Dec. 23, 1952 E. T. LORIG 2,622,875

PIVOTED AUTOMATIC PINCH ROLL ARRANGEMENT FOR CONTINUOUS PROCESSING LINES

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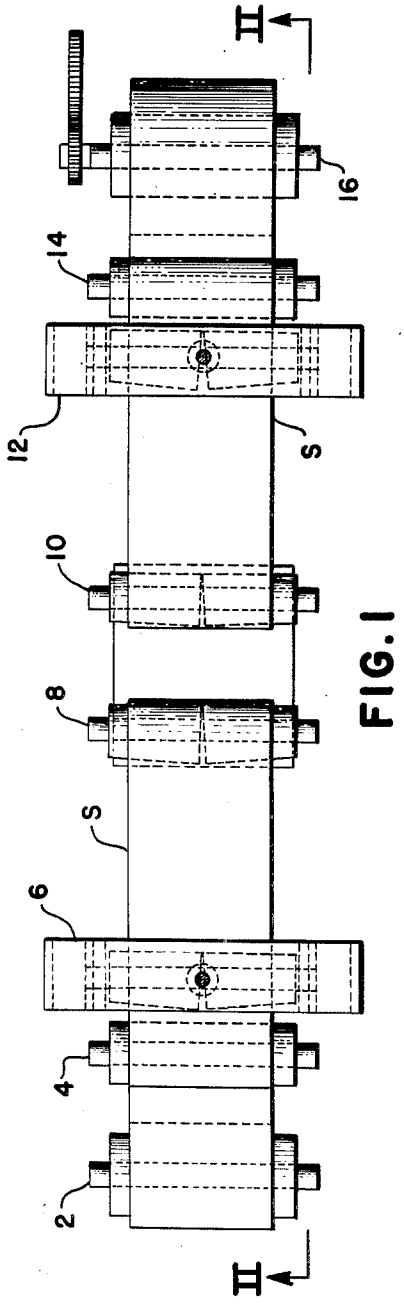


