July 27, 1943. A. C. GOINS 2,325,504

BELT WRAPPER GUARD

Filed Jan. 7, 1942 2 Sheets-Sheet 1

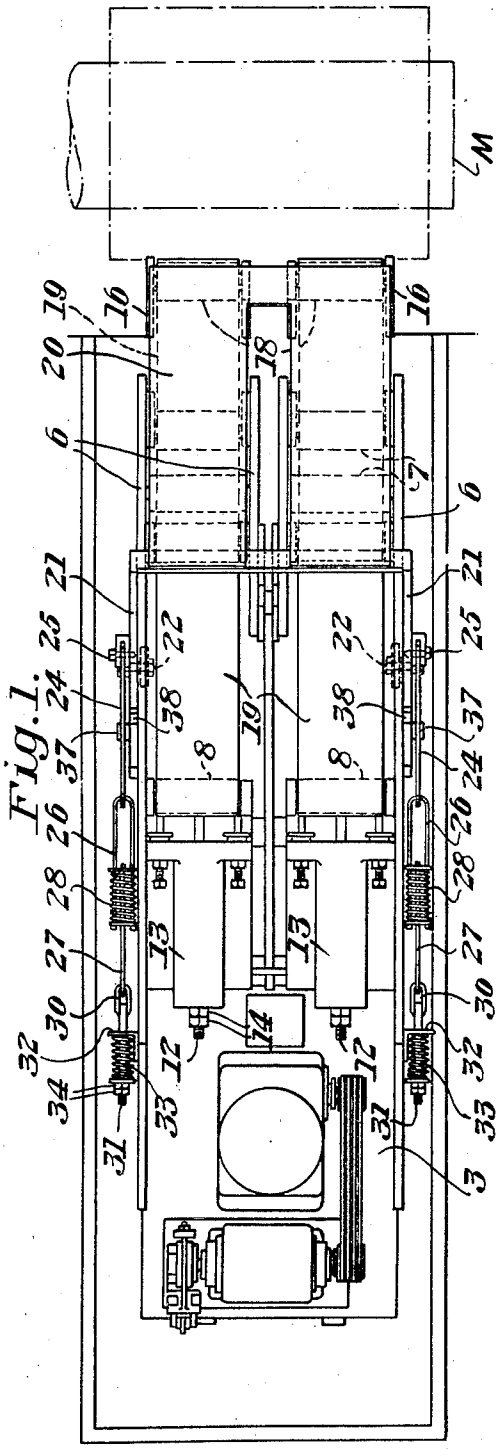


Fig. 1.

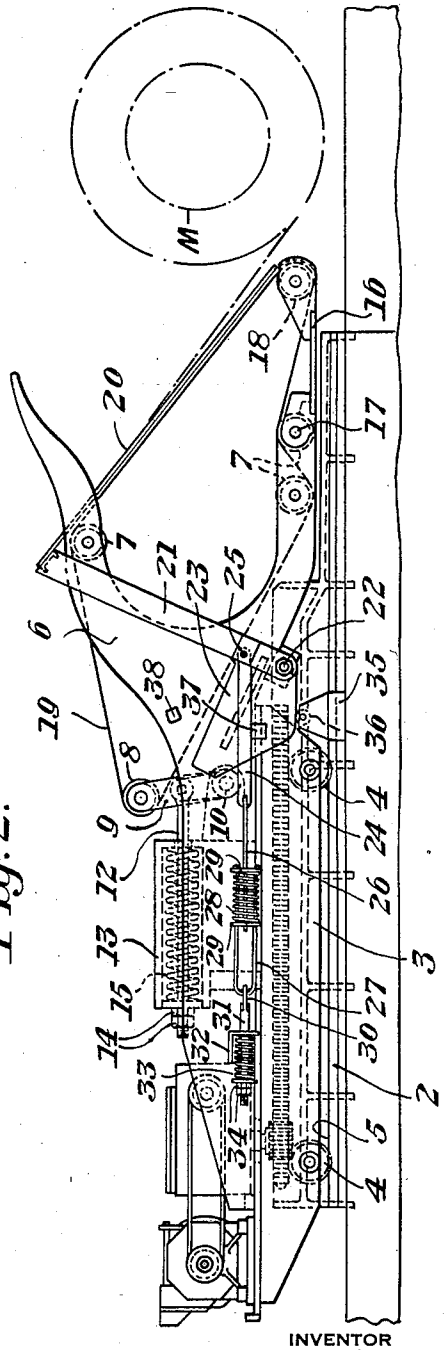


Fig. 2.

