

June 3, 1958

D. E. FEICK

2,837,331

APPARATUS FOR GUIDING STRIP INTO PIN-HOLE DETECTOR

Filed Aug. 18, 1954

FIG. 1.

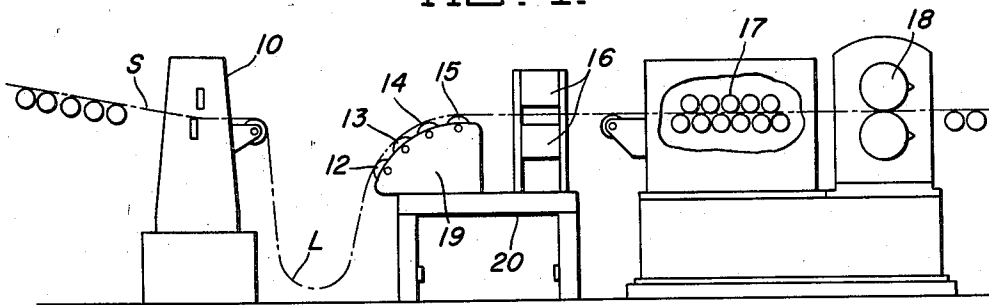
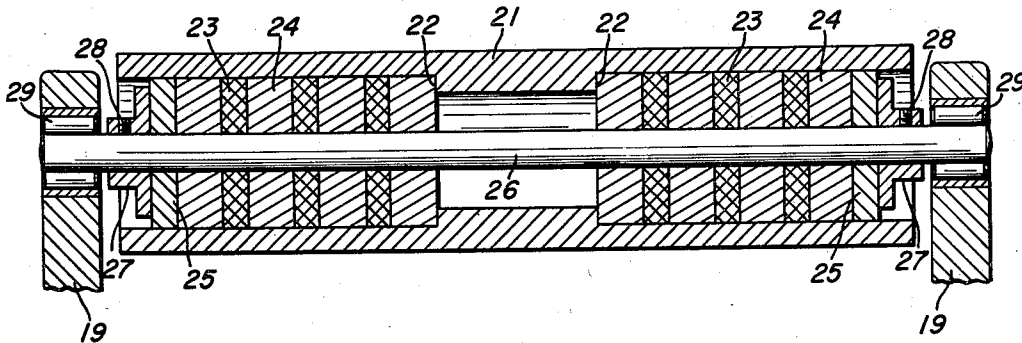


FIG. 2.



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APPARATUS FOR GUIDING STRIP INTO PIN-HOLE DETECTOR

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1 Claim. (Cl. 271—2.6)

This invention relates to improvements in directional rollers at the exit end of an electrolytic tinning line.

Electrolytic tinning lines apply a tin coating to steel while the latter is in continuous strip form. Near the exit end of the line the coated strip usually travels through a light sensitive pin-hole detector and a flying shear, which cuts it into individual sheets. Sheets which contain imperfections are diverted by a deflector whose operation is initiated by the pin-hole detector. Immediately preceding the pin-hole detector the strip commonly is allowed to sag in a relatively short loop. A directional roller is located under the strip to support and guide it from this loop into the pin-hole detector. In previous lines with which I am familiar, the only means for stopping sideways in the strip in this region has been the rigid guides for the strip edges in the pin-hole detector. As a consequence, excess sway can damage strip edges, as well as allow light leakage which causes subsequent diversion of sheets actually free of pin-holes.

An object of my invention is to provide improved directional rollers which stop sideways of the strip.

A more specific object is to provide improved directional rollers which hold the strip by magnetic attraction and thus stop sideways.

In accomplishing these and other objects of the invention, I have provided improved details of structure, a preferred form of which is shown in the accompanying drawing, in which:

Figure 1 is a schematic side elevational view of the exit end portion of an electrolytic tinning line equipped with directional rollers constructed in accordance with my invention and

Figure 2 is a vertical section through a preferred form of magnetic directional roll used in the line shown in Figure 1.

