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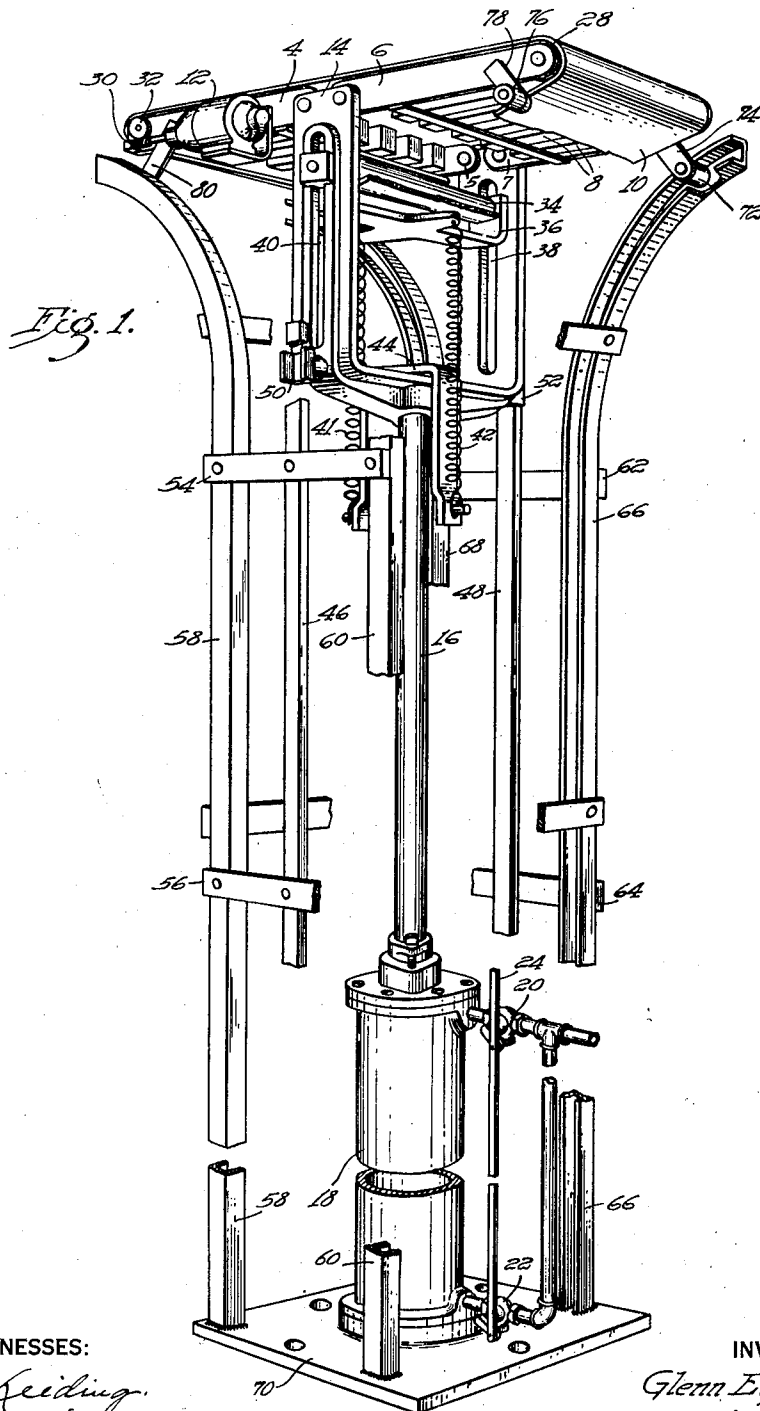
G. E. STOLTZ

