March 8, 1955 L. F. STEPHAN 2,703,685

GRIPPER JAWS FOR EXPANSIBLE MANDREL STRIP COILING REEL

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FIG. 2.

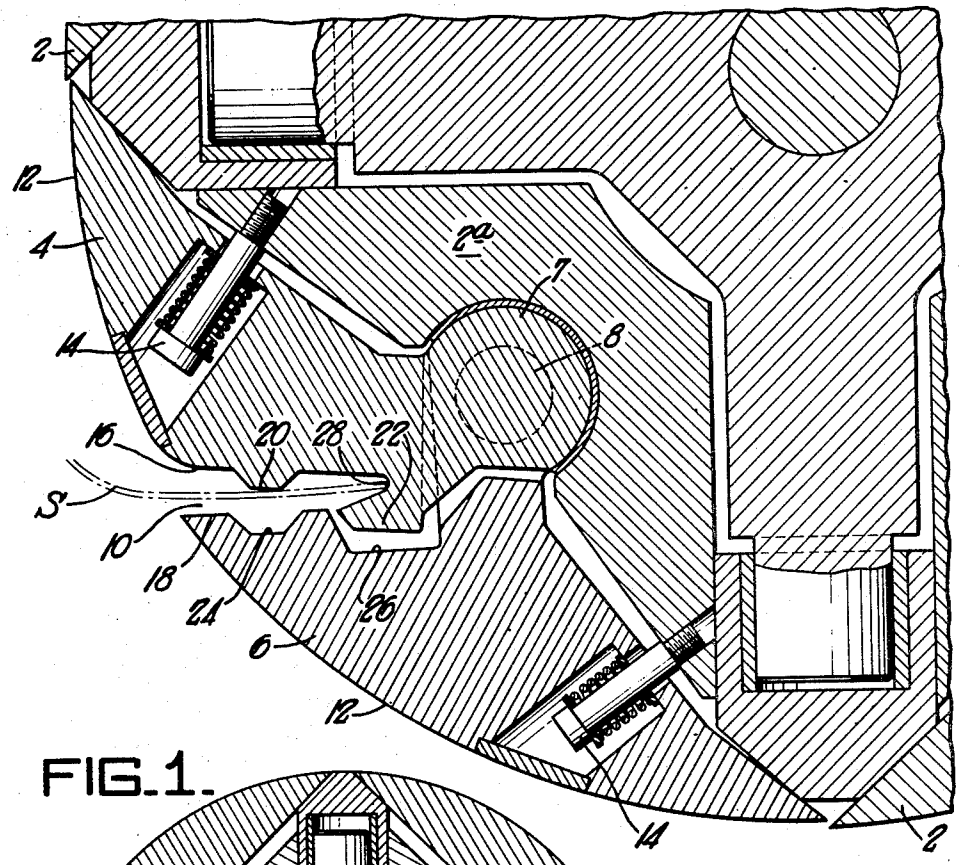
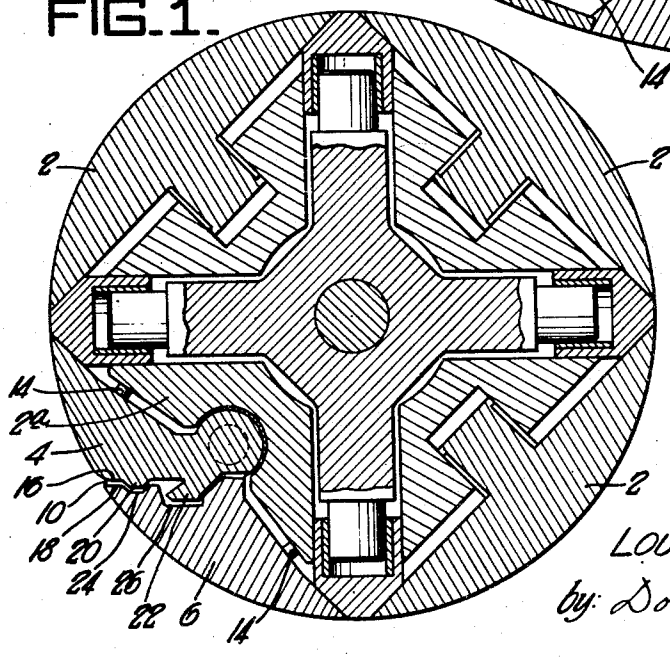


FIG. 1.



Inventor:
LOUIS F. STEPHAN,
by: Donald G. Dalton
his Attorney.

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FIG. 3.

