Feb. 5, 1946. E. R. MUDDIMAN 2,394,466

METAL STRIP PROCESSING APPARATUS

Filed Oct. 1, 1943

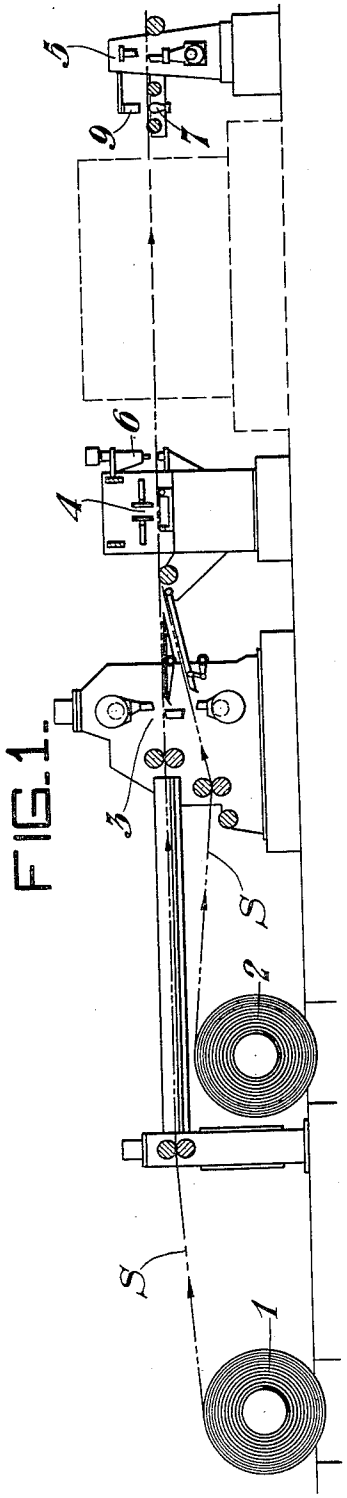


FIG. 1.

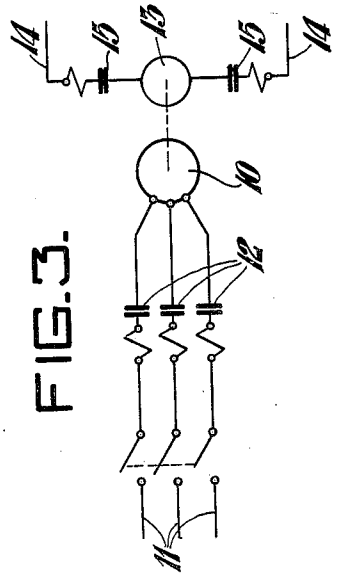


FIG. 3.

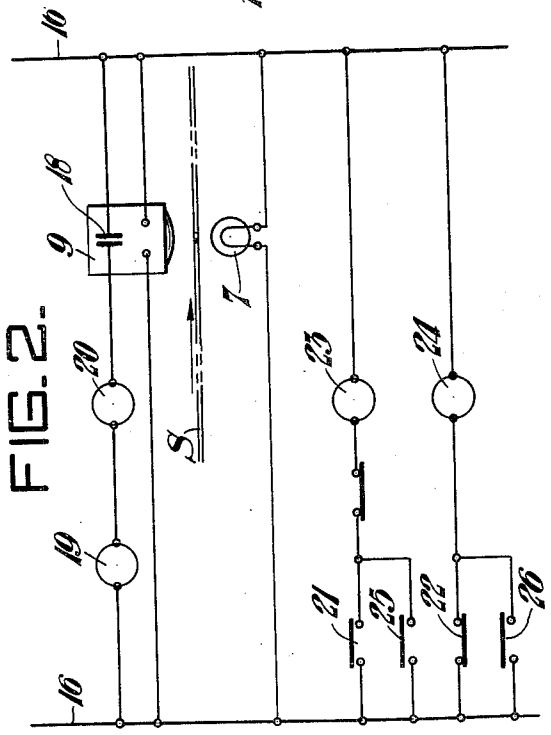


FIG. 2.

