Aug. 26, 1958 E. A. PAULS ET AL 2,849,193

APPARATUS FOR SLITTING ALUMINUM WEBS AND REWINDING STRIPS THEREFROM

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FIG. 1.

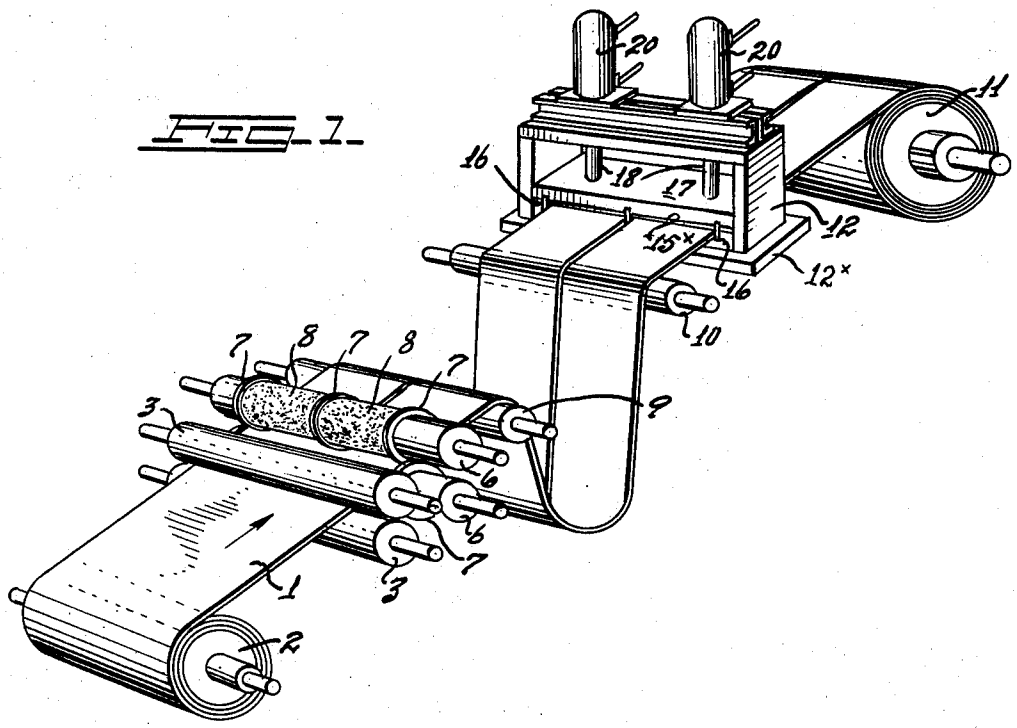
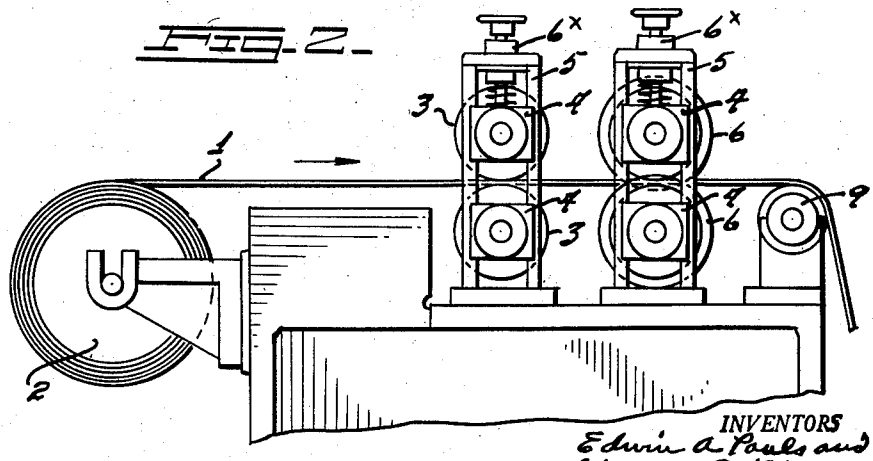


FIG. 2.