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Filed Jan. 7, 1942 2 Sheets-Sheet 2

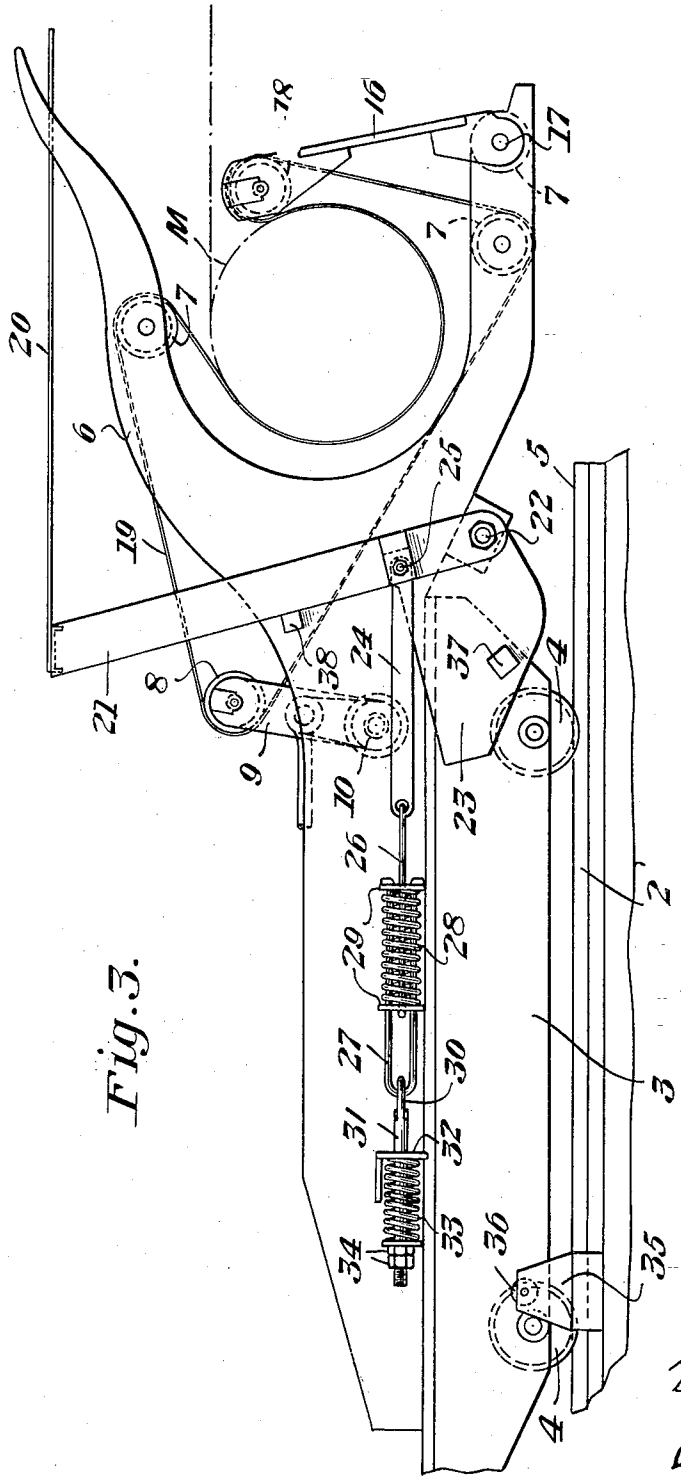


Fig. 3.

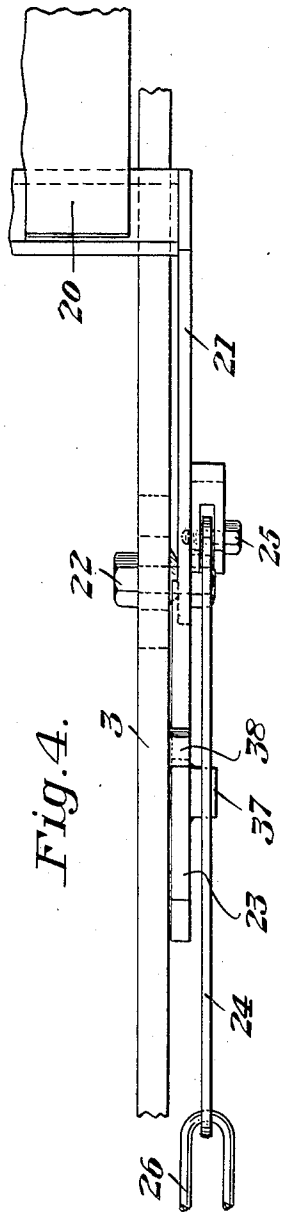


Fig. 4.

