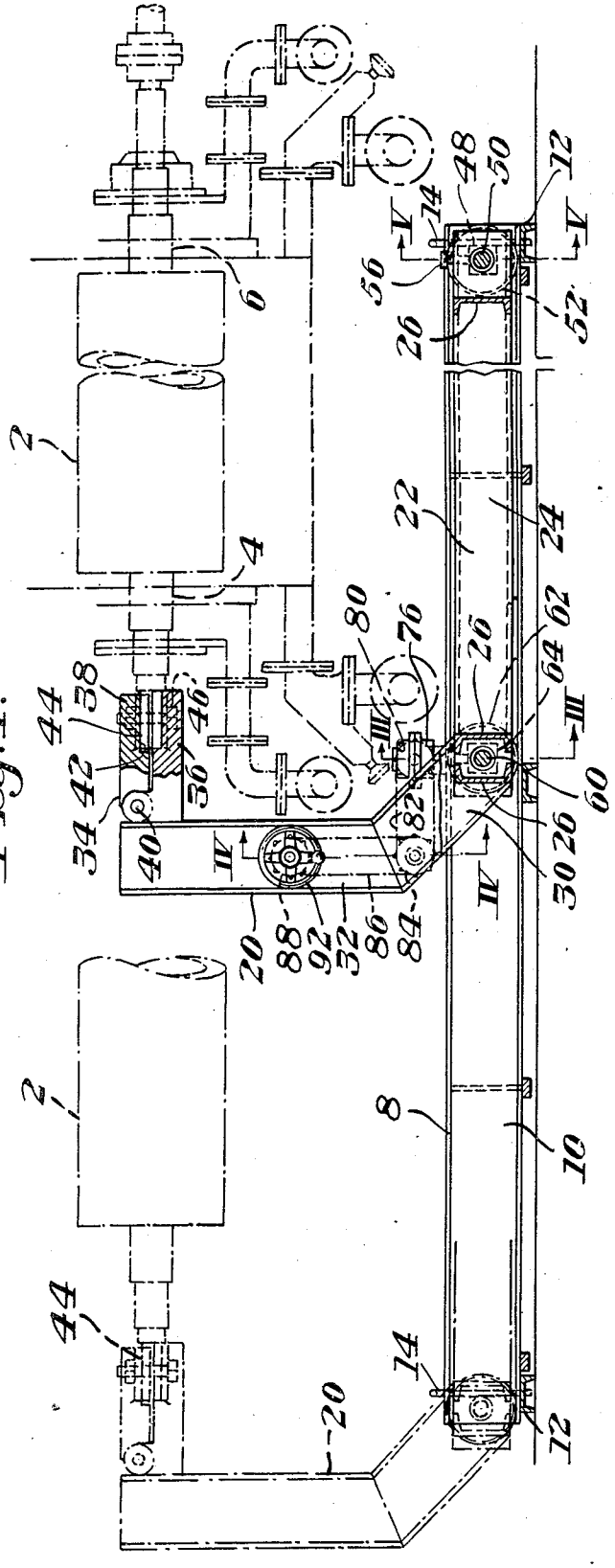


Fig. 1.

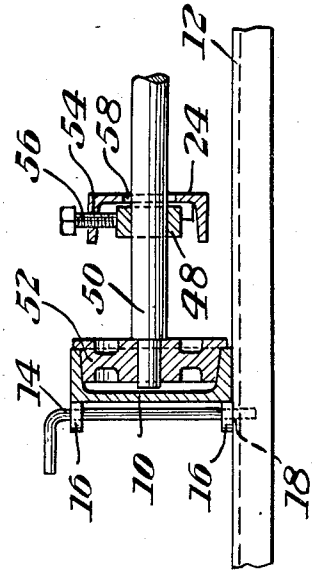


Fig. 5.

INVENTOR
KLAUS EGGE,
by: John E. Jackson
his Attorney.

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Fig. 2.