2,331,246

THREADING DEVICE

Filed Feb. 21, 1942

2 Sheets-Sheet 1



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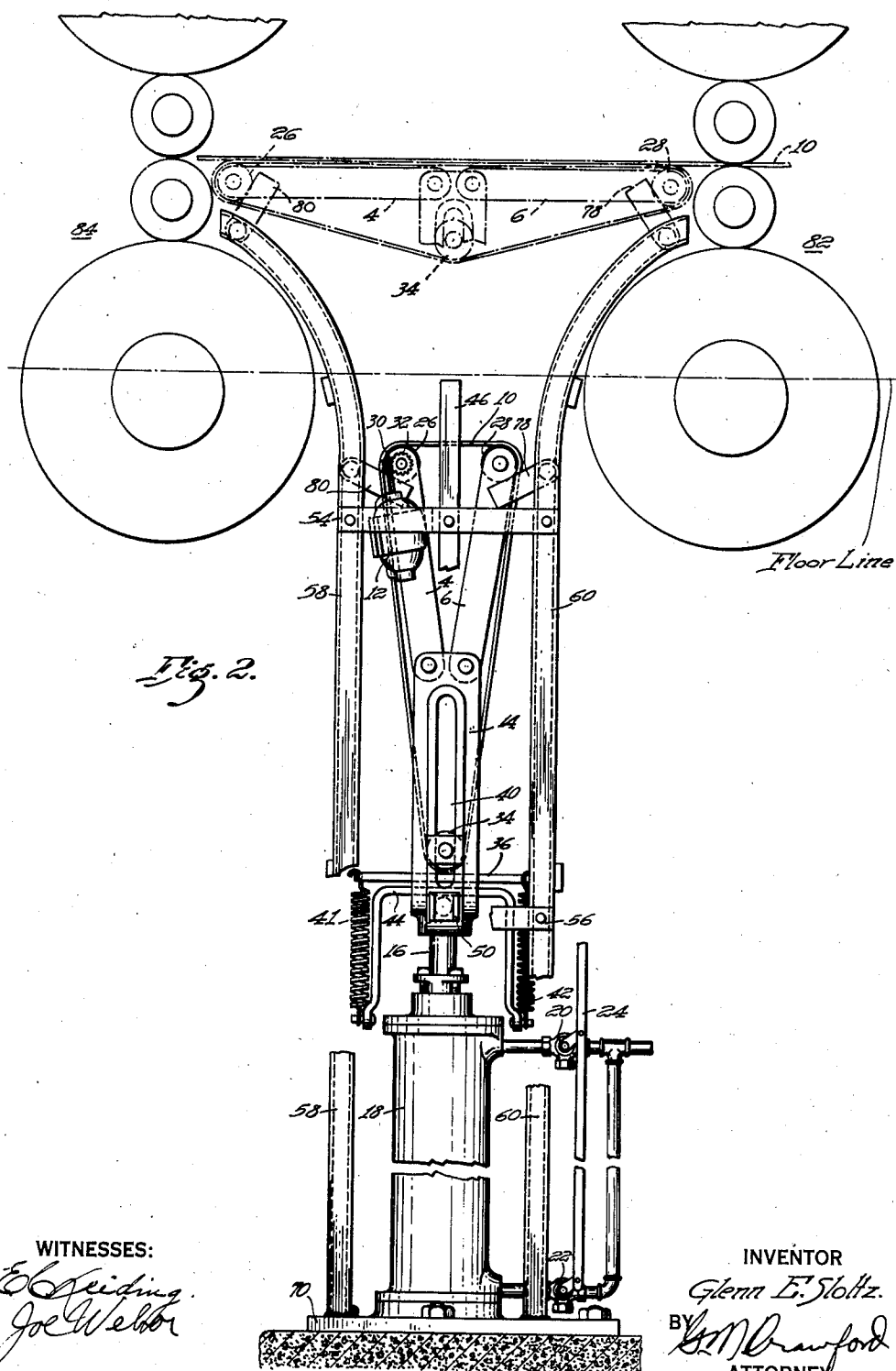
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UNITED STATES PATENT OFFICE

2,331,246

THREADING DEVICE

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7 Claims. (Cl. 80-44)

My invention relates, generally, to threading devices and, more particularly, to devices for threading magnetic material between work devices such as the adjacent roll stands of a steel strip rolling mill.

In the operation of steel strip rolling mills having a plurality of roll stands, considerable time and effort is expended in conveying and guiding the strip from each roll stand to the next adjacent roll stand. Heretofore, this operation has had to be performed manually by the operator who grasps the end of the strip as it emerges from each roll stand and guides it into the next roll stand.

An object of my invention, therefore, is to provide a threading device for magnetic strip material which shall function to thread the end of a length of the material into a work device automatically as it is delivered from another work device, which shall thereby increase the speed of functioning and the output of the work devices, and which shall be inexpensive to manufacture, install, operate and maintain.

These and other objects and advantages of the invention will be apparent from the following detailed description taken in connection with the accompanying drawings, in which:

Figure 1 is a perspective view of the preferred embodiment of my invention having certain parts of the device broken away to show the constructional features of the device, and

Fig. 2 is a side elevation view of the device in retracted position and in broken lines representing the normal operative position of the threading head with respect to the mill rolls.

In practicing my invention, I provide frame members 4, 5, 6 and 7 on which are mounted a plurality of magnets 8 and around which a belt or web member 10 is driven by a motor 12 which is mounted upon the frame member 4. The frame members 4, 5, 6 and 7 are hingedly mounted on a supporting U-shaped member 14 and may be actuated between the normal operating position shown in Fig. 1 and in broken lines in Fig. 2, and the retracted position shown in Fig. 2 by a piston rod 16 which is actuated by a piston in an air cylinder 18. Valve members 20 and 22 may be simultaneously actuated by an operating rod 24 to actuate the piston rod in the desired direction.

