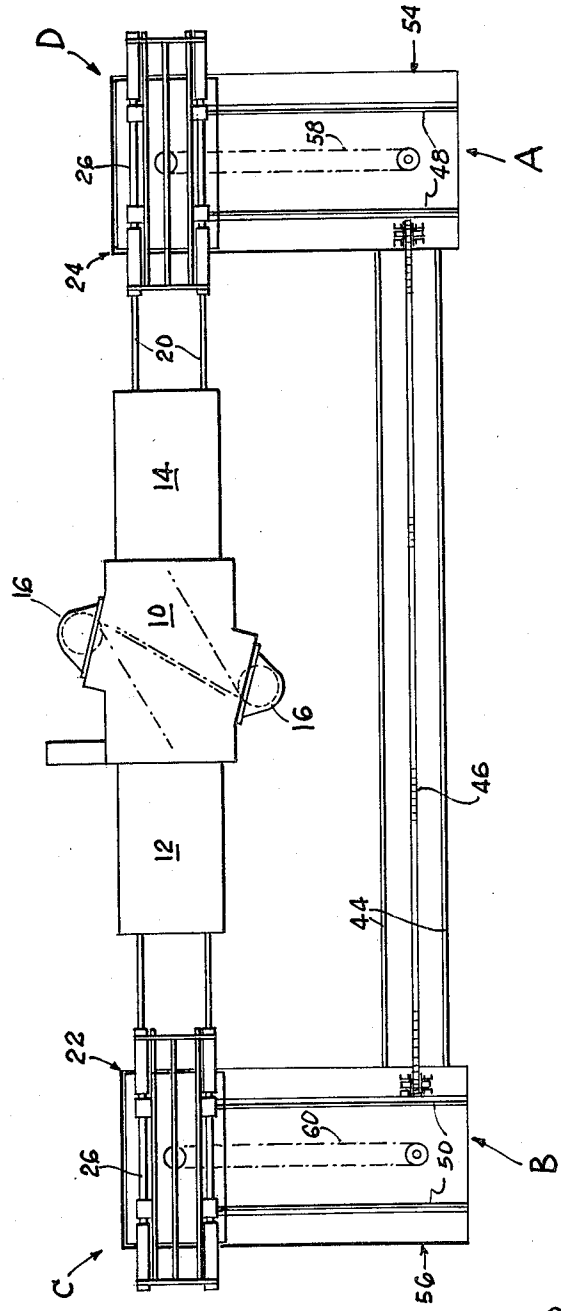
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APPARATUS FOR SURFACE TREATMENT OF METAL COILS

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FIG. 1



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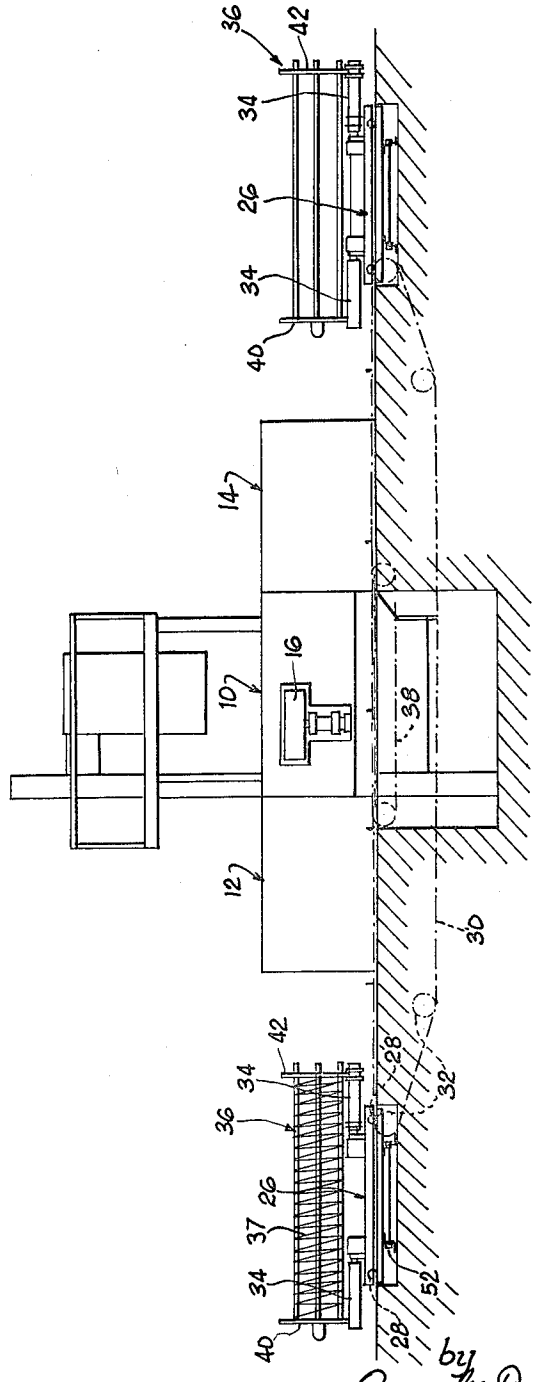
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FIG. 2