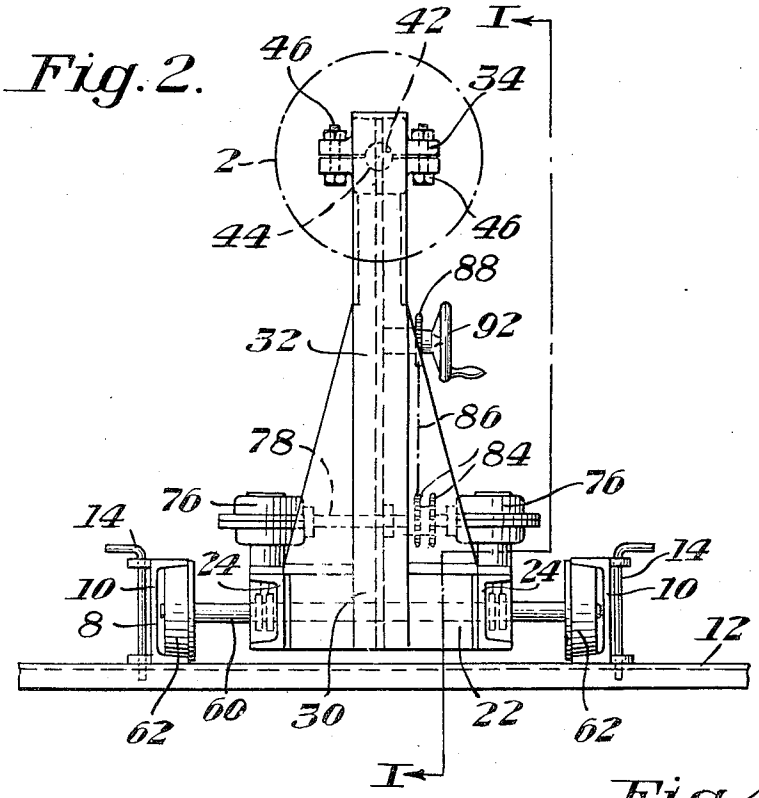


Fig. 4.

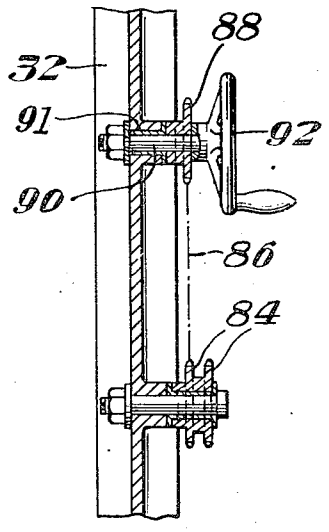
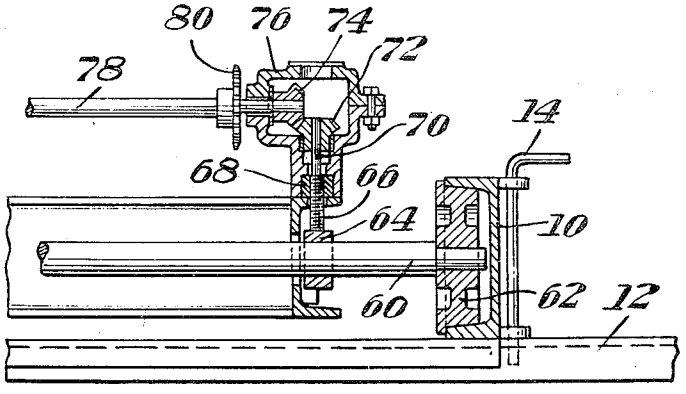


Fig. 3.



INVENTOR
KLAUS EGGE,
by: John E. Jackson
his Attorney.