Considering the invention more in detail, roller members 26 and 28 extend between and are mounted for rotation upon the frame members 4 and 5 and 6 and 7, respectively. The roller member 26 is driven by the motor 12 through gear

members 30 and 32 to thereby cause the belt 10 to move around and across the upper surface of the frame members 4, 5, 6 and 7 and their associated magnets 8. An idling roller 34 is disposed to bear against the belt 10 and is mounted for rotation in a yoke member 36 which, in turn, is mounted for slidable movement along the arms of the U-shaped member 14 in slots 38 and 40 therein. Spring members 41 and 42 are secured to the yoke 36 and to a yoke member 44 which is suitably secured to the member 14 to thereby bias the idling roller 34 against the belt 10.

A pair of guide members 46 and 48 is disposed to engage cooperating guide members 50 and 52 on the U-shaped member 14 to thus insure straight line motion of the member 14 when actuated by the rod 16. The guide member 46 is secured to cross braces 54 and 56 which, in turn, are secured to upright channel members 58 and 60 and the guide member 48 is likewise secured to cross members 62 and 64 which, in turn, are secured to upright channel members 66 and 68. The channel members 58, 60, 66 and 68 are secured in any suitable manner to a base member 70 to which the cylinder 18 is also secured. The channel member 66 is curved at its upper end and serves as a guide for a roller 72 which is rotatably mounted upon an arm 74 which, in turn, is suitably secured to the frame member 7. A similar roller 76 and mounting arm 78 are secured to the frame member 6 and cooperate with a curved upper portion of the upright member 60 which has been cut away in the drawings for convenience of illustration of the other parts of the mechanism. A roller member similar to roller members 72 and 76 is also mounted upon a member 80 which, in turn, is secured to the frame member 4 to provide guiding relation between the frame member 4 and the upright member 58. Similar guide elements, not shown in the drawings, are provided to secure guiding relation between the frame member 5 and the upright channel member 68.

When the mechanism is in operative position and it is desired to retract it to the position shown in Fig. 2, the piston rod 16 may be moved downwardly and the rollers 72 and 76 associated with the frame members 7 and 6 and similar rollers associated with the frame members 4 and 5 will follow their guide channels 66, 60, 58 and 68, respectively. The frame members 4, 5, 6 and 7 will be made to fold about their pivotal mounting points on the arms of the U-shaped member 14 and will be drawn downward beneath the floor line in the position shown in Fig. 2.

In the operation of the device when it is desired to conduct the strip from a mill stand 82 to the next succeeding mill stand 84, the valve rod 24 may be operated to turn the valves 20 and 22 in such a position as to permit the air to exhaust from the upper portion of the cylinder 18 and to permit air pressure to be applied in the lower portion of the cylinder 18 to thereby cause the piston rod 16 to move the frame members 4, 5, 6 and 7 and their cooperating magnets 8 and the belt 10 to the position shown in Fig. 1, and shown in broken lines in Fig. 2. At the same time, the magnets 8 and the motor 12 may be energized to thereby move the belt across the upper surface of the magnets in the direction from the roll stand 82 toward the roll stand 84. The end of the strip emerging from the roll stand 82 will be attracted by the magnets and will thereby be held against the belt 10 as it moves toward the roll stand 84. As the end of the strip leaves the end of the magnets mounted between the frame members 4 and 5, it will no longer be attracted to the belt 10 and will extend between and be engaged by the reducing rolls of the roll stand 84.

After the strip has been thus threaded from the roll stand 82 to the roll stand 84, the magnets 8 and the motor 12 may be energized and the valve rod 24 may be moved to the position shown in Fig. 2 to so actuate the valves 20 and 22 as to permit the air in the lower portion of the cylinder 18 to exhaust and to cause air pressure to be applied to the upper end of the cylinder 18 to thus cause the piston rod 16 to pull the mechanism down into the position shown in Fig. 2 below the floor line and out of the way of operators engaged in the operation of the mill.

It is to be understood that it is not necessary that the mechanism be retracted after every threading operation. It is contemplated that the table may be left in operative position with the magnets deenergized after the threading operation and while the strip is running through the mill. It is also to be understood that the device may be used to attract the trailing end of the strip while it is passing between roll stands to thereby prevent whipping of the loose end of the strip.

Thus it will be seen that I have provided a threading device for strip material which shall function to thread the end of a length of a material into a work device automatically as it is delivered from another work device which shall thereby increase the speed of functioning and the output of the work devices, and which shall be inexpensive to manufacture, install, operate and maintain.

In compliance with the requirements of the patent statutes, I have shown and described herein a preferred embodiment of my invention. It is to be understood, however, that the invention is not limited to the precise construction shown and described but is capable of modification by one skilled in the art, the embodiment herein shown being merely illustrative of the principles of my invention.

