

Oct. 14, 1969

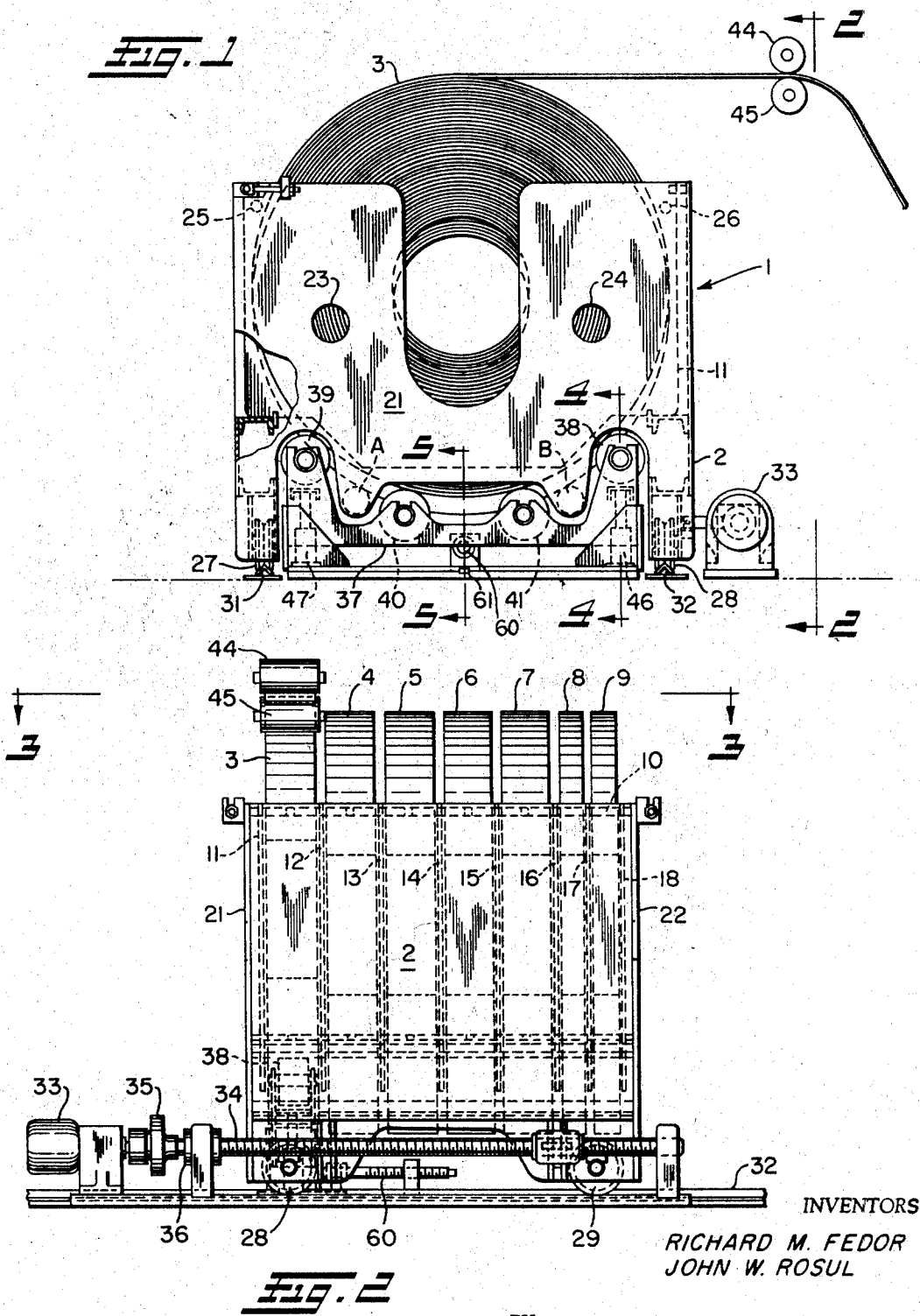
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3,472,463

