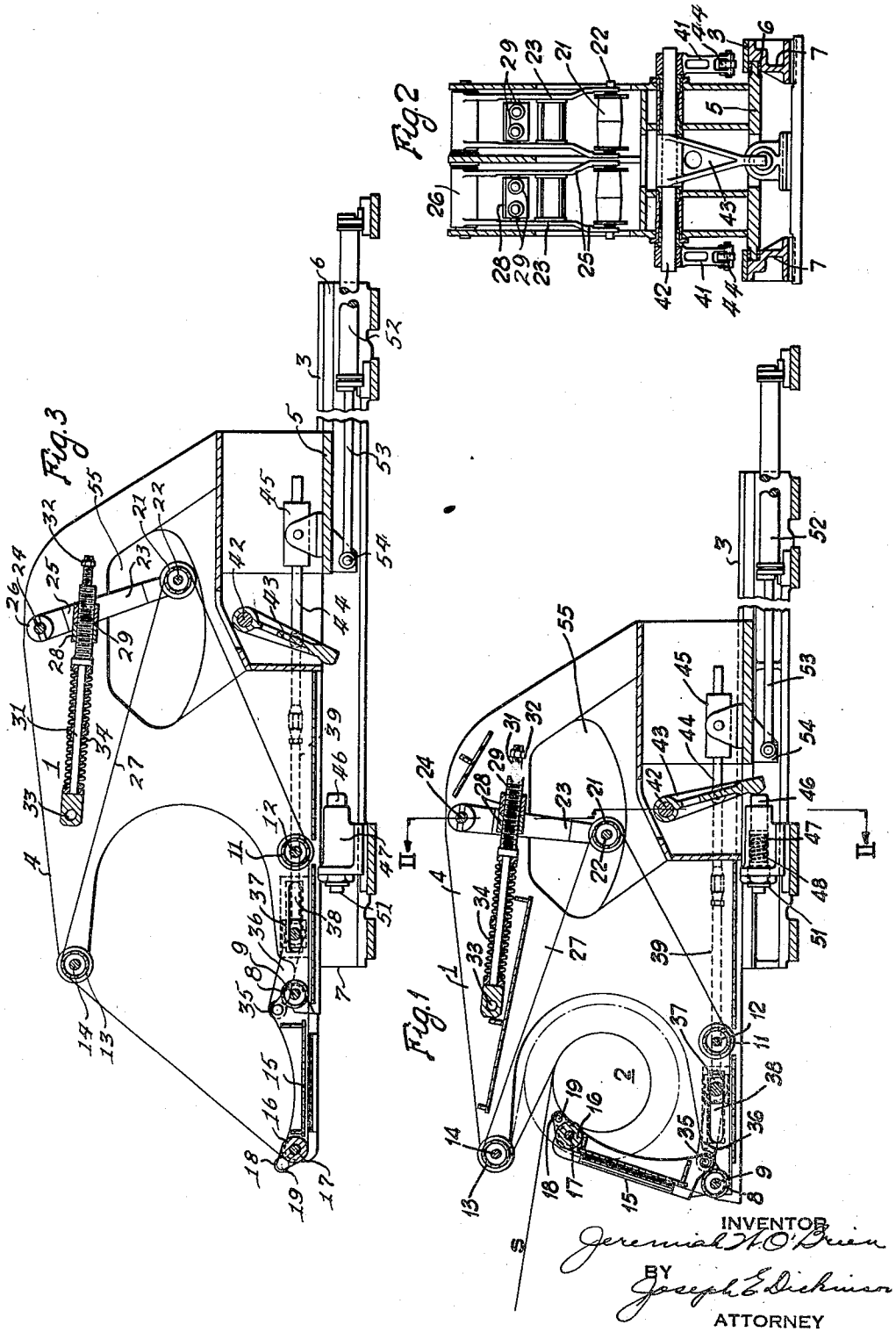
Feb. 2, 1943. J. W. O'BRIEN 2,309,781

BELT WRAPPER

Filed Aug. 4, 1940



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Patented Feb. 2, 1943 2,309,781

UNITED STATES PATENT OFFICE

2,309,781

BELT WRAPPER

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Application August 4, 1940, Serial No. 351,300

10 Claims. (Cl. 242—78)

This invention relates to an improvement in what is commonly referred to as a belt wrapper for use in automatically coiling a continuously moving strip on a reel or mandrel.

The conventional belt wrappers in use at present do not insure a tight first wrap around the reel, particularly when strip of thickness greater than tin plate gauge is being coiled. As a result, slipping of the coil sometimes occurs which gives rise to scoring of the surface of the strip. Furthermore, when there is slippage, tension can not be effectively applied to the strip and the resulting coils frequently are irregular in shape and consequently inconvenient to handle should further processing be desired. In addition, if the first wrap of material is loosely applied, the strip subsequently coiled on the reel causes wrinkling and buckling of the inner layers. Then, too, when the finished coil is stripped from the reel, if the center of the coil is loose, telescoping takes place.