I claim as my invention:

1. In a device for threading a length of magnetic material from one work device from which it is being delivered to another work device to which it is to be fed, a U-shaped support, a magnetized device having a surface of such dimensions as to extend substantially from the one work device to the other, said magnetized device being formed in two parts with the adjacent ends of

the parts hinged to the U-shaped support, an endless belt mounted for movement over the surface of said magnetized device from the one work device to the other, means for actuating the belt, and means for actuating the U-shaped support to an operating position with respect to the work devices such that the end of the length of magnetic material as it is delivered from the one work device will engage and adhere to the moving belt and will thus be moved by the belt to the other work device and to a retracted position where the magnetized device and belt are removed from the region of the pass line of the length of material as it moves from one work device to the other.

2. A device for threading a length of magnetic material from one work device from which it is being delivered to another work device to which it is being fed comprising, a collapsible table structure including a plurality of magnetized devices presenting a relatively flat surface of such dimensions as to extend substantially from the one work device to the other work device, an endless belt mounted on the table structure for movement over the magnetized device in a predetermined direction whereby the length of material will adhere to the belt and be moved from one device to another and means mounted on the table structure for driving the belt, a movable support for the table structure operable to retain said table structure in an extended operating position with respect to the pass line of the length of material between the work devices and to collapse said table structure and retract it to a non-operating position removed from the region of the pass line, and fluid-responsive actuating means for the movable support.

3. In a device for threading a length of magnetic material from one work device from which it is being delivered to another work device to which it is being fed, a magnetized device having a surface of such dimensions as to extend substantially from the one work device to the other work device, said device being hinged intermediate its ends, a belt member, means for driving said belt member, means for so mounting said belt member with respect to the magnetized device as to cause the belt member, when driven, to move adjacent the surface of the magnetized device in the direction from the one work device toward the other work device, whereby the length of material will adhere to and be moved by the belt from the one work device to the other, and means supporting the magnetized device intermediate its ends operable to actuate said belt and said magnetized device between an operative position with respect to the work devices and the length of material and a retracted position out of the area of the pass line of the material.

4. In a device for threading a steel strip from one roll stand of a strip rolling mill to the next adjacent roll stand, a magnetized device so disposed with respect to the strip as it is delivered from the one roll stand as to attract the strip, a movable belt disposed between the magnetized device and the strip, means for moving said belt between the one and the next adjacent roll stands, movable support means for said magnetized device and belt, said movable support means being operable to hold said magnetized device and belt in an operative position with respect to the roll stands and to actuate said magnetized device and belt to an inoperative retracted position removed from the region of the pass line of

the strip between the roll stands to thereby leave the space between the roll stands free while the threading function is not being performed by the threading device, and fluid pressure responsive means for actuating the movable support means.

5. In a threading device for threading a length of material from one work device from which it is being delivered to another work device to which it is being fed, a pair of members having substantially plane surfaces and disposed with one of the ends of each adjacent an end of the other, hinge means securing the members together at their adjacent ends, means mounting the ends which are opposite the hinged ends of the members each adjacent one of the work devices, a movable belt, means for causing the belt to move over the surface of the members in the direction from the one work device to the other, means for causing the length of material to adhere to the belt as it passes over the members, and means for causing the members to be folded about their hinged connection and to be retracted from the area of the pass line of the length of material as it passes between the work devices.

6. In a threading device for threading a length of magnetic material from one work device from which it is being delivered to another work device to which it is being fed, a pair of magnetized members having substantially plane surfaces and disposed with one of the ends of each adjacent an end of the other, hinge means securing the magnetized members together at their adjacent

ends, means mounting the ends which are opposite the hinged ends of the magnetic members each adjacent one of the work devices, a movable belt, means for causing the belt to move over the surface of the members in the direction from the one work device to the other, and means for causing the magnetized members to be folded about their hinged connection and withdrawn from the area of the pass line of the length of magnetic material as it passes between the work devices.

7. In a device for threading a steel strip from one roll stand of a strip rolling mill to the next succeeding adjacent roll stand, a pair of magnetized members having substantially plane surfaces and disposed with one of the ends of each adjacent an end of the other, hinge means securing the magnetized members together at their adjacent ends, means mounting the ends of the members which are opposite the hinged ends each adjacent one of the roll stands, a movable belt, means for moving the belt over the surface of the members in the direction from the one roll stand to the next succeeding roll stand so that the end of the steel strip, when it emerges from the one roll stand, will adhere to the belt and be guided to the next succeeding roll stand, and means for causing the magnetized members to be folded about their hinged connection and withdrawn from the area of the pass line of the steel strip between the roll stands.

GLENN E. STOLTZ.