

March 15, 1949.

F. K. SCHEFE

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METHOD AND APPARATUS FOR FEEDING STRIPS

Filed Dec. 20, 1944

2 Sheets-Sheet 1

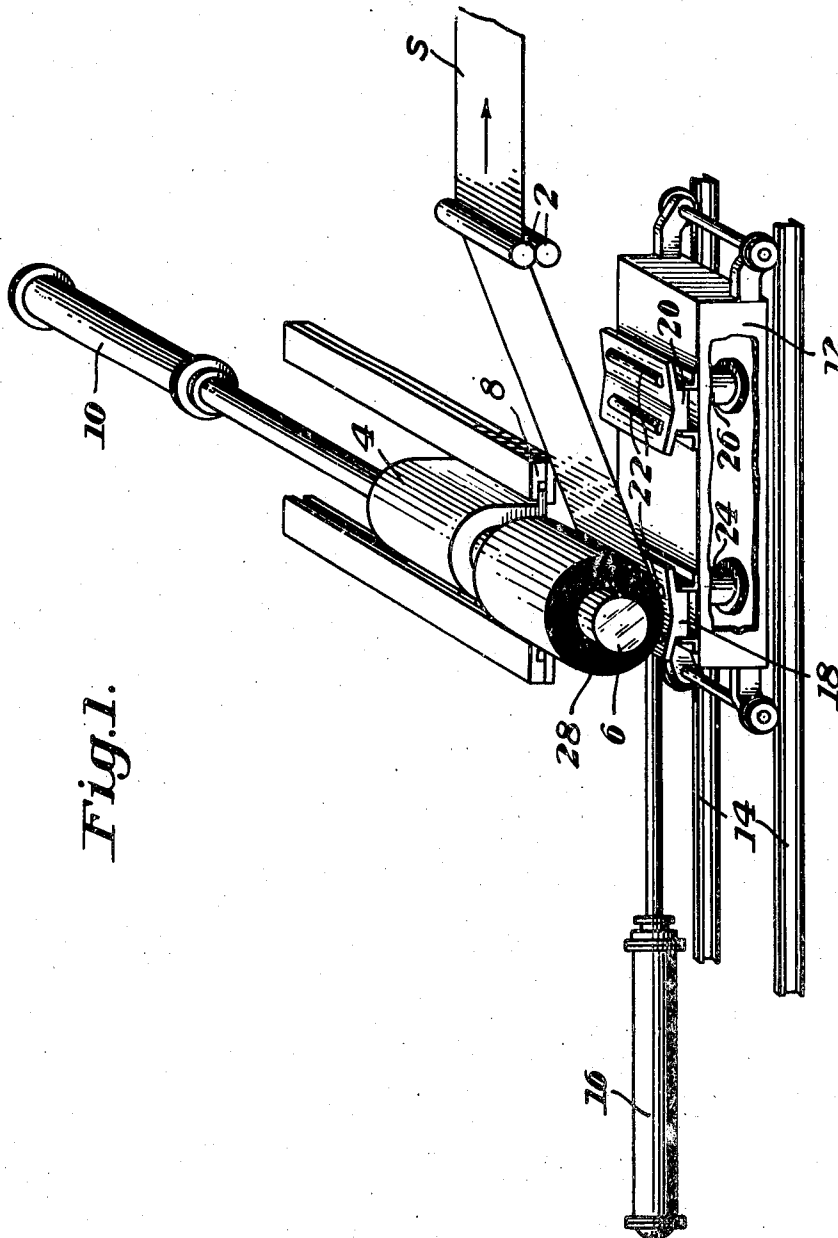


Fig. 1.

INVENTOR
FREDERICK K. SCHEFE,
by: *John E. Jackson*
his Attorney.