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BELT WRAPPER GUARD

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Application January 7, 1942, Serial No. 425,939

7 Claims. (Cl. 242—78)

This invention relates to guards and, particularly, to an improved automatic guard or means for protecting the belts of belt wrapper apparatus.

In the steel industry, it is the general practice to provide a winding reel on the exit or delivery side of rolling mills for rolling sheet material for the purpose of rewinding the reduced strip into a coil under tension as the material is delivered from the work rolls of the mill. The mandrel portion of the reel is usually cylindrical in shape and made of a plurality of segments which are capable of being expanded and contracted, whereby the diameter of the reel may be varied so as to facilitate removal of the coil therefrom after reeling.

At times, a belt wrapper device or apparatus is utilized for the purpose of starting the initial convolutions of the strip around the mandrel. Such a device is usually located at a point directly opposite the reeling mechanism and consists generally of a pair of spaced apart endless belts arranged substantially parallel to each other on a movable carriage. The belts are arranged around a plurality of idle rolls. When the strip is to be started around the mandrel of the reel, the carriage of the belt wrapper, together with the belts carried thereby, is moved to position directly next to the reeling mechanism so that the belts are disposed circumferentially and partially around the mandrel thereof. The exiting end of the strip is then inserted between the belts and the mandrel. The mandrel is then rotated and the belts guide the exit end of the strip around the mandrel so as to wrap the same sufficiently tight to form the initial convolutions of the coil. After several convolutions of the strip have been wrapped around the mandrel, the belt wrapper mechanism is moved to a retracted position away from the reeling mechanism with the belts thereof moving away from the mandrel and out of contact with the same. The rolling of the strip is continued and tension is applied to the portion of the strip between the rolling mill and the mandrel in a well known manner, in order to provide the proper rolling conditions.

After the rolling of the strip has been completed, the tail end of the strip, upon leaving the rolls of the mill, tends to be whipped over the reeling mandrel, due to the rotation thereof and the tension applied to the strip thereby, causing the extreme tail end of the strip to strike the belts of the belt wrapper mechanism, which are positioned directly opposite thereto, with a terrific force or blow, which results oftentimes in damaging or completely severing the belts. Such a condition is, of course, unsatisfactory in that production is retarded, due to the time consumed in repairing or replacing the damaged belts. Furthermore, the replacement and maintenance of these belts is tedious and expensive. It is to a guard or means for protecting these belts from this whipping action of the tail end of the strip that the present invention relates.

Accordingly, it is the general object of the present invention to provide a guard or means for protecting the belts of a belt wrapper mechanism of the class described which effectively and efficiently protects the belts thereof against the whipping action of the tail end of the strip as it is delivered from the rolling mill so as to eliminate the danger of any damage thereto and to reduce the maintenance costs thereof to a minimum.

It is another object of the invention to provide an improved guard or means for protecting the belts of a belt wrapper mechanism of the class described, which is simple and inexpensive in its construction and use, and a guard which will not interfere with the normal operation of the belt wrapper.

It is a further object of this invention to provide an improved guard or means for protecting the belts of a belt wrapper mechanism of the class described which is automatically moved to one position away from the belts so as to permit the use thereof and automatically moved to another position adjacent the belts so as to protect the same.

Various other objects and advantages of this invention will become more apparent during the course of the following specification and will be particularly pointed out in the appended claims.

In the accompanying drawings there is shown, for the purpose of illustration, one embodiment which my invention may assume in practice.

In these drawings:

Figure 1 is a plan view of the improved guard of my invention showing it incorporated with a conventional type belt wrapper;

Figure 2 is a side elevational view thereof showing the guard in position for protecting the belts of the belt wrapper when the same is in its retracted position and not in use;

Figure 3 is an enlarged similar view showing the guard in the position it will assume away from the belts of the belt wrapper when the same is in use; and

Figure 4 is an enlarged plan view of one side of my improved guard.