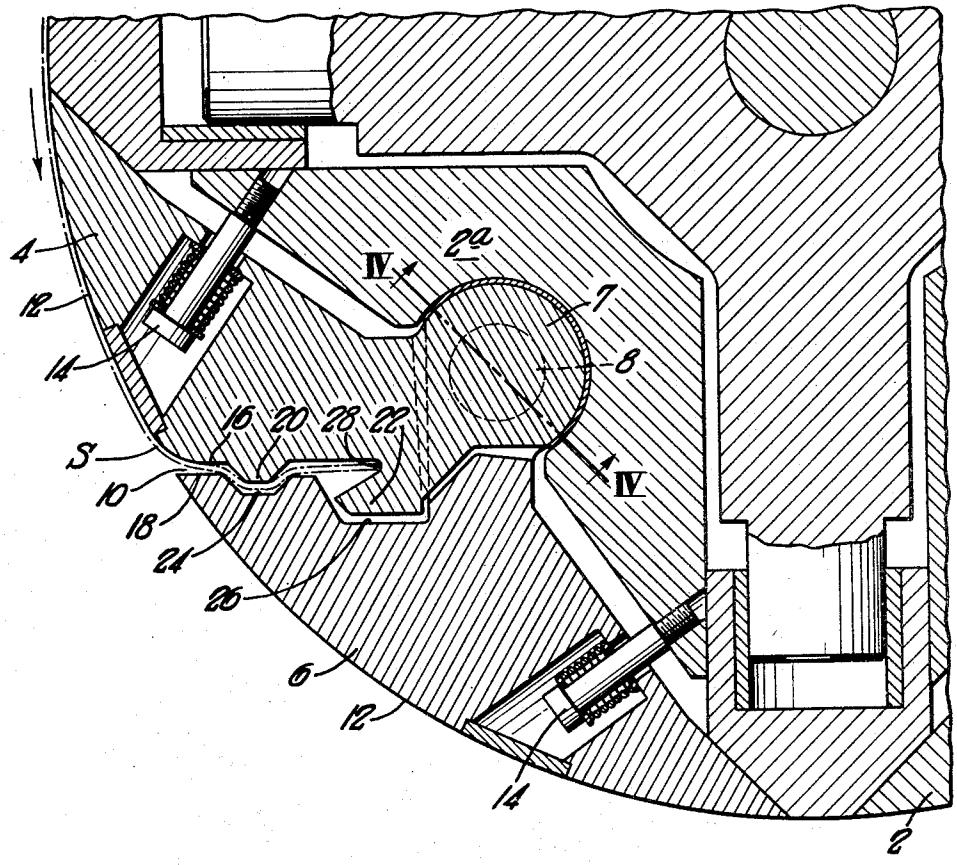
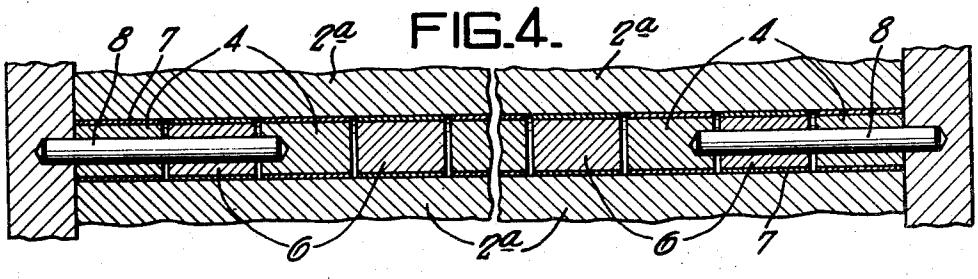


FIG. 4.



Inventor:
LOUIS F. STEPHAN,
by: Donald G. Dalton
his Attorney.

United States Patent Office

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GRIPPER JAWS FOR EXPANSIBLE MANDREL STRIP COILING REEL

Louis F. Stephan, Homestead, Pa., assignor to United States Steel Corporation, a corporation of New Jersey

Application May 21, 1954, Serial No. 431,358

1 Claim. (Cl. 242—72)

The present invention relates generally to metal rolling mill equipment and more particularly to an improved expansible mandrel type coiling reel.

Tension reels used for coiling steel strip following processing operations are generally of the expansible mandrel type. In this type of reel, the mandrel is expanded in diameter before the leading end of the strip is wound on the reel. Following completion of the winding operation, the mandrel is contracted and the completed coil, which has an inside diameter equal to the diameter of the expanded mandrel, is stripped from the contracted mandrel. When working with heavy gauge strip, it is necessary to add gripping means to the expansible mandrel for securing the leading end of the strip onto the reel and thus prevent slippage of the inner wrap of the bundle of strip as it is being wound on the reel.

Up to the time of my invention the mechanism utilized for gripping the strip on the mandrel consisted of two hinged jaw segments in the periphery of the mandrel. The jaw segments were so arranged that when the mandrel was in contracted position, an open slot, leading inwardly from the periphery of the mandrel, was presented across the width of the mandrel adapted to receive the leading end of the strip. When the mandrel was expanded, the jaw segments moved together to close the slot and securely grip the leading end of the strip to prevent slippage during initial build-up of the coil on the mandrel. When the coil was completely formed and the mandrel was contracted, the jaw segments moved apart opening the slot and freeing the leading end of the strip thus permitting the coil to be readily stripped from the mandrel. Considerable difficulty was experienced with this type of gripping means due to the accumulation of foreign matter, such as minute particles of steel, dirt, grease, etc., in the slot between the hinged ends of the jaw segments. This accumulation of foreign matter, which was difficult to remove effectively without dismantling the reel, interfered with the ready movement of the jaws and accelerated the effects of wear on the jaws.