FIG. 1

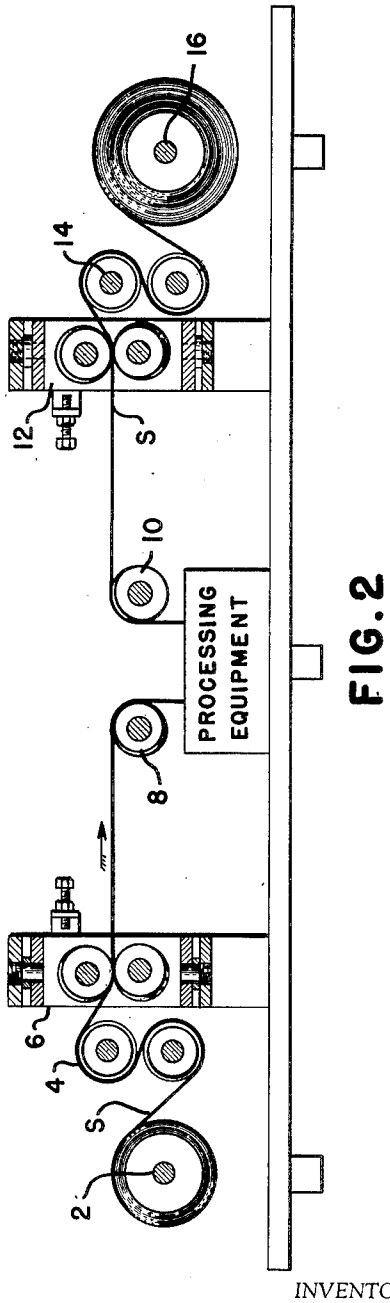


FIG. 2

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FIG. 4

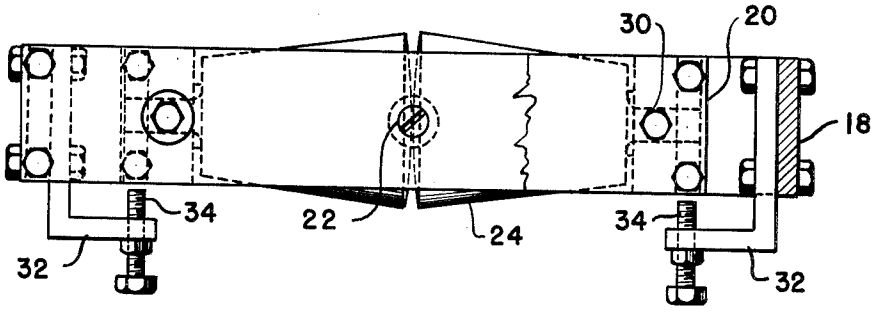
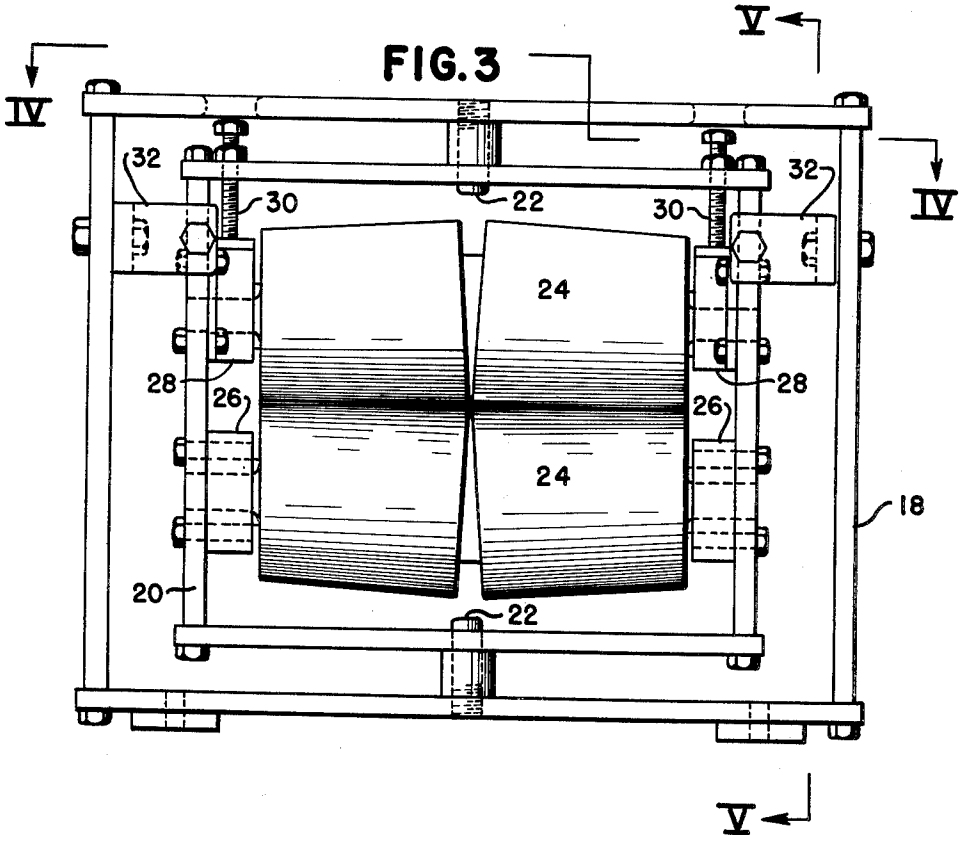


FIG. 3



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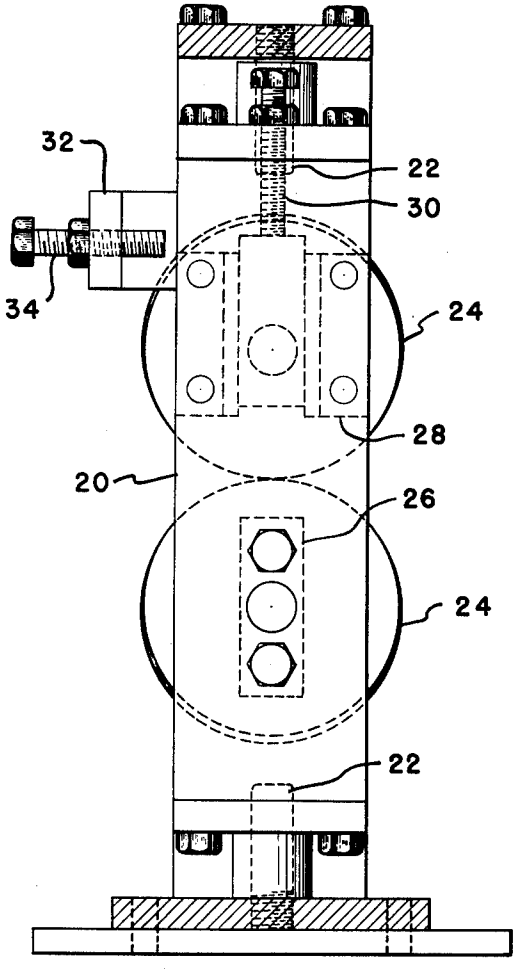
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FIG. 5



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UNITED STATES PATENT OFFICE

2,622,875

PIVOTED AUTOMATIC PINCH ROLL ARRANGEMENT FOR CONTINUOUS PROCESSING LINES

Edwin T. Lorig, Ross Township, Allegheny County, Pa., assignor to United States Steel Company, a corporation of New Jersey

Application August 23, 1950, Serial No. 181,056

4 Claims. (Cl. 271—2.6)

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This invention relates to a pivoted automatic pinch roll arrangement for continuous processing lines. In continuous strip processing lines such as electrolytic tinning and pickling lines the strip is conveyed over rolls in the uncoiled condition. Because of various factors in the processing equipment and in the strip itself there is a tendency for the strip to work across the face of the roll. In order to keep the strip centered I have developed self-centering rolls such as disclosed in my copending applications, Serial No. 97,218, filed June 4, 1949, now Patent No. 2,593,157, Serial No. 138,389, filed January 13, 1950, now Patent No. 2,592,581, and Serial No. 145,648, filed February 23, 1950, now Patent No. 2,593,158. While these rolls satisfactorily center the strip in many instances, I have found that in other instances the strip tends to weave unless extremely high tensions are used. This is undesirable from an operating standpoint. In some instances the processed strip is recoiled and the weaving effect results in a non-uniform coil.