Referring more particularly to the drawings, the improved guard of my invention is shown incorporated with a conventional type belt wrapper, such as disclosed in the patent to Beard et al. No. 2,262,160. Such a belt wrapper consists generally of a base 2 which is permanently mounted on the floor at the delivery end of the rolling mill with which it is adapted to be used, and at a point directly beyond the mechanism for reeling the strip material as it is delivered from the mill. There is mounted on the base 2 a carriage 3 for reciprocal movement away from and toward the mill and reeling mechanism. The carriage 3 has arranged therewith a plurality of wheels 4 which are disposed on a pair of spaced apart tracks or guide members 5 carried by the base 2. On the inner end of the carriage 3, directly opposite the reeling mechanism, there are arranged usually two sets of spaced apart yoke-like portions 6. Each of these sets consists of a pair of yoke-like portions having a plurality of idle rollers 7 arranged therebetween. Immediately rearwardly of each set of yoke-like portions 6 there is arranged an idle roller 8 which is mounted on the upper end of an upwardly extending arm-like member 9, with the lower end of the arm-like member pivotally attached to the carriage 3 as at 10. Intermediate the length of the arm-like member 9 there is pivotally attached thereto a rearwardly extending crank arm 12 which extends through a housing portion 13 mounted on the carriage 3 and which has adjusting nuts 14 arranged on the extreme end thereof. There is mounted within the housing 13 around the crank arm 12 a coil spring 15 for a purpose hereinafter to be described. On the lower arm of each set of the yoke-like portions 6 at the forward end of the carriage, there is arranged a pair of spaced apart arm-like members 16 which are pivotally attached to the lower arm of the yoke-like portions, as at 17. Between each pair of arm-like portions 16 and at the outer end thereof, there is mounted an idle roller 18. There is arranged between the yoke-like portions 6 of each set, around the idle rollers 7, 8, and 18 thereof, an endless belt 19, and it is to a guard or means for protecting these belts that the present invention relates.

According to the present invention, as more clearly shown in Figures 3 and 4 of the drawings, there is arranged above each of the endless wrapper belts 19 an angularly extending plate-like guard member 20 having a pair of spaced apart downwardly extending arms 21 arranged therewith, with one arranged at each side of the guard. The arms 21 extend preferably downwardly along the outer sides of the belts 19 and the yoke-like portions 6, with the lower ends thereof being pivotally attached to the carriage 3 of the belt wrapper mechanism as at 22. There is mounted, preferably on the outer side of each of the arms 21 at the lower ends thereof, a cam-like member 23 for actuating the guard in a manner hereinafter to be described. Above the pivotal connection 22 of the arms 21 of the carriage 3, there is arranged with each of the arms a rearwardly extending link member 24 having one end thereof pivotally attached to the arm-like member 21, as at 25. At the opposite end of each of the link members 24, there is connected thereto a rod 26 which extends between the legs of a U-shaped link member 27 and is connected thereto preferably by means of a coil spring 28 and flange members 29. The outer end of each of the U-shaped link members 27 is connected to an eye portion 30 of a bolt 31. The bolt 31 extends through a hole arranged preferably in an angle iron or bracket member 32 which is securely mounted on the side of the carriage 3 of the belt wrapper. Beyond the angle iron member 32, there is arranged around each of the bolts 31 a coil spring 33. Beyond the spring 33 on the extreme outer threaded end of each of the bolts 31, there is mounted a pair of adjusting nuts 34.

To either side of the belt wrapper mechanism and at a point directly opposite the cam-like members 23 carried by the arms 21, there is securely mounted on the floor a bracket member 35 preferably having a roller 36 rotatably arranged on the upper end thereof, which is adapted to act as a cam follower in a manner hereinafter to be described.

On the outer face of each of the cam-like members 23, there is arranged preferably a lug portion 37, preferably in the form of a steel block welded to each of the cam-like members, for supporting the link members 24 when the guard is in its position adjacent the belts 19, as shown in Figure 2 of the drawings. It is the purpose of the lugs 37 to prevent the link members 24, together with the other portions of the guard, from vibrating or slapping after the guard has been lowered to its guarding position over the belts 19. On the inner side of each of the yoke-like portions 6 of the carriage 3 of the belt wrapper, there is disposed a similar lug portion 38 which also consists preferably of a steel block welded to the inner side of the yoke-like portions and which is adapted to cooperate with the outer side of the arms 21 so as to limit the movement of the guard upwardly and away from the belts 19, as shown in Figure 3 of the drawings.

The improved guard of the present invention operates in the following manner. The guard is normally in the position shown in Figures 1 and 2 of the drawings, with the plate-like portion 20 thereof disposed over, adjacent to, and substantially parallel to the wrapper belts 19. In such position, the cam-like members 23 are in contact with their respective rollers 36 carried by the brackets 35 mounted on the floor, and the guard is held in such position through the cooperation thereof against the action of the springs 28 and 33. That is, when the guard is in this position, both the springs 28 and 33, arranged with the link members 24, are under compression and loaded.