It is, accordingly, an object of this invention to provide an expansible mandrel type coiler reel having novelly shaped jaw segments which insure positive gripping action and whose functioning is not readily subject to interference from accumulations of foreign matter therebetween.

This and other objects will become more apparent after referring to the following specification and attached drawings, in which:

Figure 1 is a cross-sectional view of an expansible mandrel type strip coiling reel showing the gripper jaw arrangement of my invention installed therein;

Figure 2 is an enlarged detail cross-sectional view of the gripper jaw portion of the reel of Figure 1 showing the mandrel in contracted position and the gripper jaws in open position;

Figure 3 is a view similar to Figure 2 showing the mandrel as expanded and the jaws in closed gripping position; and

Figure 4 is a sectional view taken on the line IV—IV of Figure 3 showing the hinged connection of the jaws and their mode of attachment with the arbor of the mandrel.

Referring more particularly to the drawings, reference numeral 2 designates the collapsible segments forming the arbor or main body of the expansible mandrel of a

strip coiling reel. Gripper jaws 4 and 6 are hinged together at 7 within segment 2*a* on common end pins 8 with a strip receiving slot 10 therebtween. The slot 10 extends inwardly from the outer periphery 12 of the mandrel toward the hinged connection 7. The two jaws 4 and 6 are attached to the central portion of the mandrel by means of spring loaded bolts 14. The hinged connection of the jaws 4 and 6 and their attachment to the segment 2*a* by means of the spring loaded bolts 14 cause the jaws to move toward each other and close slot 10 to grip the leading end of a strip "S" when the mandrel is expanded and move away from each other and open slot 10 when the mandrel is contracted.

All of the above features form no part of the present invention.

The jaws 4 and 6 are provided with opposed strip engaging surfaces 16 and 18, respectively, adjacent slot 10. Surface 16 is provided with a pair of radially spaced tongues or projections 20 and 22 while surface 18 is provided with mating grooves or recesses 24 and 26 for accommodating projections 20 and 22, respectively, when the jaws 4 and 6 are moved together to substantially close the slot 10, as shown in Figure 3.

Projection 22 is larger than projection 20 and is provided with a recess 28 on its side toward the outer periphery 12 of the mandrel. Projection 22 functions to prevent the entry of foreign matter into the hinged connection 7. The recess 28 also functions as a stop which prevents sticking of the strip "S" in the slot 10.

In operation, the mandrel initially is in contracted position as shown in the Figure 2. In this position the jaws 4 and 6 are open so that the end of the strip "S" may be inserted into the slot 10 with the leading edge thereof received in the recess 28. After the strip has been inserted in the slot 10, the mandrel is expanded which causes the jaws 4 and 6 to move together forcing the strip to be securely clamped into the groove 24 by the projection 20 and also between the remainder of the strip engaging surfaces 16 and 18, as shown in Figure 3. After coiling of the strip is completed, the mandrel is contracted causing the jaws 4 and 6 to part, as shown in Figure 2, to thus permit ready stripping of the coil from the mandrel.

While one embodiment of my invention has been shown and described, it will be apparent that other adaptations and modifications may be made without departing from the scope of the following claim.

I claim:

In an expansible reel mandrel for coiling strip material, said mandrel having a pair of first and second gripper jaw segments in the periphery thereof, said jaws being hingedly mounted on common pin means in the main body of said mandrel with a strip receiving slot therebetween extending transversely of said mandrel, said slot extending inwardly from the outer periphery of said mandrel toward the center thereof, means connecting said jaws with the main body of said mandrel whereby said jaws are moved toward each other to close said slot upon expansion of said mandrel and moved away from each other to open said slot upon contraction of said mandrel, said jaws having opposed strip engaging surfaces adjacent said slot the improvement therewith of a pair of radially spaced integral projections on the strip engaging surface of said first jaw extending into said slot, said second jaw being provided with a pair of spaced grooves in its strip engaging surface for receiving said projections when said jaws are moved together, one of said projections being disposed at the inner end of said slot adjacent the hinged connection of said jaws, said last named projection having a recess in the side thereof toward the outer periphery of said mandrel.

References Cited in the file of this patent

UNITED STATES PATENTS

1,905,192	Talbot	Apr. 25, 1933
2,061,109	Sieger	Nov. 17, 1936
2,211,472	Klein et al.	Aug. 13, 1940
2,454,984	Bader	Nov. 30, 1948