CARTRIDGE UNIT FOR COILS

Filed Feb. 13, 1968

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

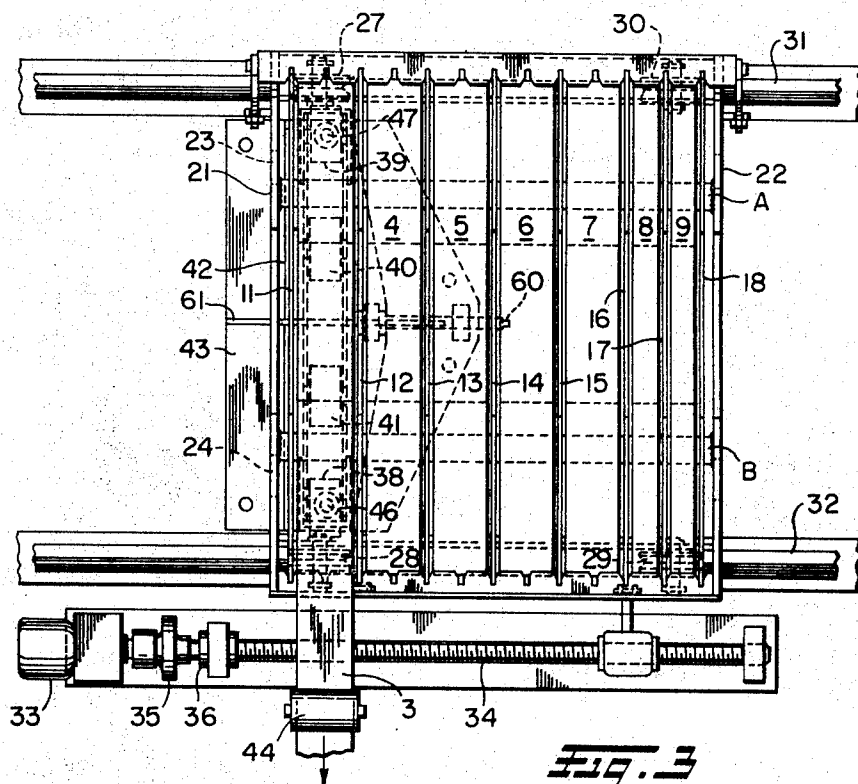


FIG. 3

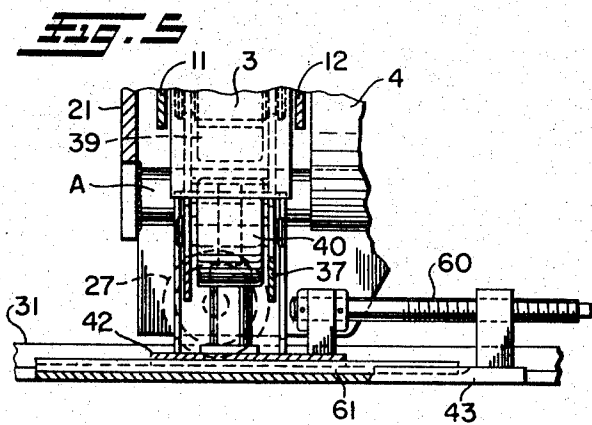


FIG. 5

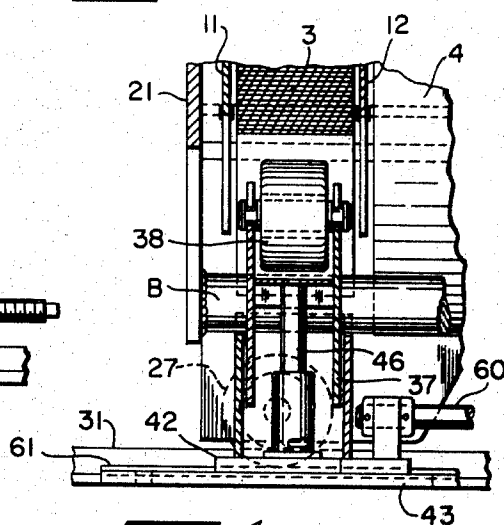


FIG. 4

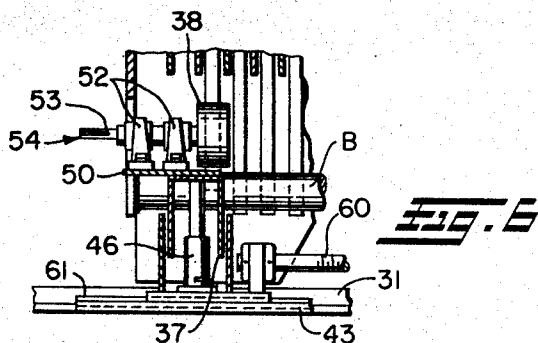


FIG. 6

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CARTRIDGE UNIT FOR COILS

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21 Claims

ABSTRACT OF THE DISCLOSURE

A cartridge unit for carrying and uncoiling metal strip stock in which a plurality of coils of such strip may be programmed and placed in a cartridge which is capable of retaining a plurality of such coils. The cartridge has means associated with it which raise, support and rotate one such coil while the remainder are in stand-by position. The cartridge unit is capable of movement to transport coils to a place of use.

This invention relates generally as indicated to a cartridge unit for coils and the like and more particularly to such a unit in which a plurality of coils can be programmed and placed to provide the necessary supply of strip stock, as for example to a metal working machine such as a stamping press, for a given job.

Strips of metal stock are commonly wound into compact coils as the strip issues from a rolling mill or other processing equipment to facilitate handling and shipping of the strip stock. Fabricators and other users of the coiled strip must provide their plants with apparatus to uncoil the strip, which has been received in coil form, any many plants have machines constructed and arranged for the automatic and continuous production of pressed or stamped products made from the strip stock as it is uncoiled and delivered to such machines. To permit a high rate of production by such machines, it is necessary to deliver a substantially continuous supply of uniform strip in accordance with the demand of the machine in which it is used.

To provide such supply of strip stock, various devices have been proposed to facilitate unwinding of the coiled strip. One such device is a dual or double reel mechanism capable of containing two coils of strip stock. The design of this device is such, however, that the two coils must be of substantially the same width and weight to balance the device, and this restricts the utility of the device in a very significant manner.