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F. K. SCHEFE

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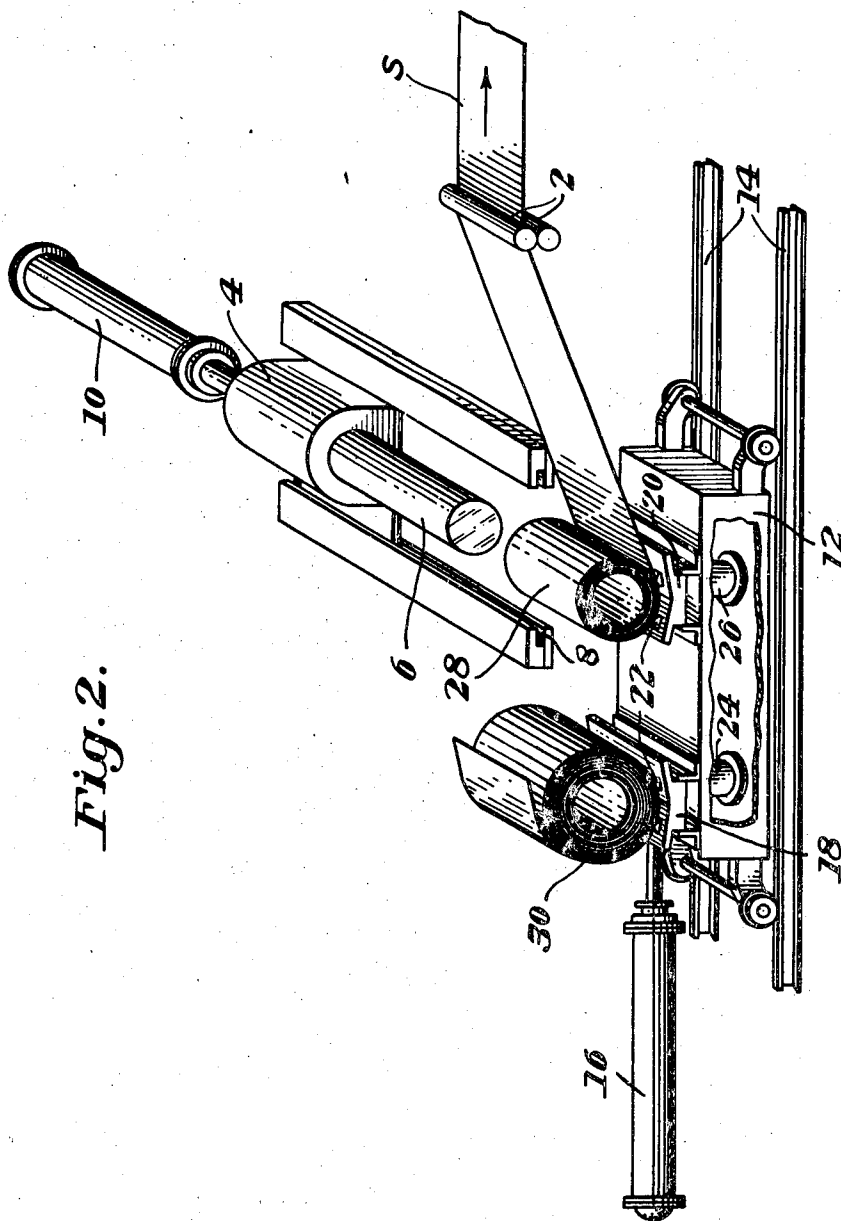


Fig. 2.

INVENTOR
FREDERICK K. SCHEFE,
by: *John E. Jackson*
his Attorney.

UNITED STATES PATENT OFFICE

2,464,464

METHOD AND APPARATUS FOR FEEDING STRIP

Frederick K. Schefe, Gary, Ind., assignor to Carnegie-Illinois Steel Corporation, a corporation of New Jersey

Application December 20, 1944, Serial No. 569,032

7 Claims. (Cl. 242—78)

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This invention relates to a method and apparatus for feeding strip and especially to continuously feeding coils of strip to strip processing apparatus.