It is therefore an object of my invention to provide apparatus which will automatically center and align the strip in a continuous processing line.

Another object is to provide such apparatus which permits the strip to be recoiled in such a manner that the edges of the coil are substantially uniform.

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

Figure 1 is a plan view of a strip processing line embodying my invention;

Figure 2 is a sectional view taken on the line II—II of Figure 1;

Figure 3 is an elevation of a pair of pivoted pinch rolls of my invention;

Figure 4 is a view taken on the line IV—IV of Figure 3; and

Figure 5 is a view taken on the line V—V of Figure 3.

Referring more particularly to Figures 1 and 2 of the drawings, the reference numeral 2 indicates an uncoiler for supporting a coil of strip S which is to be processed. The strip S passes over a pair of bridle rolls 4 and then downwardly at an angle into a pair of pivoted pinch rolls 6 which will be described in detail later. The strip preferably enters the pinch rolls 6 at an angle of between 20 and 40° from the horizontal and leaves the pinch rolls horizontally. The strip then passes over a roll 8 into the processing equipment. The type of processing is not important and it is therefore not shown in detail. After passing through the processing equipment, the strip S passes upwardly over another roll 10 into another pinch roll unit 12 which is substantially the same as pinch roll unit 6. From here the strip S passes over bridle rolls 14 and is wound on a coiler 16. It will be noted that the strip enters the pinch roll unit 12 horizontally and leaves it at an angle between approximately 20 and 40° from the horizontal.

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As shown in Figures 3, 4 and 5, the pinch roll units 6 and 12 each include a stationary support 18 in which is pivotally mounted the roll housing 20 by means of aligned pins 22 arranged on the vertical center line of pinch rolls 24. These pinch rolls 24 are automatically centering rolls preferably of the type disclosed in my above mentioned copending applications. The bottom roll 24 is mounted in bearings 26 on the housing 20 and the top roll 24 is mounted in bearings 28 which are slidably mounted on the housing 20. Screws 30 are provided for adjusting the position of the upper roll 24 and hence the pressure on the strip passing between the pinch rolls 24. A pair of brackets 32 is mounted on the support 18. Each of the brackets 32 is provided with an adjustable stop 34 which is in alignment with the housing 20.

The operation of the device is as follows:

The strip S being processed is threaded through the line to the coiler 16 which is then started in operation. The stops 34 prevent undue pivoting of the housing 20, especially during the threading operation. During actual operation of the processing line the amount of movement of the housing 20 is very slight but is sufficient to maintain uniform tension on both edges of the strip. While two pinch roll units are shown, good results are obtained in many instances by the use of only one pinch roll unit.

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

I claim:

1. In a continuous strip processing line in which the strip passes through processing equipment, the improvement comprising a pair of pinch roll units one on each side of the processing equipment, each of said pinch roll units comprising a stationary support, a roll housing pivotally mounted on said stationary support, a pair of spaced apart bearings mounted in said housing on each side of the path of travel of said strip, and a pair of automatically centering pinch

rolls mounted in said bearings through which the strip passes, the axes of the pivots of said housing being substantially perpendicular to the plane of the strip passing through said pinch rolls and approximately midway of the length of the rolls.

2. In a continuous strip processing line in which the strip passes through processing equipment, the improvement comprising a pair of pinch roll units one on each side of the processing equipment, each of said pinch rolls units comprising a stationary support, a roll housing pivotally mounted on said stationary support, a pair of spaced apart bearings mounted in said housing on each side of the path of travel of said strip, a pair of automatically centering pinch rolls mounted in said bearings through which the strip passes, the axes of the pivots of said housing being substantially perpendicular to the plane of the strip passing through said pinch rolls and approximately midway of the length of the rolls, and a pair of stops mounted on said support and adapted to engage oppostie ends of the housing to limit the amount of movement thereof.

3. A pinch roll unit for conveying strip longitudinally therethrough comprising a stationary support, a roll housing pivotally mounted on said stationary support, a pair of spaced apart bearings mounted in said housing on each side of the path of travel of said strip, and a pair of automatically centering pinch rolls mounted in said bearings through which the strip passes, the axes of the pivots of said housing being substantially perpendicular to the plane of the strip passing through said pinch rolls and approximately midway of the length of the rolls.

4. A pinch roll unit for conveying strip longitudinally therethrough comprising a stationary support, a roll housing pivotally mounted on said stationary support, a pair of spaced apart bearings mounted in said housing on each side of the path of travel of said strip, a pair of automatically centering pinch rolls mounted in said bearings through which the strip passes, the axes of the pivots of said housing being substantially perpendicular to the plane of the strip passing through said pinch rolls and approximately midway of the length of the rolls, and a pair of stops mounted on said support and adapted to engage opposite ends of the housing to limit the amount of movement thereof.

EDWIN T. LORIG.

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