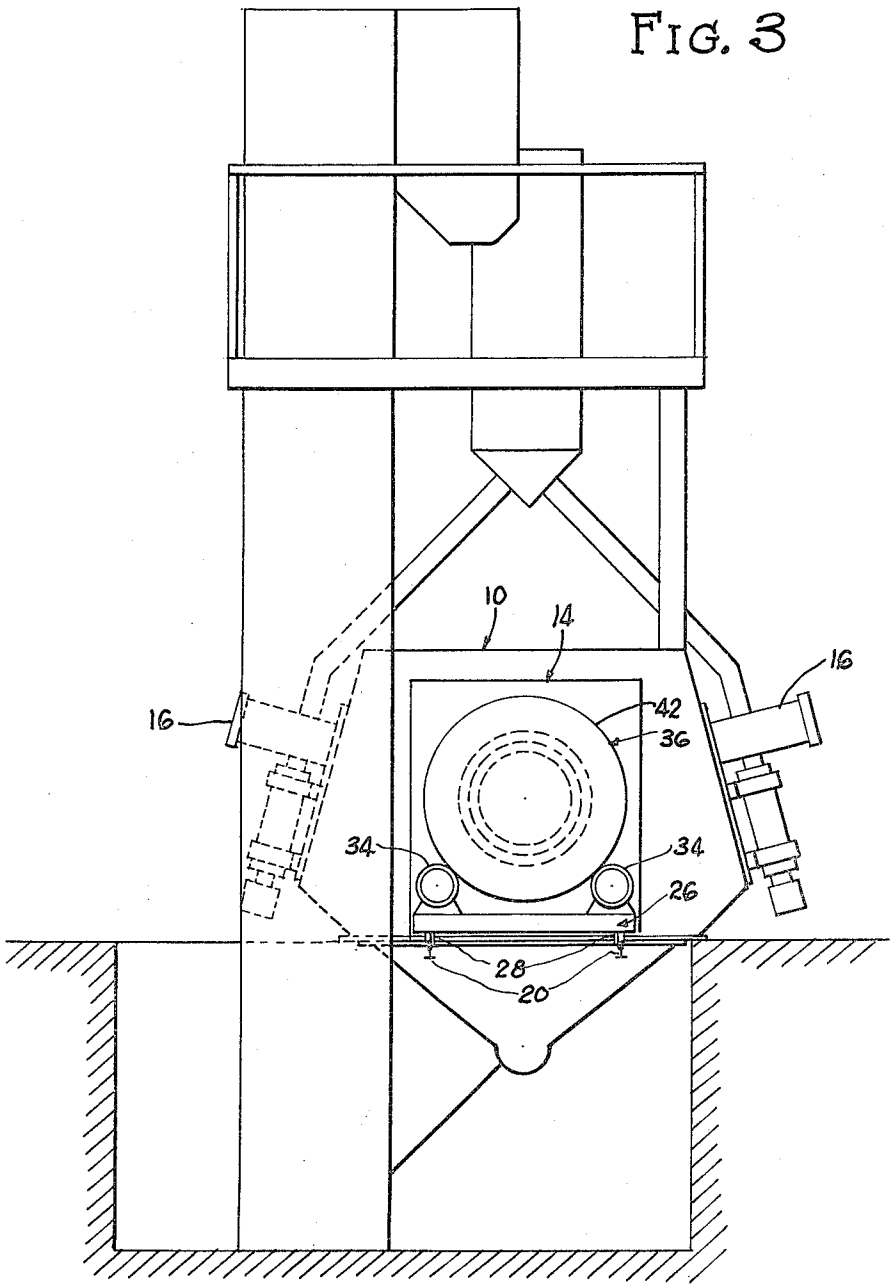
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APPARATUS FOR SURFACE TREATMENT OF METAL COILS

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FIG. 3



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APPARATUS FOR SURFACE TREATMENT OF METAL COILS

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Claims priority, application Switzerland Oct. 26, 1961
10 Claims. (Cl. 51—15)

This invention relates to the surface treatment of bundles of metal wire or strip and it relates more particularly to a means for cleaning or otherwise treating the surfaces of metal wire in a bundle with dry particulate material which may be applied by throwing the particles onto the exposed surfaces of the wire.