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FIG. 3

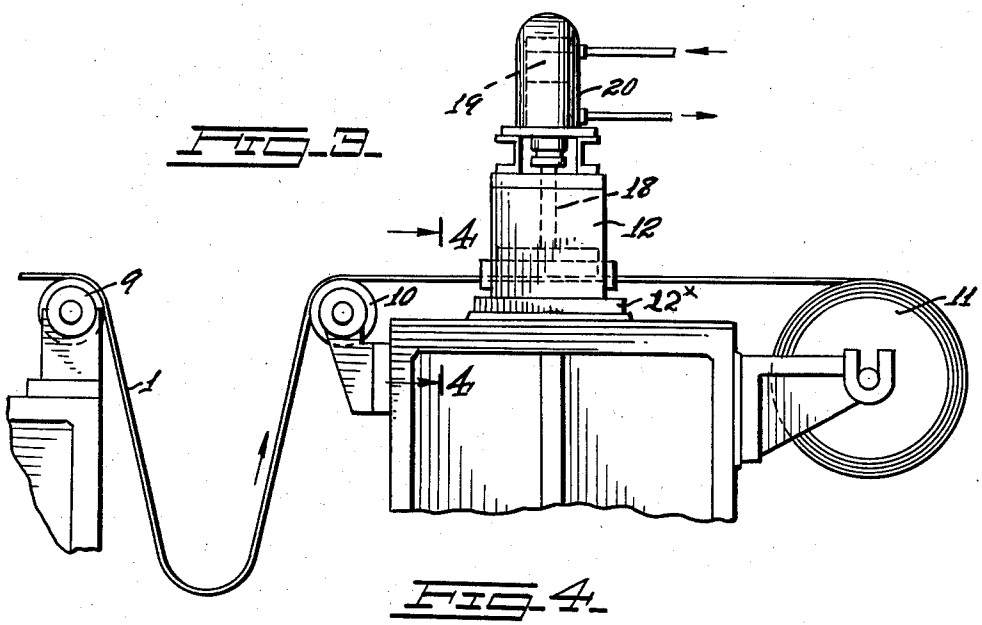


FIG. 4

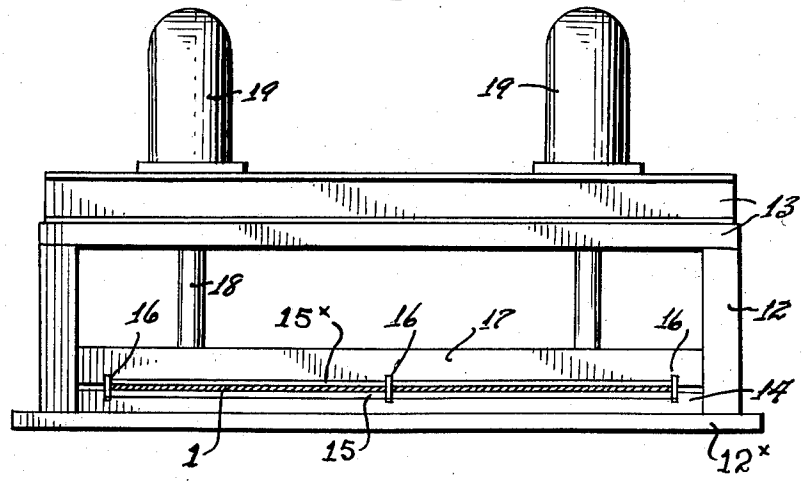
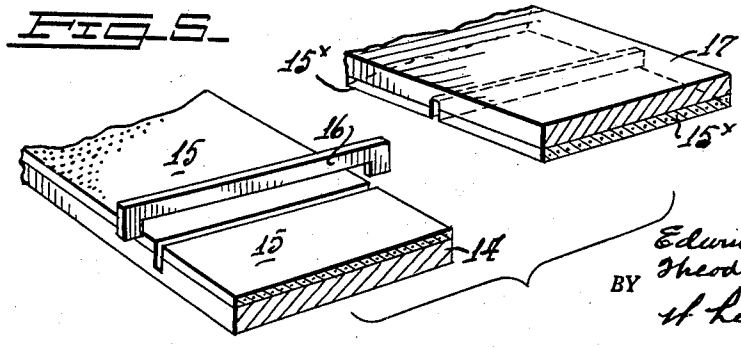


FIG. 5



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APPARATUS FOR SLITTING ALUMINUM WEBS AND REWINDING STRIPS THEREFROM

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Application January 26, 1956, Serial No. 561,396

1 Claim. (Cl. 242—78.1)

This invention relates to an apparatus and method of slitting and continuously re-winding slit strips of metal on a smooth surfaced rewind reel, and in such manner that spacer disks on the reel are eliminated.

Conventional slitting involves the use on the rewind reel of large steel diameter discs, usually 1/16" thick, for separating the strips on the reel as they are wound. These discs necessarily impede removal of the cut strips from the reel, and also have far greater disadvantages. Actual strip breakage is incurred with light gauges. The steel disc separators also involve a problem in their tendency to abrade or actually deform the strip edges by excessive friction guiding. Tension is applied to the composite number of strips uniformly. If the gauge or edge build up of one or more cut strips of the group varies, it or they will build up on the reel to a larger diameter than the related strips, and as the entire make-up of coils is driven on the one reel, the larger diameters tend to overrun in strip speed and consequently take all the tension. This results in some slit coils being loosely wound, some being tightly wound, and soft and hard segments within the coils due to the over diameter build up of one or more of the strips.

It is an object of this invention to eliminate steel disc separators on the rewind reel, and provide means which will enable production of cut strips free from burrs, edge fringe or knife slippage.

It is a further object of this invention to feed the cut strips by special resilient spacers on the slitter rolls, and to interpose a squeeze brake between a free loop from the slitters and the rewind mandrel, which provides a method of absorbing torsional twist and effecting continuously a proper alignment of the slit strips upon the rewind reel, as well as supplying proper uniform tension to each web.