In various strip processing lines the strip is fed continuously through the line and any stoppage of the line is detrimental to the processing of the strip. Therefore, it is necessary to prepare a coil of strip for feeding before the strip from the previous coil has been entirely fed to the processing line. The present practice is to provide duplicate high cost uncoilers which are in use only part of the time. While uncoiling the first part of the coil, it is necessary to support the inside of the coil by means of the uncoiler due to the great weight of the coil and the high speeds at which the strip is fed. After the majority of the strip has been uncoiled, however, it can be uncoiled without internal support.

It is an object of my invention to provide a method of continuously feeding coils of strip to the processing line while using a single uncoiler, thus greatly reducing the cost of the equipment.

Another object is to provide apparatus for carrying out the method.

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

Figure 1 is a perspective view showing a coil being fed while supported internally by means of the uncoiler; and

Figure 2 is a view similar to Figure 1, but showing the apparatus in a different position.

Referring more particularly to the drawings, the reference numeral 2 indicates a pair of pinch rolls through which the strip S passes to the processing line. On the entry side of the pinch rolls 2 and to one side of the strip S is an uncoiler 4 having a mandrel 6 for supporting a coil of strip internally. It will be understood that the mandrel type uncoiler may be replaced by any other standard type. The uncoiler 4 is adapted to be moved on slides 8 to and from the coils of strip which are being unwound by means of a hydraulic motor 10. Located in line with the strip S on the entry side of pinch rolls 2 is a carriage 12, which is adapted to be moved to and from the pinch rolls on tracks 14 by means of a hydraulic motor 16. A pair of spaced apart coil supports 18 and 20 are supported on the carriage 12 and are provided with rollers 22 for supporting the coils. Hydraulic motors 24 and 26 are provided to raise the coil supports 18 and 20, respectively.

My method is performed as follows:

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A coil of strip 28 is placed on the coil support 18 with its outer surface supported on rollers 22. The uncoiler 4 is then moved toward the coil of strip by means of the hydraulic motor 10 until the coil is engaged internally by the mandrel 6 as shown in Figure 1, after which the strip S is fed through the pinch rolls 2 to the processing line. The strip is then uncoiled while supported internally, the coil support 18 being moved to its lower position. Sometime before the majority of the coil of strip 28 has been unwound, the carriage 12 is moved to its retracted position by means of hydraulic motor 16, as shown in Figure 2 and a second coil of strip 30 placed on coil support 18. When the majority of the coil 28 has been unwound and it is no longer necessary to support it internally, the coil support 22 is raised by means of hydraulic motor 26 until the coil 28 is supported thereon. The mandrel 6 is retracted, the carriage 12 moved forward until the coil 30 is in line with the uncoiler 4 and the support 18 raised by hydraulic motor 24 until its axis is on the same level as the axis of mandrel 6 which is then moved forwardly to support the coil 30 internally. The end of the coil of strip 30 is moved into position adjacent the usual welder or stitching mechanism (not shown) where it is welded to the end of strip 28 after the coil 28 has been completely unwound. In order to insure continuous movement of the strip through the processing line, a second pair of pinch rolls may be provided adjacent the first pair to feed the end of the coil of strip 30 to the welder. The support 18 is then lowered and the strip from coil 30 fed to the strip processing line while supported internally on the mandrel 6, at which time the various parts of the apparatus are in the position shown in Figure 1. The carriage 12 is retracted, a new coil placed on the coil support 18 and the cycle of operations repeated.

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 claims.

I claim:

1. Apparatus for feeding coils of strip comprising an uncoiler for supporting a coil to be fed, a movable carriage, a pair of spaced apart coil supports mounted on said carriage, means for moving the carriage longitudinally of the path of the strip to bring the supports selectively into line with the uncoiler, means for raising and lowering said coil supports to bring the axis of the coils supported thereon into line with the axis of the

uncoiler, and means for moving said uncoiler to and from said coils supported on said supports.