In my copending application filed concurrently herewith and entitled "Method and Device for Loading Wire Coils on a Frame," description is made of a method and means of opening a bundle of wire for fuller exposure of the surfaces to the centrifugally thrown particles of cleaning material or other surface treating material. This invention is addressed to the subsequent handling of an open bundle in the treatment of the surfaces of the metal for complete coverage of the surface.

In the past, endless lengths of wire or strap have been surface treated by uncoiling the wire or strip from the bundle and then recoiling the wire or strip after having been exposed to the treating material as by centrifugally throwing the material or composition onto the surface. The described process is subject to a number of objections such as the additional amounts of equipment, labor and time required for uncoiling and coiling the wire for full exposure of the surfaces as a single strand of wire. Further, it is difficult to make use of the described process on stiff material.

It is an object of this invention to produce a means for the efficient and effective treatment of bundles of wire, or ribbons, or strip metal products whereby the surfaces of the material to be treated are substantially completely exposed to the treating material.

More particularly, it is an object of this invention to provide a new and improved means for treating open coils of metal wire or strip at a fixed treating zone with means for movement of the spread coils for fuller exposure of the surfaces of the metal to the treating material.

These and other objects and advantages of this invention will hereinafter appear and for purposes of illustration, but not of limitation, an embodiment of the invention is shown in the accompanying drawings, in which—

FIG. 1 is a plan view of the arrangement of elements embodied in the features of this invention for use in treating coils of metal wire or strip by centrifugal or jet means.

FIG. 2 is a side elevational view of the installation shown in FIG. 1; and

FIG. 3 is an end view of the equipment shown in FIG. 1.

The concepts of this invention reside in an installation which consists of the combination of a treating section embodying centrifugal or jet means for application of the surface treating material such as a dry particulate, abrasive particles, a guide track passing through the treating section, at least one conveyance means shiftable over the guide track into and out of the treating section, means forming a part of said conveyance means for receiving a frame about which the coils of wire are spread, and means for effecting rotational movement of said frame relative to the conveyor while the conveyor is in the treating section to provide for fuller exposure of the wire surfaces to the centrifugally thrown treating material.

Referring now to the drawings, the treating station

comprises a housing 10 having a sealed inlet plenum chamber 12 in endwise alignment and in communication with the inlet end of the housing 10, and a sealed outlet plenum chamber 14 in endwise alignment and in communication with the outlet end of the housing 10. A pair of centrifugal throwing wheels 16 are located in the opposite side walls of the housing.

In the illustrated modification, and particularly with reference to FIGS. 2 and 3, it will be seen that the centrifugal throwing wheels 16 are mounted for rotational movement about a substantially vertical axis with the particles or other material issuing from the preferably oppositely disposed wheels in a direction inwardly in approximate opposite directions, with the pattern of the centrifugally thrown particles being offset slightly angularly for more complete coverage of the treating zone, as more clearly illustrated in FIG. 3. It will be understood that more than two centrifugal or blasting wheels can be employed and, instead of transversal radiation, longitudinal radiation of the wires is likewise possible.

A pair of laterally spaced apart parallel guide tracks 20 extend linearly from a loading station 22 to an undoading station 24 through the aligned inlet plenum chamber 12, housing 10 and outlet plenum chamber 14. Carrier cars 26 are provided with wheels 28, shoes or other means operable on said tracks 20 for movement linearly over the guide tracks responsive to actuation by suitable driving means, such for example as the endless driving chain 30 operable over guide rollers 32 and adapted to be displaced linearly by suitable power operating means of conventional construction (not shown). Each car 26 is provided with longitudinally spaced apart pairs of crosswise spaced tubular rollers 34 between which the drums 36 are adapted to be supported for rotational movement of the horizontally disposed drums about their axis when the cars are displaced through the housing. For this purpose, separate drive means are provided for actuation of the rollers for rotational movement during passage of the carriers through the housing. In the illustrated modification, such means comprises an endless driving chain 38 extending through the housing alongside of the tracks 20 with conventional means adapted operatively to be engaged by said chain for transmission of force for rotational movement of the rollers 34 during passage of the carrier through the housing. Instead, the rollers 34 can be actuated for rotational movement about their horizontally disposed longitudinal axis responsive to movement of the carriers by the endless chain 30 or other suitable power means, such as an electrical driving motor, may be operatively connected to said rollers for providing the desired independent rotational movement.