Another such device is illustrated and described in U.S. Patent 2,267,962 in which a plurality of coiled strips may be retained. Although such device may perform satisfactorily in some respects, it is not designed to be independently movable, which means that the individual coils of strip stock must be separately transported from the mill or warehouse and positioned in the coil holder at the job site. Additionally, such device is limited to a maximum of two coils and is not equipped with power take-off means which further restricts its utility.

It is a principal object of the present invention, therefore, to provide a cartridge unit in which a plurality of coils of strip stock can be retained and readily and easily unwound therefrom.

It is an additional object of this invention to provide a cartridge unit in which a plurality of coils of strip stock can be programmed and retained to provide the necessary supply of such material for any given job application.

An additional object of the present invention is the provision of a cartridge unit in which coils of strip stock can be placed as received at the rolling mill or warehouse and easily transported to a job site.

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Yet a further object of this invention is the provision of a cartridge unit in which coils of strip stock of varying widths can be positioned and programmed for a particular application.

Other objects, features and advantages of this invention will become apparent after a reading of the following more detailed description.

To the accomplishment of the foregoing and related ends, the invention, then, comprises the features hereinafter fully described and particularly pointed out in the claims, the following description and the annexed drawings setting forth in detail certain illustrative embodiments of the invention, these being indicative, however, of but a few of the various ways in which the principle of the invention may be employed.

In said annexed drawings:

FIG. 1 is an end view of the cartridge unit;

FIG. 2 is a side view of the cartridge unit taken on line 2—2 of FIG. 1;

FIG. 3 is a top view of the cartridge unit taken on line 3—3 of FIG. 2;

FIG. 4 is a fragmentary section view taken on line 4—4 of FIG. 1;

FIG. 5 is a fragmentary section view taken on line 5—5 of FIG. 1; and

FIG. 6 is a fragmentary section view illustrating a modified form of lifting mechanism.

Referring more particularly to FIGS. 1—3 of the drawings, the cartridge unit, designated generally by the numeral 1, comprises a cartridge or container 2 in which a plurality of coils of metal strip 3—9 may be positioned and retained. It will, of course, be appreciated that the cartridge may accommodate a greater or lesser number of coils as is necessary for any particular application.