2. The method of continuously feeding coils of strip to a processing line while using a single uncoiler which comprises supporting a coil of strip on its outer surface, moving the uncoiler to support the coil internally, uncoiling the strip supported on the uncoiler, placing a second coil supported on its outer surface adjacent the first coil, removing the uncoiler from the first coil and again supporting it on its outer surface after the majority of the strip therein has been uncoiled, continuing feeding the first coil while supported on its outer surface, causing relative movement between the coils and uncoiler to take the first coil and uncoiler out of axial alignment and bring the second coil and uncoiler into axial alignment, moving the uncoiler to support the second coil internally, and uncoiling the strip from the second coil when the feeding of the first coil is completed.

3. The method of continuously feeding coils of strip to a processing line while using a single uncoiler which comprises supporting a coil of strip on its outer surface, moving the uncoiler to support the coil internally, uncoiling the strip supported on the uncoiler, placing a second coil supported on its outer surface adjacent the first coil, removing the uncoiler from the first coil and again supporting it on its outer surface after the majority of the strip therein has been uncoiled, continuing feeding the first coil while supported on its outer surface, causing relative movement between the coils and uncoiler to take the first coil and uncoiler out of axial alignment and bring the second coil and uncoiler into axial alignment, moving the uncoiler to support the second coil internally, uncoiling the strip from the second coil when the feeding of the first coil is completed, placing a third coil supported on its outer surface adjacent the second coil, and repeating the steps.

4. Apparatus for feeding and uncoiling coils of strip comprising an uncoiler for supporting a coil internally during initial uncoiling thereof, a pair of supports spaced apart longitudinally of the path of the strip for rotatably supporting the coils on their outer surfaces, one of said supports supporting a second coil thereon, means for removing the uncoiler from the first coil after the majority of the strip therein has been uncoiled and placing the partially unwound coil on the second of said supports for the remainder of the uncoiling, and means for causing relative movement between the supports and uncoiler to take the first coil and uncoiler out of axial alignment and bring the axis of the second coil into line with the axis of the uncoiler.

5. Apparatus for feeding coils of strip comprising an uncoiler for supporting a coil internally during initial uncoiling thereof, a pair of supports spaced apart longitudinally of the path of the strip for rotatably supporting the coils on their outer surfaces, said coil being supported

on one of said supports for uncoiling after the majority of the strip therein has been uncoiled, means for causing relative longitudinal reciprocating movement between the uncoiler and supports to selectively move each of said supports into line with the uncoiler, said uncoiler being located between said supports during part of said movement, means for raising and lowering said coil supports to bring the axis of the coils supported thereon into line with the axis of the uncoiler, and means for causing relative transverse movement of the uncoiler and coil supports.

6. Apparatus for feeding coils of strip comprising an uncoiler for supporting a coil internally during initial uncoiling thereof, a movable carriage, a pair of spaced apart supports mounted on said carriage for rotatably supporting the coils on their outer surfaces, said coil being supported on one of said supports for uncoiling after the majority of the strip therein has been uncoiled, means for causing relative longitudinal reciprocating movement between the uncoiler and carriage to selectively move each of said supports into line with the uncoiler, said uncoiler being located between said supports during part of said movement, means for causing relative vertical movement of the uncoiler and coil supports to bring the axis of the coils supported thereon into line with the axis of the uncoiler, and means for moving said uncoiler to and from said coil supported on said supports.

7. Apparatus for feeding coils of strip comprising an uncoiler for supporting a coil internally during initial uncoiling thereof, a moveable carriage, a pair of spaced apart supports mounted on said carriage for rotatably supporting the coils on their outer surfaces, said coil being supported on one of said supports for uncoiling after the majority of the strip therein has been uncoiled, means for reciprocating the carriage longitudinally of the path of the strip to bring the supports selectively into line with the uncoiler, said uncoiler being located between said supports during part of said movement, means for causing relative vertical movement of the uncoiler and coil supports to bring the axis of the coils supported thereon into line with the axis of the uncoiler, and means for moving said uncoiler to and from said coils supported on said supports.

FREDERICK K. SCHEFE.

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