According to this invention a belt wrapper is provided which so engages the strip that it is firmly held against the reel and a tight first wrap around the reel obtained, overcoming the defects referred to in the use of the conventional belt wrapper.

One object of this invention is to provide a means for rapidly engaging and disengaging a reel or mandrel whereby strip may be rapidly and efficiently coiled with the least amount of effort on the part of the operator.

Another object of this invention is to provide a belt wrapper for producing a tight first wrap around the coiling mandrel to prevent slipping and scoring of the strip being coiled.

Still another object of the invention is to provide a resilient means for causing one section of the belt wrapper to swing up into a position for engaging the mandrel and for positively holding the lower pivoted arm into engagement until the belt wrapper is withdrawn from the coiling to the non-coiling position.

These and the various other objects as well as the various novel features and advantages of the invention will become apparent when the following detailed description is read in conjunction with the accompanying drawing, of which;

Figure I is a vertical section of a belt wrapper embodying the invention, the section being taken axially of the unit in its reel engaging position,

Figure II is a sectional view taken at II—II of Figure I and,

Figure III is a side elevation showing the unit in its withdrawn or non-coiling position.

Referring in detail to the embodiment of the invention shown in the drawing the strip to be coiled is indicated by the letter S and a belt wrapper generally by the numeral 1, cooperating with a reel 2, being mounted for movement on a track 3 from its coiling to its non-coiling position.

As shown, the belt wrapper consists of two parallel side frames 4, having a C-shaped throat at one end, firmly secured to a base 5 which is freely slidable in ways 6 provided on parallel supports 7. Secured between the frames 4 are a plurality of shafts 9, 12 and 14 on which there are mounted a plurality of rollers 8, 11 and 13, the shafts being supported at their ends in suitable bearings in the parallel side frames 4. Pivotally mounted at the ends of shaft 9 is an arm 15 which carries at its opposite end rollers 16 mounted on a shaft 17, and guide rollers 18 supported on shaft 19. A second set of movable rollers 21 are mounted on the shafts 22 at the end of symmetrical arms 23 which are pivoted at their opposite ends on shaft 24 supported in suitable bearings in frames 4. Each arm 23 consists of two spaced members 25 welded at one end to a sleeve 26 and extended outwardly from each other at the opposite ends in order to span the roller 21 supported therebetween.

For engaging the strip a pair of continuous belts 27 are passed over their supporting rollers 9, 11, 21 and 13. Trunnion nuts 28 pivoted between arms 23 are threadably engaged by hollow sleeves 29 through which pass threaded rods 31 provided with adjusting nuts 32 at one end and pivoted on shaft 33 supported between the side frames 4 at the other. Compression springs 34 encircling the rods 31, are positioned between the pivot point of rods 31 and the threaded sleeves 29, and which constantly urge the pivoted arms 23 to the right and hence the belts are held taut at all times.

Adjacent to the pivoted ends of arms 15 are projections 35 to which rods 36 are pinned at one end. At the opposite end the rods 36 are secured to cross heads 37 which are restrained to slide in slots 38 provided in the main frames 4. Rods 39 are connected at one end to cross heads 37 and at their opposite ends are pivoted in yokes provided at one end of the arms 41 which are keyed to the ends of shaft 42 supported in suitable bearings in side frames 4. Intermediate the two arms 41, a V-shaped member 43 is keyed to the shaft 42 and extends in a downward di-

rection parallel to the arms 41. Secured to member 43 is a dash pot consisting of a piston rod 44 pivoted to member 43 and a cylinder 45 pivotally mounted between the side frames. Mounted beneath the belt wrapper is a spring-biased plunger 46 slidably mounted in a receptacle 47 containing a spring 48 which is adjustable by means of adjusting plug 51 threadably mounted in one end of the receptable 47.

A hydraulic motor 52, having a cooperating piston 53 which is connected to a boss 54 of base plate 5, is operable by supplying fluid pressure from a source not shown for moving the belt wrapper to and from the coiling position.

The apparatus having been described in detail, the operation of the invention may be briefly summarized as follows:

When the strip S is to be coiled on the reel 2, fluid pressure is applied to hydraulic motor cylinder 52 to move the belt wrapper 1 into the coiling position. As the belt wrapper is moved forward, the belts 27 engage the reel so that arms 23 pivot from their extreme right hand position as shown in Figure III in suitable openings 55 provided in side frames 4 into the position shown in Figure I and the arms 15 are pulled up to the reel engaging position. In order to prevent the arms from forcefully striking the reel, the dash pot which is pivotally connected to the V-shaped member 43, opposes the movement of the rods 39 and thus causes the arms 15 to rise more slowly to the reel engaging position. The spring biased plunger 46 is engaged by the V-shaped member 43 causing the spring to become compressed so that the necessary reactive force is supplied through shaft 42 to arms 41 and connecting rods 39 and links 36 to cause the rollers 16 to firmly engage the reel to provide a tight first wrap of material around the reel.

