Jan. 29, 1957 E. R. MUDDIMAN 2,779,550

APPARATUS FOR HANDLING STRIP

Filed May 6, 1955 2 Sheets-Sheet 1

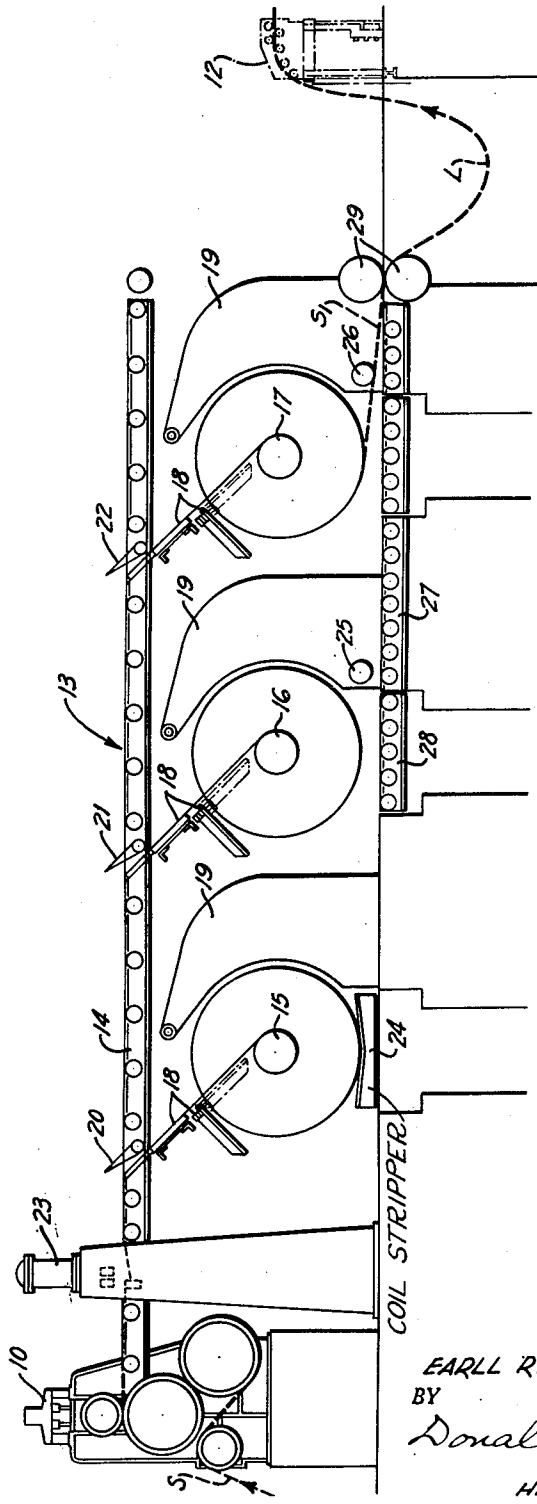


Fig. 1

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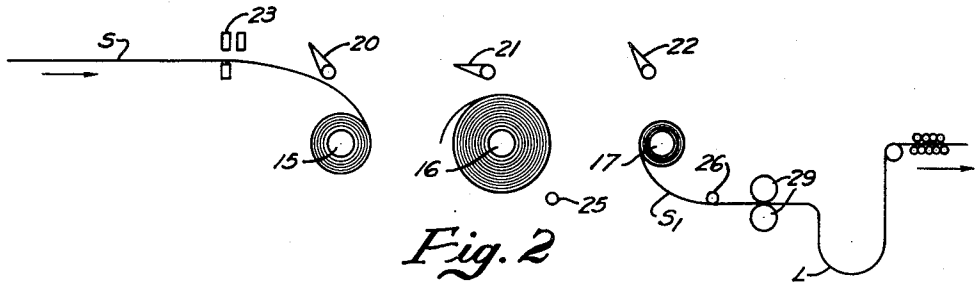