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UNITED STATES PATENT OFFICE

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ROLL CHANGING DEVICE

Klaus Egge, Mount Lebanon, Pa., assignor to Carnegie-Illinois Steel Corporation, a corporation of New Jersey

Application December 3, 1943, Serial No. 512,818

5 Claims. (Cl. 214—1)

This invention relates to a roll changing device, especially for changing rolls which must be removed laterally from the processing line and in which there is very little clearance for such removal.

In many processing lines, such as units for plating, pickling, scrubbing and cleaning, the rolls extend transversely of the processing line. In many instances the roll, or other device such as brushes, cannot be removed in a vertical direction, but must be removed horizontally from the line. Such sidewise removal of highly finished rolls, brushes, etc., presents difficulties in that unless the removal is within close tolerances, the surface of the equipment being removed or inserted is liable to contact adjacent parts and be damaged.

It is an object of this invention to provide apparatus for removing and inserting rolls and the like in a sidewise manner into and out of processing equipment where vertical or overhead insertion and removal is impracticable or impossible.

Another object is to provide such apparatus which holds the vertical and horizontal movement of the roll within very close predetermined dimensional tolerances.

These and other objects will become more apparent after referring to the following specification and attached drawings, in which:

Figure 1 is a vertical cross sectional view taken on the line I—I of Figure 2;

Figure 2 is an end view of Figure 1;

Figure 3 is a sectional view on the line III—III of Figure 1;

Figure 4 is a sectional view taken on the line IV—IV of Figure 1; and

Figure 5 is a sectional view taken on the line V—V of Figure 1.

Referring more particularly to the drawings, the reference numeral 2 indicates a roll in a processing line, the roll being supported in bearings 4 and 6. The roll is prevented from being removed vertically by housings and other parts (not shown) of the processing line. The roll changing device is supported by a rigid portable frame 8 which consists of two spaced parallel channels 10 fastened together and having their flanges facing each other. These channels are fastened to the floor 12 by means of removable positioning pins 14 slidably supported in brackets 16 on the channels and extending into holes 18 in the floor. The flanges of the channels 10 act as tracks for the L-shaped carriage 20 which has a horizontal leg 22 formed from a pair of spaced parallel channel members 24 connected by channels 26. The vertical leg 28 is made from I-beams 30 and 32. Attached to the top of the vertical leg 28 is a clamping device 34 which consists of a rigid jaw 36 and a movable jaw 38 pivotally connected thereto by means of pin 40, the jaws having an opening 42 therein for receiving the end 44 of the roll 2. Bolts 46 clamp the two jaws together to support the roll. The free end of the horizontal leg 22 is provided with bearings 48 which receive the axle 50, the outer ends of which carry the wheels 52 which are supported on the flanges of channel 10. The top flange of each of the channels 24 has threaded opening 54 therein to receive the screw 56 which supports the bearing 48. Holes 58 in the web of the channels 24 permit vertical adjustment of the carriage with respect to the axle 50 by means of the screw 56. A similar axle 60 having wheels 62 on the outer ends thereof is provided adjacent the vertical leg 28. This axle is journaled in bearings 64 supported by screws 66 which are threadedly received in the stationary nuts 68 at each side of the carriage. Each of the screws 66 has an extension 70 thereon which carries a bevel gear 72 which meshes with another bevel gear 74, both gears being enclosed in the casing 76. The gears 74 are carried by the shaft 78 which also carry a sprocket 80. This sprocket is rotated by means of chain 82, double sprocket 84, chain 86, and sprocket 88, fastened to shaft 90 supported by bearing 91 in I-beam 32. A hand wheel 92 is rigidly connected to the shaft 90.