Upon completion of the first few wraps of the coil, during which time the rollers 16 firmly engage the reel, the belt wrapper is withdrawn by applying fluid pressure to the opposite end of hydraulic motor 52 which causes the belt wrapper to move to the right, the arms 15 to drop to their lowermost position and the pivoted arms 23 to swing to the right due to expansion of the compression spring 34 to take up the slack in the belts.

According to the provisions of the patent statutes, I have explained the principle and operation of my invention and have illustrated and described what I consider to represent its best embodiment. However, I desire to have it understood that, within the scope of the appended claims, the invention may be practiced otherwise than as specifically illustrated and described.

I claim:

1. In combination with a reel for coiling metallic strip, a belt wrapper comprising spaced vertical frames, a plurality of sets of rollers mounted therebetween over which a plurality of belts are restrained to pass, one set of rollers yieldably supported for maintaining the belt taut at all times, a second set of rollers pivotally mounted for engaging said reel, and a means for maintaining the last mentioned rollers in positive engagement with the reel.

2. In combination with a reel for coiling metallic strip, a belt wrapper comprising spaced vertical frames, a plurality of rollers over which a belt is restrained to pass, one of the rollers secured to a pivotal support for maintaining the belt taut at all times, a second roller pivotally mounted between said frames, and a means for maintaining said last mentioned roller in positive engagement with the reel.

3. In combination with a reel for coiling metallic strip, a belt wrapper comprising spaced vertical frames, a plurality of sets of rollers mounted therebetween over which a belt is restrained to pass, means for maintaining the belt taut, one set of rollers secured to a pivotal support for movement into and out of engagement with the reel, yieldable means opposing the movement of said last mentioned pivotal support, and means for maintaining said set of rollers in positive engagement with the reel.

4. In combination with a reel for coiling metallic strip, a belt wrapper comprising a pair of parallel spaced frames, a plurality of sets of rollers supported therebetween and over which a plurality of belts are restrained to pass, means for simultaneously maintaining the belts taut, a pivotal support for causing one set of rollers to engage and said belts to encircle said reel, yieldable means connected to said pivotal support for opposing its motion, and yieldable means comprising a spring-biased plunger associated with a series of links for urging said pivotal support into positive engagement with said reel.

5. In combination with a reel for coiling metallic strip, a belt wrapper comprising a pair of parallel spaced frames, a plurality of rollers over which a plurality of belts are restrained to pass, means comprising a spring-biased pivotal roller support for simultaneously maintaining the belts taut, a belt positioning means for engaging said reel and a means for maintaining said positioning means in positive relationship with said reel.

6. In combination with a reel for coiling metallic strip, a belt wrapper comprising a pair of spaced parallel frames, a plurality of sets of spaced rollers supported therebetween, a plurality of belts restrained to pass over said rollers, means for positioning said belt wrapper into cooperative relationship with said reel, means for applying a tension simultaneously to said belts, pivoted means for positioning one set of said spaced rollers into cooperative relationship with said reel, yieldable means for opposing the movement of said last mentioned means, and means connected to said pivoted means for maintaining the last mentioned set of rollers into cooperative relationship with the reel.

7. For use in coiling elongate strip material upon a rotatable reel, a frame consisting of spaced parallelly disposed side members joined together by interconnecting cross members, means for moving said frame toward and away from the reel, the reel end of the side members being cut away to receive the reel when the frame is moved into strip-guiding position, a plurality of transversely extending rolls mounted in said side members on opposite sides of said reel-receiving opening, arm-like projections pivotally secured to the reel ends of said side members on one side of said reel-receiving opening, a roller mounted in the free ends of said arm, another roller mounted in a second pair of arms pivotally secured to said side members rearwardly of said reel-receiving opening, a continuous belt extending around said rollers and adapted to pass around a major portion of the reel when the frame is moved to its reel-engaging position, means engaging said second-mentioned arms and disposed to normally urge the roller carried thereby in a direction to maintain the belt under tension, means for positively moving said first-mentioned roller supporting arms to cause the

roller carried thereby to engage the reel when the frame is moved toward the reel, and means disposed to engage said last-mentioned means and effect the operation thereof as the frame is moved toward the reel.

8. The combination, according to claim 7, including means cooperating with said second-mentioned arms for adjusting the tension in the belt.

9. The combination, according to claim 7, in which the means disposed to engage said last-mentioned means to effect the operation thereof is resiliently mounted.

10. The combination, according to claim 7, including means disposed for opposing movement of said means for positively moving said first-mentioned roller-supporting arms to prevent said arms from rising too rapidly and engaging the reel with a suddent impact.

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