Fig. 2

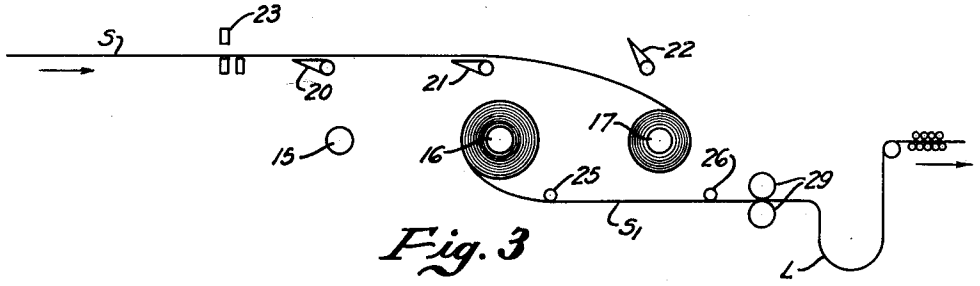


Fig. 3

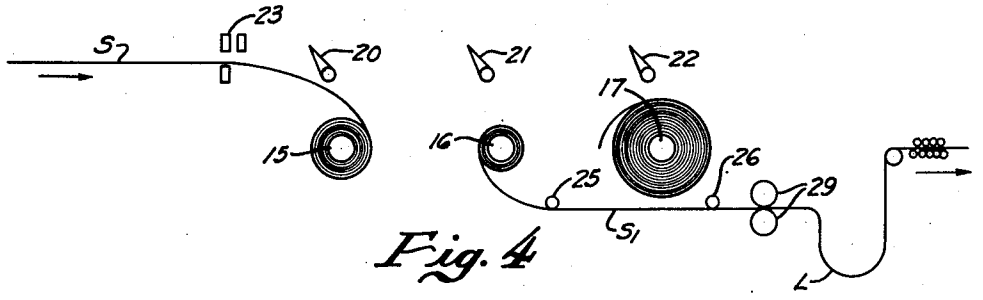


Fig. 4

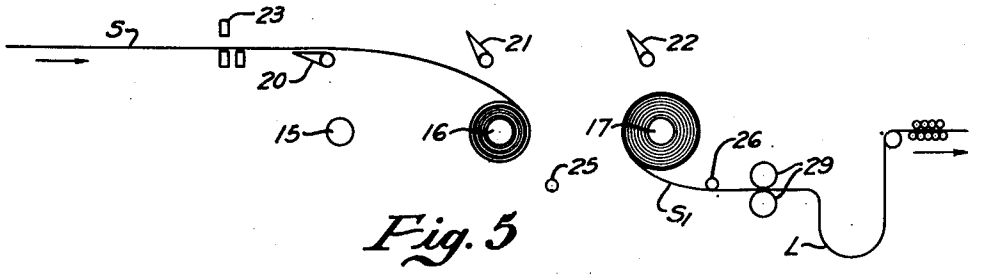


Fig. 5

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APPARATUS FOR HANDLING STRIP

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Application May 6, 1955, Serial No. 506,537

5 Claims. (Cl. 242—80)

This invention relates to an improved apparatus for handling strip material which emerges from a high speed processing line and feeds into a succeeding lower speed line.

An object of the invention is to provide an improved handling apparatus which both coils the full output of strip from a high speed line and also supports coiled strip for uncoiling and feeding into a low speed line up to the capacity of the latter.

A further object is to provide an improved handling apparatus which includes a series of mandrels or the like adapted either to coil strip emerging from a high speed line or to support coiled strip for uncoiling and feeding into a low speed line, along with a mandrel or the like for coiling excess strip beyond the capacity of the low speed line.

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 drawings, in which:

Figure 1 is a somewhat diagrammatic side elevational view of a handling apparatus constructed in accordance with my invention;

Figure 2 is a schematic view of the apparatus with one mandrel coiling strip from the high speed line, a second mandrel idly supporting a coil in reserve, and a third mandrel supporting a coil feeding to the low speed line;

Figure 3 is a schematic view with the first mandrel idle and having the coil removed, the second feeding to the low speed line, and the third coiling from the high speed line;

Figure 4 is a schematic view with the first mandrel coiling strip from the high speed line, the second feeding strip to the low speed line, and the third idly supporting a coil in reserve; and

Figure 5 is a schematic view with the first mandrel idle, the second coiling from the high speed line, and the third feeding to the low speed line.

Figure 1 shows somewhat diagrammatically the exit end portion **10** of a high speed strip processing line, the entry end portion **12** of a lower speed line aligned therewith, and a handling apparatus **13** constructed in accordance with my invention situated therebetween. By way of example, the respective lines can be an electrolytic tinning line for steel strip, which operates at a strip speed of about 1000 feet per minute, and a shear line, which operates efficiently at a strip speed of only about 500 feet per minute.

My handling apparatus comprises a horizontal idler roller conveyor **14** adapted to support strip S as it emerges from the high speed line. A plurality of longitudinally spaced parallel power driven mandrels **15**, **16**, and **17** are journaled beneath said conveyor. Per se the mandrels can be of any standard or desired construction, and are shown equipped with conventional entry guide aprons **18** and belt wrappers **19**. The apparatus includes three deflectors **20**, **21**, and **22** pivoted in the plane of the conveyor above the respective mandrels **15**, **16**, and **17**. A

conventional crop shear **23** straddles the conveyor adjacent its entry end preceding the first mandrel **15** and deflector **20**. A conventional elevating type coil stripper **24** is located beneath the first mandrel **15**. Hold-down rolls **25** and **26** are journaled below and on the exit side of the second and third mandrels **16** and **17** respectively. A removable horizontal idler roller conveyor **27** is located beneath the latter mandrels and the hold-down rolls. Preferably this latter conveyor has a separately removable section **28** under the second mandrel **16**. Strippers or feeding carriages similar to **24** can be installed under either or both the second and third mandrels **16** and **17** in place of the conveyor **27** when desired. A pair of power driven pinch rolls **29** are journaled adjacent the exit end of the conveyor **27**.