Figure 1 shows the exit portion of an electrolytic tinning line, that is, the portion which follows the tinning equipment and the pull-through or tension bridle. The portion shown includes an up-cut shear 10, a series of directional rollers 12, 13, 14 and 15, a pin-hole detector 16, a roller leveler 17, and a flying shear 18. A coated steel strip S travels from left to right through the up-cut shear, over the directional rollers, and through the pin-hole detector, roller leveler and flying shear. Normally the up-cut shear is idle, and the flying shear severs the strip into sheets. Between the up-cut shear and the directional rollers, the strip sags in a short loop L. Apart from the directional rollers, the foregoing mechanisms can be of any standard or desired construction and hence are not shown nor described in greater detail. For a more complete showing of an electrolytic tinning line, reference can be made to "The Making, Shaping and Treating of Steel" published by United States Steel Corporation, sixth edition, pages 978 to 987.

In accordance with my invention, a series of directional rollers 12, 13, 14 and 15 of relatively small di-

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ameter are employed in lieu of the conventional single larger roller at this location. These rollers are journaled for free rotation on parallel horizontal axes in bearing plates or fixed supports 19 illustrated as supported on a stand 20, which also supports the pin-hole detector 16. The centers of the directional rollers lie on an arc which is concave downwardly. The upper surface of the roller 15 at the exit end of the series is approximately in the same plane as the strip guides of the pin-hole detector 16. The roller 15 is magnetic. Although other rollers of the series could also be made magnetic if desired, I find that non-magnetic rollers operate satisfactorily. The magnetic roller 15 attracts the strip and this stops any sideways before the strip enters the pin-hole detector 16.

The magnetic roller 15 can be of any desired construction, embodying either permanent magnets or electromagnets. Since permanent magnets are satisfactory, I prefer them in the interest of simplicity. Figure 2 illustrates a magnetic roller construction found successful in actual use. The roller includes a hollow cylindrical shell 21 of non-magnetic material such as brass. Intermediate its length the bore of the shell has a section of reduced internal diameter forming a pair of opposed internal shoulders 22. Two groups of annular permanent magnets 23 and spacers 24 arranged alternatively are mounted within the end portions of the shell bore and abut the shoulders 22. End pieces 25 are mounted within the shell at each outer end of the groups of magnets and spacers. The resulting assembly is mounted on a shaft 26 and is held thereon by collars 27 and set screws 28. The shaft is journaled at its opposite ends in antifriction bearings 29 mounted in the plates 19.

From the foregoing description it is seen that my invention affords the effective means of stopping sideways in strip through a simple improvement in the directional rollers. Only a relatively small magnetic attraction is necessary to stop such sway before the strip enters the pin-hole detector where it is objectionable. The series of directional rollers provide a more positive support for the strip than the usual single roller.

While I have shown and described only a single embodiment of the invention, it is apparent that modifications may arise. Therefore, I do not wish to be limited to the disclosure set forth but only by the scope of the appended claim.

I claim:

In the exit end portion of an electrolytic tinning line, wherein a coated steel strip forms a short loop which is guided into a pin-hole detector, a pin-hole detector, and means for supporting and guiding the strip between the exit end of the loop and the pin-hole detector, said means comprising a pair of fixed supports at opposite sides of the strip path, a series of directional rollers journaled in said supports for free rotation on parallel horizontal axes, said axes lying in an arc which is concave downwardly, the upper face of the roller at the exit end of the series lying in approximately the plane of the strip path through the pin-hole detector, and magnets mounted within the roller at the exit end to render it magnetic.

References Cited in the file of this patent

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1,482,354	Dausmann	Jan. 29, 1924
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U. S. DEPARTMENT OF COMMERCE

PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 2,837,331

Daniel E. Feick

June 3, 1958

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 1, line 21, for "shets" read -- sheets --; line 70, for "rolelrs" read -- rollers --; column 2, line 14, for "this" read -- thus --; line 26, for "alternatively" read -- alternately --; line 35, for "the" read -- an --.

Signed and sealed this 5th day of August 1958.

(SEAL)

Attest:

KARL H. AXLINE

Attesting Officer

ROBERT C. WATSON
Commissioner of Patents