The coils are separated from one another within the cartridge by spacer bar 10, which preferably can be removed from the cartridge and replaced by a bar having a different set of spacings, as will be necessary in applications where strips of different widths are needed. A plurality of vertically extending plates 11—18 are secured within the spacer bar and extend vertically therefrom. The cartridge also preferably includes end plates 21 and 22 which assist in retaining the coils therein. As shown most clearly in FIG. 1, the end plates preferably have holes 23 and 24 therein to facilitate lifting and removal from the cartridge when coils are being loaded. The spacer plates also have holes 25 and 26 therein to facilitate removal of the same from the cartridge when necessary to accommodate coils of different widths.

The cartridge is mounted on wheels 27, 28, 29 and 30 to provide for independent movement of the car from a mill or warehouse to a job site after the coils have been positioned therein. The wheels may all be notched as illustrated to ride on rails 31 and 32, or, if desired, the wheels on one side of the cartridge can be flat. To provide for the necessary movement of the cartridge to align the coils therein with the lifting means, a gear motor 33 is connected to the cartridge through drivescrew 34, clutch 35 and rotating lock collar 36.

The cartridge has a driven assembly 37 associated with it comprising main drive rollers 38 and 39, which are adapted to support and rotate a single coil of strip, and support rollers 40 and 41 which help support the underside of the coil and compensate for changes in the outside diameter of the coil as it is unwound. The drive assembly includes a bottom plate 42 and is positioned on foundation 43. The drive and support rollers are driven through a conventional motor arrangement (not shown), which preferably is a variable drive motor. Pinch rolls 44 and 45 are also associated with the cartridge to facilitate unwinding of the coil and are preferably synchronized

with the drive motor. The cartridge also includes fixed rods A and B to support the stand-by coils.

The lifting mechanism, which is also associated with the cartridge, raises a single coil to a position above the other coils in the cartridge, as shown most clearly in FIG. 2, to facilitate unwinding of the coil. The lifting means comprises hydraulic jacks 46 and 47 which are in cooperative relationship with the drive assembly 37 and particularly rollers 38 and 39. To lift the coil, the jacks are operated, either manually or mechanically in conventional manner, which raises the entire drive assembly 37 through contact between jacks 46 and 47 and rollers 38 and 39. Although the lifting means is described and illustrated as of the hydraulic type, it will be appreciated that other suitable devices may be used if desired.

In the embodiment illustrated in FIG. 4, the roller 38 is mounted on the drive assembly directly above hydraulic jack 46 (as are roller 39 and jack 47) and supports the coil from the underside thereof. Alternatively, the lifting mechanism may be of the type illustrated in FIG. 6 in which a platform 50 is positioned directly above the hydraulic jack and roller 38 is supported thereon by a plurality of bearing blocks 52. Shaft 53 has a keyway 54 therein through which the roller is driven. The embodiment of FIG. 6 is especially advantageous in that very narrow widths of coil can be handled since the rotating roller can be positioned very close to a non-rotating stand-by coil without contacting the same.

As shown in FIGS. 1 and 5, the cartridge also includes means to provide for relatively fine lateral adjustment of the drive assembly to compensate for coils of different widths. Such means includes a drivescrew 60 which has one end mounted on bottom plate 42 of the drive assembly and is connected thereto through keyway 61. By turning the drivescrew, the drive assembly can be moved laterally in either direction to compensate as necessary for differences in widths of the succeeding coils in the cartridge.

It will be appreciated from the foregoing that the use of the cartridge unit of this invention eliminates the need for storage or separate transportation of coiled strip from a mill or the like since the coils can be placed directly into the cartridge and transported to the job site therein. Similarly, the present invention makes it possible to load all of the coils necessary for a particular job in the cartridge in a programmed manner, that is, arranged according to the width of strip in the sequence needed, thus providing for a substantially continuous supply of strip. Also, because of the construction of the cartridge, it is possible to load or unload coils while uncoiling and feeding of the strip continues. Although the invention has been described for use with metal strip, it will be understood that it can also advantageously be used with coils of other material as, for example, wire or rod, paper, plastic, etc.

Other modes of applying the principle of the invention may be employed, change being made as regards the details described, provided the features stated in any of the following claims, or the equivalent of such, be employed.