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METAL STRIP PROCESSING APPARATUS

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1 Claim. (Cl. 29—33)

This invention is concerned with the problem of joining metal strip lengths, so that they may be processed as a continuous strip, and thereafter shearing the joined lengths so as to remove the joints.

A specific example of the invention is illustrated by the accompanying drawing, in which:

Figure 1 is a side view of the machine; and

Figures 2 and 3 are wiring diagrams.

More specifically speaking, the drawing shows uncoilers 1 and 2 feeding strip lengths S to a shear 3 which squares the ends of the lengths so that, upon leaving the shear, they may be successively welded end-to-end by a welder 4, whereby the various strip lengths can be fed continuously like a single strip during processing. The welded joints must be eventually cut from the lengths since these joints represent scrap. Other types of joints present a similar situation. Therefore, the joined lengths eventually feed, after processing, to a shear 5. Prior to this invention this shear 5 had to be manually operated so as to shear the lengths once in front of each joint and once behind each joint, to remove the joint.

According to this invention a punch 6 is located at the welder 4 and functions, either automatically in cooperation with welding operations or manually, to punch a hole in the lengths in front of each joint made by the welder. Thusly, the lengths are marked. Upon reaching the flying shear 5 the punched holes, forming the marks, register with a light beam from a light source 7 directed to a photoelectric cell 9, the lengths normally interrupting this light beam excepting upon registration of the punched holes so as to permit its passage.

Referring now to the wiring diagrams, the flying shear 5 is worked by an electric motor 10 powered by power lines 11 through relay contacts 12. This motor 10 is provided with the usual brake solenoid 13 powered by power lines 14 through relay contacts 15, the brake being of the ordinary type biased to braking position and adapted to release upon energization by closing of the contacts 15.

Control circuit power lines 16 power the light source 7 and a conventional amplifier and relay arrangement for the photoelectric cell 9, the arrangement being such that contacts 18 are closed when the photoelectric cell receives light from the light source 7, which occurs, of course, upon registration of the punched holes with the light beam from the light source 7. When this occurs, the contacts 18 close so as to energize two time delay relay solenoids 19 and 20, the time delay relay, having the solenoid 19, being arranged to close its contacts 21 and 22 at that time. Upon the closing of the contacts 21 and 22 the solenoid 23 of the relay having the contacts 12 is energized so that the motor 10 starts and the shear 5 operates to shear the strip once, the contacts 22 energizing the relay solenoid 24 of the relay having the contacts 15, whereby the solenoid 13 of the motor brake is energized so as to release this brake. After an interval of time the contacts 21 and 22 open so as to deenergize the solenoids 23 and 24 so as to cause stoppage of the motor 10 and application of its brake by the deenergizing of the brake solenoid 13. The time delay of the relay having the solenoids 19 and contacts 21 and 22 is such that the shear operates to make a single cut, this cut being, of course, in advance of the welded joint joining the strip lengths.

The strip lengths continue to feed through the shear 5, and the time delay relay having the solenoid 20 is set so that as the back of the joint just clears shearing position respecting the shear 5, the contacts 25 and 26 of this relay close so as to reenergize the solenoids 23 and 24, causing operation of the shear 5 as previously explained, and, after a time interval sufficient to effect a single shearing action of the shear 5, these contacts 25 and 26 open so as to stop the shear 5.

It is apparent from the foregoing that as the strip lengths are joined and marked at the welder 4, processed, and eventually arrive at the shear 5, the joints are automatically cut from the strip lengths so that the portions of the latter marred by the joints are removed automatically therefrom.

I claim:

Apparatus comprising the combination of means for making joints between the ends of a plurality of metal strip lengths so they can be fed continuously like a single strip during processing, means for marking the strip lengths near the joints between their ends, a shear, means for eventually feeding the joined strip lengths through the shear, a power source for the shear, a unit associated with the shear for operation by passage of the marks on the strip lengths, and means operated by the unit for connecting the power source to the shear at spaced time intervals causing shearing of the strip lengths adjacent the beginnings and endings of the joints between their ends, the means for marking the strip lengths being a punch punching holes in the strip lengths, and the unit being a light source arranged to pass a light beam through the punched holes as they register with the beam in conjunction with a light responsive unit actuated by the beam passing through the punched holes.

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