The operation of the device is as follows:

When it is desired to remove the roll 2 from the processing line, the frame 8 is secured to the floor in the desired position as shown in Figure 1 by means of the locking pins 14 inserted into the holes 18 in the floor. The carriage 20 is supported by the flanges of the channels 10 and moved to the position shown in full lines in Figure 1. It will be understood that the bearing caps, and any other apparatus preventing sidewise movement of the roll, will have been removed. By turning the hand wheel 92, the axis of the clamping device 34 is raised or lowered so that it will coincide with the axis of the roll 2 when the roll is supported in its bearings. The end 44 of the roll 2 is received by the jaws 36 and 38 and the jaws clamped together by means of bolts 46. The roll 2 is of such weight that the end opposite that of the clamping device is deflected when not directly supported and, before removing the roll, it is necessary to elevate the free end of the horizontal leg 22 so that the axis of the roll 2 will remain horizontal when removed

from the bearing 6. This is accomplished by rotating the screws 56 shown in Figure 5. Thus by the predetermined adjustments of the two opposite ends of the carriage, it is possible to compensate for and remove the weight of the rolls, brushes, etc., from the bottom of the bearings and to assure exact positioning of the clamp 34 so that the vertical position of the roll is within the necessary close and predetermined tolerances. The carriage 20 carrying the roll 2 is then moved outwardly to the position shown in broken lines in Figure 1. In replacing the roll, the roll is grasped by the clamp 34 and the ends of the carriage are adjusted so that the axis of the roll 2 coincides with the axis of the roll when positioned in the processing line.

While one embodiment of the invention has been shown and described, it will be apparent that other modifications and adaptations may be made without departing from the scope of the following claims.

I claim:

1. A handling device for removing and replacing horizontal rolls and the like in their bearings comprising a carriage, an upright carried by said carriage, a gripping device on said upright for engaging an end portion of the roll to support it in substantially horizontal position, said carriage having an elongated substantially horizontal leg, means on said carriage beneath said gripping device for raising and lowering one end of said carriage, and means on said leg for raising and lowering the other end of said carriage to keep the roll axis substantially horizontal when it is removed from its bearings.

2. A handling device for removing and replacing horizontal rolls and the like in their bearings comprising a carriage, an upright carried by said carriage, a gripping device on said upright for engaging an end portion of the roll to support it in substantially horizontal position, said carriage having an elongated substantially horizontal leg, a pair of spaced apart axles adjustably attached to said leg, wheels on said axles for moving said carriage longitudinally, means on said carriage beneath said gripping device for raising and lowering one end of said carriage, and means on said leg for raising and lowering the other end of said carriage to keep the roll axis substantially horizontal when it is removed from its bearings.

3. A handling device for removing and replacing horizontal rolls and the like in their bearings comprising a carriage, an upright carried by said carriage, a gripping device on said upright for engaging an end portion of the roll to support it in substantially horizontal position, said carriage having an elongated substantially horizontal leg, a pair of spaced apart axles adjustably attached to said leg, wheels on said axles for moving said carriage longitudinally, means on said carriage beneath said gripping device for raising and lowering one end of said carriage, means on said leg for raising and lowering the other end of said carriage to keep the roll axis substantially horizontal when it is removed from its bearings, and a portable track for said wheels.

4. A handling device for removing and replacing horizontal rolls and the like in their bearings comprising a substantially L-shaped carriage having vertical and horizontal legs, a gripping device on said vertical leg for engaging an end portion of the roll to support it in substantially horizontal position, said gripping device extending in the same direction as the horizontal leg, means on said carriage beneath said gripping device for raising and lowering one end of said carriage and means on said horizontal leg for raising and lowering the other end of said carriage to keep the roll axis substantially horizontal when it is removed from its bearings.

5. A handling device for removing and replacing horizontal rolls and the like in their bearings comprising a substantially L-shaped carriage having vertical and horizontal legs, a gripping device on said vertical leg for engaging an end portion of the roll to support it in substantially horizontal position, said gripping device extending in the same direction as the horizontal leg, a pair of spaced apart axles adjustably attached to said horizontal leg, wheels on said axles for moving said carriage longitudinally, and means on said carriage for selectively raising and lowering each end of said carriage to keep the roll axis substantially horizontal when it is removed from its bearings.

KLAUS EGGE.