In operation, a continuous strip S emerges from the high speed line **10** and is supported on the conveyor **14**. The strip can pass selectively beneath any one of the deflectors **20**, **21**, or **22** to the corresponding mandrel **15**, **16**, or **17**, which acts as a coiler therefor. The particular deflector under which the strip travels is of course raised, while any deflectors over which it travels are lowered. Either the second or third mandrel **16** or **17** selectively can be used simultaneously as an uncoiler for feeding coiled strip S_1 to the low speed line **12**. The latter strip passes under the hold-down roll **25** or **26**, over the conveyor **27** and is motivated by the pinch rolls **29**. Commonly it hangs in a short loop L between the handling apparatus and the line **12**. Whenever a coil is completely wound on one of the mandrels, the crop shear **23** is operated to sever the strip so that a new coil can be started on another mandrel. A completed coil can remain idly on either mandrel **16** or **17** in reserve for subsequent uncoiling and feeding to the line **12**. The stripper **24** is operated to remove completed coils from the mandrel **15**, since such coils are in excess of the capacity of the line **12**.

Figures 2 to 5 illustrate successive steps in my handling method. In Figure 2 coils previously have been wound on the second and third mandrels **16** and **17**, while strip S from the line **10** currently is coiling on the first mandrel **15**. The second mandrel **16** is holding its coil in reserve, while the third mandrel **17** is functioning as an uncoiler and feeding strip S_1 into the line **12**. Figure 3 shows the next step in which strip S from the line **10** is coiling on the third mandrel **17**, the previous coil thereon having been fully processed in the low speed line. The second mandrel **16** is functioning as an uncoiler and feeding strip S_1 to the line **12**. The coil on the first mandrel **15** has been completed and removed for further processing elsewhere. Figure 4 shows the next step in which strip S from the line **10** again is coiling on the first mandrel **15**. The third mandrel **17** is holding its coil in reserve, while the second mandrel still functions as an uncoiler as in Figure 3. Figure 5 shows the remaining step in which strip from the line **10** is coiling on the second mandrel **16**. The third mandrel **17** again is functioning as an uncoiler, while the coil on the first mandrel has been removed.

The apparatus is highly flexible in its operation. In the event the two lines are operating at the same speed, and continuous operation is desired, the strip can pass over the upper conveyor **14** directly into the second line without being coiled. In the event it is not desired to operate the second line, the conveyor section **28** can be removed and a stripper similar to **24** substituted. Coils then can be wound alternately on the first two mandrels **15** and **16** and removed when finished. In the event it is not desired to operate the first line, conveyor **27** and its section **28** can be removed and two feeding carriages substituted. Coils can be fed alternately from the mandrels **16** and **17** to the second line. With this last set up

the two lines also can be operated independently. While the example refers to a line speed ratio of two to one, other ratios are readily accommodated through proper adjustment in the size of coil wound on the various mandrels. For higher ratios appropriately smaller coils are wound on the second and third mandrels 16 and 17, while for lower ratios appropriately smaller coils are wound on the first mandrel 15.

While I have shown and described only a single embodiment of my 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 claims.

I claim:

1. The combination, with a high speed strip processing line and a succeeding low speed strip processing line aligned therewith, of a handling apparatus situated between said lines and comprising a conveyor and at least three spaced parallel power driven mandrels journaled beneath said conveyor, any selected one of said mandrels being adapted to have strip from said high speed line coiled thereon, either of at least two of said mandrels being selectively adapted to serve simultaneously as an uncoiler for feeding strip to said low speed line.

2. The combination with a high speed strip processing line and a succeeding low speed strip processing line aligned therewith, of a handling apparatus situated between said lines comprising a roller conveyor, at least three spaced parallel power driven mandrels journaled beneath said conveyor, any selected one of said mandrels being adapted to have strip from said high speed line coiled thereon, either of at least two of said mandrels being selectively adapted to serve simultaneously as an uncoiler for feeding strip to said low speed line, and means beneath said latter two mandrels for guiding the strip to said low speed line.

3. The combination, with a high speed strip processing line and a succeeding low speed strip processing line aligned therewith, of a handling apparatus situated between said lines and comprising a roller conveyor, a crop shear adjacent the entry end of said conveyor, at least three spaced parallel power driven mandrels journaled beneath said conveyor following said shear, any selected one of said mandrels being adapted to have strip from said high speed line coiled thereon, either of the last two of said mandrels being selectively adapted to serve simultaneously as an uncoiler for feeding strip to said low speed line, hold-down rolls below and on the exit side of said last two mandrels respectively, and a roller conveyor beneath said hold-down rolls.

4. The combination, with a high speed strip processing line and a succeeding low speed strip processing line aligned therewith, of a handling apparatus situated between said lines and comprising a roller conveyor, a crop shear adjacent the entry end of said conveyor, three spaced parallel power driven mandrels journaled beneath said conveyor following said shear, any selected one of said mandrels being adapted to have strip from said high speed line coiled thereon, either of the last two of said mandrels being selectively adapted to serve simultaneously as an uncoiler for feeding strip to said low speed line, a coil stripper below the first of said mandrels, hold-down rolls below and on the exit side of said last two mandrels respectively, and a removable roller conveyor beneath said hold-down rolls and said last two mandrels.

5. A combination as defined in claim 4 in which said last named conveyor has a separately removable section located under the second mandrel.

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