It will be understood that when it is desired to use the belt wrapper mechanism, the carriage 3 is moved forwardly or protracted toward the reeling mechanism, as shown in the broken lines of the drawings, positioned between the rolling mill (not shown) and the belt wrapper mechanism. As the belt wrapper is moved forwardly, it will be seen that the cam-like members 23 will pass over and follow the rollers 36 and eventually move out of contact therewith. The guard is then permitted to be moved upwardly away from the belts 19, with the arms 21 moving about the pivotal connection 22 thereof to the position as shown in Figure 3 of the drawings. The guard 20, together with the arms 21, is caused to move to such position, due to the action of the springs 28 and 33, which have been loaded as previously described. The springs 28 and 33 move the guard upwardly and rearwardly until the arms 21 strike the stop lugs 38 arranged on the inner sides of the yoke-like portions 6 of the carriage. These springs will maintain the guard in a retracted

position and against the stop lugs 38 while the belt wrapper is being used. It will be understood that after the belt wrapper has moved to its most forward position and the guard has moved away from the belts, the belts 19 will be disposed partially around the mandrel M of the reeling mechanism, as shown in Figure 3 of the drawings, with the rollers 18 carried by the arm-like members 16 having been moved upwardly around the inner side of the mandrel about their respective pivotal connections 17. It will be understood that the belts 19 are always held taut by means of the spring 15 and that the belts are held thereby securely around the periphery of the mandrel M.

The exit end of the strip being rolled by the rolling mill is then threaded between the mandrel and the belts 19 in a well known manner. Thus, it will be seen that the initial convolutions of the strip are securely wrapped around the mandrel M by means of the belts 19. After a sufficient number of convolutions of the strip has been wrapped around the mandrel, the carriage 3 which carries the belt wrapper mechanism is moved to a retracted position away from the rolling mill and reeling mechanism and the mandrel M. As the belt wrapper approaches its initial or normal position, as shown in Figure 2 of the drawings, the cam-like members 23 will strike their respective rollers 36 arranged along the sides of the belt wrapper. On continued movement of the belt wrapper, the rollers 36 will follow the edge of the cam-like members 23, thereby forcing the guard 20, together with the arms 21 arranged therewith, about the pivotal connections 22 and against the action of the springs 28 and 33 until the guard 20 is moved to position adjacent the belts 19. It will be seen that as the guard rotates about the pivotal connection 22, the lugs 37, carried by the cam-like members 23, will move upwardly and, at about the same time the guard has reached its lowermost position adjacent the belts, the lugs 37 will strike the bottom of the link members 24, thereby preventing any whipping action thereof. It will be seen that the springs 28 tend to act as a cushion so that the guard will not be forced to its guarding position with an undue amount of force.

It will be understood that as the tail end of the strip leaves the rolling mill after the strip has been completely coiled, the mandrel M of the reeling mechanism will carry the end portion of the strip therearound with a whipping action which is extremely forceful. Heretofore, as has been explained, the tail end of the strip would strike the belts 19, due to the location thereof adjacent the reeling mechanism, as there was nothing to prevent such tail end from striking the same. By means of the present invention, it will be seen that when the guard 20 is in position over and adjacent to the wrapper belts 19, as shown in Figures 1 and 2 of the drawings, the guard will prevent the tail end of the strip from coming in contact with the belts. That is, the tail end of the strip, instead of striking the belts, will strike the top surface of the guard, as shown in Figure 2. Accordingly, it will be seen that the belts 19 are safely protected from the whipping action of the tail end of the strip.

As a result of my invention, it will be seen that there is provided a guard for belt wrappers which is simple and effective in its use and, at the same time, a guard which may be easily and conveniently incorporated with existing belt wrappers.

While I have shown and described one specific embodiment of my invention, it will be understood that this embodiment is merely for the purpose of illustration and description and that various other forms may be devised within the scope of my invention, as defined in the appended claims.

I claim:

1. In combination with a belt wrapper mechanism of the class described including a plurality of spaced apart horizontally disposed rollers having at least one endless belt arranged thereabout with a portion thereof between the rollers adapted to partially encircle a coiling or reeling member, means for protecting that portion of the belt adapted to partially encircle the coiling member from the whipping action of the tail end of the coiled strip comprising a guard member, means for pivotally attaching said guard member to the belt wrapper mechanism, means for moving said guard member to one position over the wrapper belt so as to protect the same, and means for moving said guard member away from the wrapper belt to another position.

