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COIL HANDLING APPARATUS

Filed Dec. 21, 1967

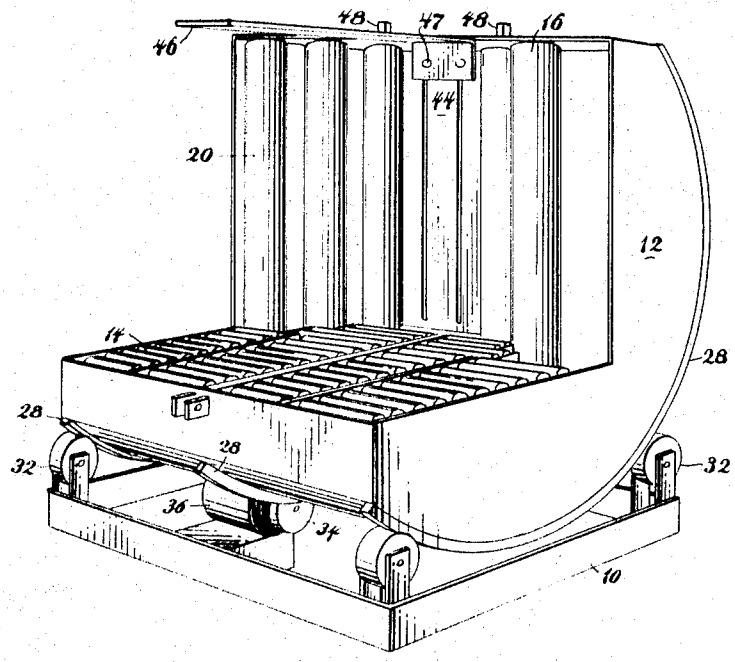


Fig. 1

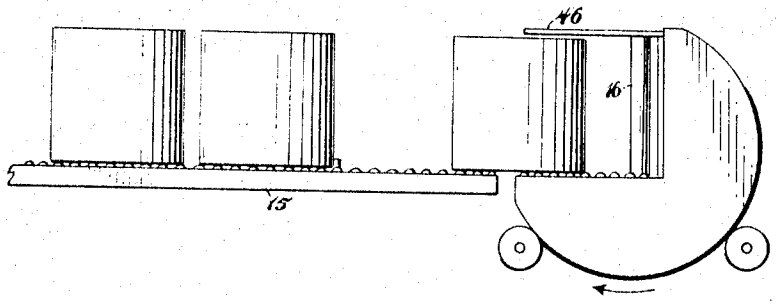


Fig. 2

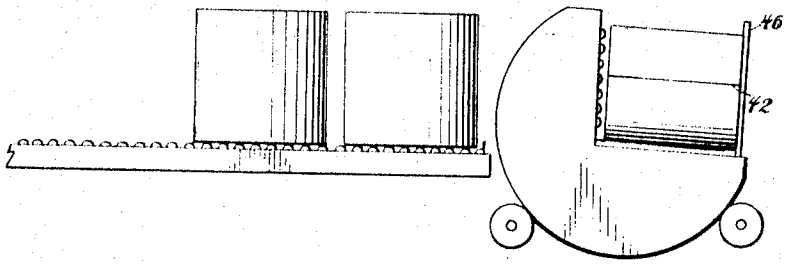


Fig. 3

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COIL HANDLING APPARATUS

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ABSTRACT OF THE DISCLOSURE

A device for handling heavy coils of metallic strip material on which the coils of strip material may be placed on one position, easily shifted to another position substantially normal thereto, and then unrolled therefrom with no intermediate handling to afford minimum handling before eventual use.

Background of the invention

Sheet steel, copper or other metallic materials are increasingly available to the user in small and easily handled coils or spools of material that as a rule vary from thirty to fifty inches wide. The coils of sheet material are rolled in a continuous length and they are commonly made to attain a diameter somewhat less than the width of the material, although they are in no way limited to such dimensions.

Such metallic coils are relatively easy to handle in comparison to un-rolled sheet material, however they still are understandably heavy and cumbersome and thus they present a problem in handling and uncoiling for eventual use.

A common expedient in the past has been to insert a crane-mounted rotary mandrel into the axial opening of a coil of material whereby it may be lifted, moved, and then uncoiled according to the demands. Although this method is reasonably effective, it is slow and dangerous and it requires the constant skilled services of several trained operators to properly move a coil of material from its source of supply to a point of use.

Summary of the invention

This invention is therefore directed to an apparatus of the type which is adapted to receive a heavy coil of material and move it into a position it may be readily uncoiled for use. Most important, a single, unskilled operator is sufficient to effectively operate the device, and if desired, it may be easily adapted for automatic operation.

Brief description of the drawing

A better understanding of the device may be obtained by reference to the accompanying drawings in which:

FIGURE 1 is a perspective view of the device of my invention in a "loading" position;

FIGURE 2 is a schematic drawing of the device in a "loading" position as it receives a roll of material from an inclined supply line; and

FIGURE 3 is a schematic drawing of the device as rotated 90° to an "unrolling" position for uncoiling the material strip.

Description of the preferred embodiments

In the drawings the device comprises a structually strong floor-mounted base **10** having an L-shaped platform **12** thereon rotatable about its horizontnal axis. The platform is arranged to include a series of bearing-mounted rollers **14** rotatively supported at their sides on the platform **12** to comprise a plane roller bed. A coil of sheet steel or other coiled material may be supplied thereto by an inclined feeder **15** in accordance with FIGURE

2 of the drawing, or it may otherwise be lifted and placed directly on the roller bed **14**.