We therefore particularly point out and distinctly claim as our invention:

1. A cartridge unit for coils comprising a cartridge capable of retaining a plurality of coils of strip stock therein, means associated with said cartridge adapted to support and rotate a coil of such stock, and means associated with said cartridge to lift a coil of strip while on said support means to a position above the other coils in said cartridge to facilitate unwinding of such coil.

2. The cartridge unit of claim 1 including means in said cartridge to separate such coils from one another across the width thereof.

3. The cartridge unit of claim 2 in which said means to separate such coils comprises a removable spacer bar extending across the width of said cartridge and a plu-

ality of vertically extending plates extending from said bar.

4. The cartridge unit of claim 1 including means associated with said cartridge to move said cartridge transversely with respect to said lift means, whereby coils spaced across the width of said cartridge may be aligned with said lift means and raised to a position for unwinding.

5. The cartridge unit of claim 1 in which said means to support and rotate such coil comprises a plurality of rollers, and said lift means comprises a hydraulic jack and one of said rollers associated with said jack to support the underside of said coil.

6. The cartridge unit of claim 5 in which said roller associated with said jack is positioned directly above said jack.

7. The cartridge unit of claim 5 in which a platform is positioned directly above said jack and said roller associated with said jack is supported on said platform by a plurality of bearing blocks.

8. The cartridge unit of claim 1 including pinch rolls associated with said cartridge to facilitate unwinding of such coils.

9. A cartridge unit for coils comprising a cartridge capable of retaining a plurality of coils of strip stock therein, drive means associated with said cartridge adapted to support and rotate a coil of such stock, lift means associated with said cartridge to lift a coil of strip to a position above other coils in said cartridge to facilitate unwinding of such coil, means associated with said cartridge to move said cartridge transversely with respect to said lift means, said drive means comprising a plurality of rollers, and said lift means comprising a hydraulic jack and one of said rollers associated with said jack to support the underside of such coil.

10. The cartridge unit of claim 9 including means in said cartridge to separate such coils from one another across the width thereof comprising a removable spacer bar extending across the width of said cartridge and a plurality of vertically extending plates extending from said bar.

11. The cartridge unit of claim 9 in which said roller associated with said jack is positioned directly above said jack.

12. The cartridge unit of claim 9 in which a platform is mounted on said drive means directly above said jack and said roller associated with said jack is supported on said platform by a plurality of bearing blocks.

13. The cartridge unit of claim 9 in which said means to move said cartridge comprises movable wheels on the underside thereof and a drivescrew connected to said cartridge.

14. A cartridge unit for coils comprising a cartridge capable of retaining a plurality of coils of strip stock therein, a plurality of coils of strip stock positioned in said cartridge, means on said cartridge separating said coils from one another across the width of said cartridge, drive means associated with said cartridge adapted to support and rotate a coil, and means associated with said cartridge to lift one of said coils while thus supported to a position above the other said coils in said cartridge to facilitate unwinding of said coil.

15. The cartridge unit of claim 14 in which said separation means comprises a removable spacer bar extending across the width of said cartridge and a plurality of vertically extending plates extending from said bar.

16. The cartridge unit of claim 14 including means associated with said cartridge to move said cartridge transversely with respect to said lift means whereby said coils spaced across the width of said cartridge may be aligned with said lift means and raised to a position for unwinding.

17. The cartridge unit of claim 14 in which said drive means comprises a plurality of rollers, and said lift means comprises a hydraulic jack and one of said rollers asso-

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ciated with said jack to support the underside of one of said coils, the width of said one roller being sufficient to support the widest of said coils in said cartridge.

18. The cartridge unit of claim 17 in which said roller associated with said jack is positioned directly above said jack.

19. The cartridge unit of claim 17 in which a platform is mounted on said drive means directly above said jack and said roller associated with said jack is supported on said platform by a plurality of bearing blocks.

20. A process for supplying metal strip stock to a metal working machine comprising programming a plurality of coils of such strip stock for such application, placing such programmed coils in a cartridge capable of retaining a plurality of coils of such strip stock therein, lifting the first of such coils of strip stock to a position above the other coils in said cartridge, unwinding such

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coil and supplying such strip stock to such metal working machine.

21. The process of claim 20 including the further steps of moving such cartridge to align the next of such coils of strip material with lift means, lifting such coil to a position above the other coils, and unwinding and supplying such strip stock to such metal working machine.

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