2. In combination with a belt wrapper mechanism of the class described including a plurality of spaced apart horizontally disposed rollers having at least one endless belt arranged thereabout with a portion thereof between the rollers adapted to partially encircle a coiling or reeling member, means for protecting that portion of the belt adapted to partially encircle the coiling member from the whipping action of the tail end of the coiled strip comprising a guard member, means for pivotally attaching said guard member to the belt wrapper mechanism, means for moving said guard member to one position over the wrapper belt so as to protect the same, means for moving said guard member away from the wrapper belt to another position, and means for holding and positioning said guard member in the position away from the wrapper belt.

3. In combination with a belt wrapper mechanism of the class described including a plurality of spaced apart horizontally disposed rollers having at least one endless belt arranged therearound with a portion thereof between the rollers adapted to partially encircle a coiling or reeling member, means for protecting that portion of the belt adapted to partially encircle the coiling member from the whipping action of the tail end of the coiled strip, as defined in claim 1, wherein the means for moving the guard member to position over the wrapper belt consists of a cam member arranged with the guard member, and stationary means arranged adjacent the belt wrapper and guard member which is adapted to cooperate with said cam member to move the guard member to one position over the belt when the cam member together with the guard member carried by the belt wrapper is moved relative to said stationary means.

4. In combination with a belt wrapper mechanism of the class described including a plurality of spaced apart horizontally disposed rollers having at least one endless belt arranged therearound with a portion thereof between the rollers adapted to partially encircle a coiling or reeling member, means for protecting that portion of the belt adapted to partially encircle the coiling member from the whipping action of the tail end of the coiled strip, as defined in claim 1, wherein the means for moving the guard member to position away from the belt wrapper consists of a plurality of coil springs.

5. In combination with a belt wrapper mecha-

nism of the class described including a plurality of spaced apart horizontally disposed rollers having at least one endless belt arranged therearound with a portion thereof between the rollers adapted to partially encircle a coiling or reeling member, means for protecting that portion of the belt adapted to partially encircle the coiling member from the whipping action of the tail end of the coiled strip comprising an angularly arranged guard member which is adapted to be disposed over the belt, a pair of outwardly extending spaced apart arms carried by said guard member with one arranged to each side thereof, the outer ends of said arms being pivotally attached to the belt wrapper mechanism, a cam member arranged with and securely attached to each of said arms adjacent the outer ends thereof, a cam follower securely mounted opposite each of said cam members at each side of the belt wrapper and the guard member carried thereby, said cam members adapted to cooperate with said cam followers to move the guard member to one position over the wrapper belt when the wrapper belt together with the guard member carried thereby are moved so that the cam members contact the cam followers, and means for moving the guard member away from the wrapper belt to another position.

6. In combination with a belt wrapper mechanism of the class described including a plurality of spaced apart horizontally disposed rollers having at least one endless belt arranged therearound with a portion thereof between the rollers adapted to partially encircle a coiling or reeling member, means for protecting that portion of the belt adapted to partially encircle the coiling member from the whipping action of the tail end of the coiled strip, as defined in claim 5, wherein the means for moving the guard member to position away from the wrapper belt consists of an outwardly extending link arranged with each of the arms with one end of each of said links being pivotally connected to their respective arms, and at least one coil spring connected to the opposite end of each of said arms, said coil springs adapted to be normally loaded and adapted to move the guard to position away from the wrapper belt and to hold the same in said position.

7. In combination with a belt wrapper mechanism of the class described including a plurality of spaced apart horizontally disposed rollers having at least one endless belt arranged therearound with a portion thereof between the rollers adapted to partially encircle a coiling or reeling member, means for protecting that portion of the belt adapted to partially encircle the coiling member from the whipping action of the tail end of the coiled strip comprising a guard member consisting of a plate-like member which is adapted to be disposed over the wrapper belt, a pair of downwardly extending spaced apart arm-like members with one arranged at each side of said guard member with the lower ends thereof being pivotally connected to the belt wrapper mechanism to either side thereof, means arranged with said arms for moving the guard member together with the arms about their pivotal connection so that the guard member is disposed in one position over the wrapper belt, and means connected to said arms for moving the guard together with the arms about their pivotal connection so that the guard member is away from the wrapper belt in another position.

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