Inasmuch as the bed comprises a series of freely moving rollers **14**, a coil of material supplied thereto may be easily moved over the upper plane of the rollers **14** against the vertical rollers **16** until stopped thereby. The rollers **16** similarly comprise a plurality of un-driven but freely rotating elongate rollers spaced apart and meeting the roller bed **14** along an essentially arcuate line forming the base of a curved surface substantially normal to the plane surface formed by the rollers **14**.

The L-shaped platform **12** is arcuately curved around its outer portion to provide a base for rotatable tracks **28** turning on means **32** and driven by the rotating mechanism **34** which is in turn actuated by the motor **36**. A motor **36** is preferably mounted on the base **10** and is actuated by means such as an automatic or manually operated controller not shown to rotate the platform an amount equal to about 90°.

The elongate rollers **16** are positioned in an essentially arcuate relationship to provide a broken, curved surface or "cradle" in which the coil of material may be carried. A force pulling on a loose end **42** of the material to unwind it from its coiled position will unwind the coil by freely rotating it upon the elongate rollers and in the "cradle" produced thereby. As the coil is unwound, it decreases in diameter and lowers itself onto an adjacent pair of rollers **16** having a lesser chordal dimension whereby it at all times effectively "cradled" between and contacted by at least a pair of spaced rollers.

The elongate rollers **16** may be positioned symmetrically with respect to the base **10**, however it is frequently deemed of adavntage to include a single additional roll **20** located above the plane of the other rolls, when positioned horizontally, against which a coil of material on the platform may be drawn to give additional support thereto as the coil itself becomes smaller and lighter during the unwinding operation.

The rollers **16** may be manually rotated by means of a cranking means **48** on the outboard ends of one or more of the rollers. By turning the rollers thus a roll of material cradled thereon may be rotated sufficiently to permit attaching a clamping means to its loose end **42** whereby it may be subsequently unrolled by simply drawing thereon as desired.

Payoff from a coil is usually, but not necessarily, from the bottom of the coil over the edge of the highest roller and into a subsequent crimper or other tool. The roll is unwound from its bottom so that the mass of the coil is utilized to hold the coil down in its cradle of rollers **16**.

The device is formed to include a slotted holder **44** for a material holding bracket **46** which is positioned above rollers **14** a distance somewhat greater than the width of a material roll being handled. Thus for a 40 inch roll, the bracket **46** might be positioned approximately 42 inches above the rollers **14**, while for a 36 inch roll, the bracket **46** might be moved to a position appproximately 38 inches above the roller bed. The bracket **46** is accordingly movably bolted at **47** or otherwise secured to the slotted holder **44** so that it may be easily moved along the slots **45** to accommodate various sizes of material coils.

When rotated to a position of operation such as shown by FIGURE 3 of the drawing, the apparatus is moved slightly past a horizontal position in order that the roll of metallic strip on the rollers **16** will slide away from the rollers **14** and not be contacted thereby in the un-rolling process. More important is the fact that the bracket **46** establishes an edge of the material as an exact guide edge or reference point for the placing of subsequent crimpers or the like.

In operation, heavy coils of strip material advance on

to the plane bed of the slightly inclined rollers **14** until stopped by the "cradle" or vertical surface provided by rollers **16** in the manner shown by FIGURE 2 of the drawing. Upon actuation of the motor **36**, the apparatus is then rotated in the direction of the arrow of FIGURE 2 until the coil is effectively turned on its side and supported in the "cradle" provided by the rollers **16**. The device is preferably rotated approximately 90° from its original position whereby the rolls **16** are slightly displaced from the horizontal sufficiently to cause a roll of strip thereon to lay against the bracket **46** and be thus spaced from the plane of the bed provided by the rollers **14**. The coil of material strip is then rotated by a manual cranking means **48** on rollers **16** sufficient to slightly unwind the coil and permit securing a clamping means to its loose end **42**. As the material strip of the coil is fed to subsequent crimpers or other processing apparatus, it is unwound from the coil without further handling by the rotation of the rollers **16** which comprise the "cradle."

While this invention has been described with reference to the embodiment illustrated in the drawing, it is evident that various changes may be made without departing from the spirit of the invention. It is accordingly intended that all matter contained in the accompanying drawings or described in the above description shall be interpreted as illustrative and not in a limiting sense.

I claim:

1. Material handling apparatus comprising a base, an L-shaped platform means on said base mounted for rotation about a fixed horizontal axis parallel with respect thereto, a plane surfaced roller bed on said platform, means rotating said platform about it s horizontal axis,

coil unrolling means on said platform comprising a plurality of elongate rollers disposed about a curved surface normal to said roller bed, each of said elongate rollers having an inboard bearing mounted adjacent the intersection of the legs of said platform whereby a coil of sheet steel placed on said roller bed may be rotated with said platform so as to support the coil on the unrolling means when the platform is rotated about its axis.

2. Apparatus as defined in claim **1** wherein the curved surface formed by said elongate rollers is asymmetric with respect to said base to assure support of the material coil thereby when the material is being withdrawn from the coil.

3. Apparatus as defined in claim **1** wherein the surface formed by said elongate rollers is curved to define an arcuate cradle for the support of said material coil.

4. Apparatus as defined in claim **1** including means for rotating the elongate rollers to in turn rotate the coil of material supported thereon.

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