The invention will now be described with reference to the accompanying drawings in which:

Fig. 1 is a schematic view showing a simplified form of my apparatus, with an aluminum web slit in advance of a press box, the cut strips being positioned on a rewind reel in spaced relationship.

Fig. 2 is a fragmentary side elevation of the slitter and feed elements and the mountings therefor, showing the manner of mounting the pinch and slitter rolls.

Fig. 3 is a continuation of Fig. 2, showing in fragmentary side elevation the press-box and rewind reel of the apparatus.

Fig. 4 is a front elevation of the press-box, shown in Fig. 3.

Fig. 5 is a composite perspective view, schematically and fragmentarily showing the press-plates, cushions, and one of the separators, of the press-box.

Referring to the drawing, a wide web of aluminum in coil form, and indicated at 1, is mounted on a pay-off reel 2, and is passed between pinch rolls 3 the shafts of which are in bearing blocks 4, Fig. 2, mounted to slide vertically in opposed guides 5. Adjustable press-down

screws 6X may be employed to impose light pressure on the bearing block. The metal web then passes to a pair of slitter rolls 6, which are mounted in the same manner as the pinch rolls, and which are provided with knives 7. These knives will be in pairs, each pair consisting of coacting upper and lower knives, and the number of the pairs will be in accordance with the number of strips to be cut from the web and the size of the press-box and other elements. In the present embodiment we have shown, for simplicity only apparatus for cutting two strips from a web, although we have successfully cut and reeled with adequate separation, 48 strips, each one inch wide, from a web correspondingly wide.

One of the features of our invention is that means are provided for avoiding any slip of the web at the points of cut. This is done by employing the slitter rolls as feed elements for the web and the strips. To such end, and as shown in Fig. 1, the top slitter rolls 6 is provided with a resilient feed "reel" 8 for each cut-strip, and there will be a like feed reel on the lower slitter roll 6 to coact with the upper feed reel, for each strip. These feed reels 8 are rubber covered spacers preferably covering the full distance between knives, and are approximately of the same outer diameter as the knives. Thus if the cutters are in number adapted to cut 45 strips from an aluminum web, there will be provided on the slitter rolls 45 pairs of resilient feed rolls.

The strips or bands cut from the web 1 are pushed by the feed reels over a loop forming roll 9 and into a downwardly extending loop at the top of which is a second supporting and loop forming roll 10. From roll 10 the feed to the take-up reel 11 is by tension and pull of the reel, and for such purpose reel 11 will be powered by a means not shown.

In advance of take-up reel 11 is the press-box 12, the latter having a base 12x, top members 13, and side uprights which support the top members.

Supported on the base member of the press-box is a bottom pressure plate 14 provided at its top with one or a plurality of cushions 15 of any suitable material. The plate 14 is provided with outermost strip guides 16, and that number of intermediate guides which are necessary to space the cut strips apart for a predetermined spacing, in order that they may reach and be wound upon the take-up reel 11 with exactly the same degree of spacing.

At 17, Figs. 5 and 1, is shown the upper press platen which will be below, and ordinarily carried by piston-rod 18 leading to pistons 19 within cylinders 20. The press-platen 17 is channelled to receive the guidespacer 16, and its lowest face will carry cushioning material 15x.

It will be understood that by applying fluid pressure above the pistons in the cylinders 20, as for example air, a desired pressure, yielding because of the cushioning material on the plates 14 and 17, will be obtained, which pressure will be considerably less than the tension imposed upon the cut strips by the pull of the take-up reel. At the same time, assured aligning and positioning of the strips on the take-up reel is assured.

Because of the loop in the cut strips between rollers 9 and 10, sufficient lateral movement, without distortion, is permitted between the strips so that they will be accurately and positively spaced by the elements 16, and the exterior strips will be brought into edge-guiding abutment with the outermost elements 16.

It will be understood that the feed-cutter rolls will be positively driven at speeds to maintain a loop in advance of the press-box, and that by means well known in the art the speed will be somewhat increased when convolutions of the cut strips increase the diameter of the take-up reel plus the convolutions of strip thereon.

It will also be understood that various modifications

in the form and arrangement of the elements constituting the embodiment illustrated in the drawings may be made without departing from the spirit of the invention.

Having described my invention, what I claim and desire to secure by Letters Patent, is as follows:

In apparatus for slitting metallic webs and rewinding strips therefrom, improved rewinding means comprising means for guiding and supporting the slit web into a slack loop formation, a take-up reel, and means forwardly of the take-up reel for imparting vertical pressure to the cut strips of the web and for separating the cut strips, the pull upon the cut strips, intermediate the loop formation thereof and said pressure means being by the take-up reel, the said pressure and strip separating means consisting of a cushioned base plate, a cushioned upper plate, each transversely channeled, and separator strips in the channel of one plate and adapted to enter the channel of the second plate when the plates are brought into engagement with the cut strips.

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