The frames 36 adapted to be mounted on the rollers 34 are provided with carrier rings 40 and 42 at the opposite end portions with the open frame member in between. The coils of the wire bundle 37 are adapted to be spread over the frame members for spacing the coils to provide access to the interior as well as other surfaces of the metal wire. The ring members 40 and 42 at each end are adapted to ride on the peripheral surfaces of the spaced rollers 34 in a manner to support the frame 36 in spaced relation with the supporting rollers and carrier. It is preferred to dimension the ring members 40 and 42 on at least one end of the frame to correspond with the dimensions of the access openings through the chambers 10, 12 or 14 to effect a sealing relationship while the carrier supported drums pass therethrough between the centrifugal throwing wheels.

Another pair of guide tracks 44 are provided in spaced parallel relation with the guide tracks 20 and with means, such as an endless chain 46, for actuating the carriers thereover. At the opposite ends of the tracks 20 and 44 there are provided pairs of crosswise extending tracks 48

and 50 over which the carriers may be transported from one guide track 20 or 44 to the other pair of guide tracks 20 or 44. For this purpose, the carriers are provided with rollers, shoes or other track engaging means 52 spaced longitudinally by an amount corresponding to the spaced relationship between the tracks 48 or 50 for enabling the rollers to enable said means to ride over the tracks during transportation of the carriers crosswise thereover. Each transverse carrier station 54 and 56 is provided with an endless driving chain 58 and 60 respectively, adapted operatively to engage said carriers for displacement of the carriers from one side to the other. Suitable power operating means may be employed for effecting the desired linear displacement of the driving chain.

Instead of endless chains 30, 38, 58 and 60, for actuation of the carriers, use can be made of other means for driving the carriers, such as self-contained driving motor means, hydraulic actuation means and the like.

The following will illustrate the operation of the elements employed in the described installation:

Starting with the carrier in position A at the delivery end of the guide track 48, conventional means, such as cranes, hoists or the like, are provided for placement of the drum or drums onto the rollers 34 of the carrier with the wire coils already spread over the frame members. From position A, the carrier is displaced over track 44 by means of the driving chain 46 from station A to station B with the cross rollers 52 in alignment with the cross guide rails 50. The carrier is then displaced crosswise over the pair of guide rails 50, as by the driving chain 60, from position B to position C in endwise alignment with the track 20 leading into and through the treating section of the housing. At station C, the driving chain 30 picks up the carrier for displacement linearly over the guide tracks 20 through the inlet plenum chamber 12, the housing 10 and through the outlet plenum chamber 14 to the station D.

During passage through the housing, the rollers 34, on which the rings 40 and 42 of the drum 36 are supported, are rotated about their horizontally displaced longitudinal axes to effect rotational movement of the drum or drums about their horizontal axes during which time the centrifugal throwing wheels are operated to throw the abrasive or other surface treating material onto the exposed surfaces of the wire wound about the rotating drum. When the carriers reach station D, the drums are unloaded from the carrier after which the freed carrier is displaced crosswise by the driving chain 58 from station D to the starting position at station A.

The loading and unloading of the transport cars or carriers can also be adapted to take place at a station other than the one mentioned in the foregoing example.

It will be apparent that the entire transportation cycle and treatment can be effected by automatic remote control wherein the connection and disconnection between the transport carriers and their respective actuating or driving chains can be effected by clutch means (not shown) which are operable by remote control or in response to movement of the carriers to a predetermined position.

It will be apparent from the foregoing that I have provided a simple and efficient means for effecting surface treatment of coils of wire making up a bundle whereby substantially the entire surfaces of the wire are exposed for such surface treatment. It will be evident further that the system described provides for substantially continuous operation in a simple and efficient manner which makes use of a minimum amount of labor and space thereby materially to reduce the cost of processing while at the same time improving the effectiveness of surface treatment.

It will be understood that changes may be made in the details of construction, arrangement and operation without

departing from the spirit of the invention, especially as defined in the following claims.

I claim:

1. A means for treatment of metal coils comprising a housing, means within said housing for throwing treating material onto work passing through said housing, a guide track extending lengthwise through said housing from an inlet at one end to an outlet at another, a conveyance means mounted for movement on said guide track through said housing from the inlet end to the outlet end, a cylindrical frame adapted to carry said coils in spiral, spread-apart relationship, means mounting the frame on said conveyance means, means for displacement of the conveyance means through said housing, and means for imparting rotational movement to said frame relative to said supporting conveyance means during passage of the conveyance means from the inlet end to the outlet end of said housing.

2. A means as claimed in claim 1 in which the metal coils comprise wire coils spread on said frame to provide a spaced relationship between said coils for greater access to the surfaces thereof for treatment with the surface treating material.

3. A means as claimed in claim 1 in which the treating material is thrown into said housing by centrifugal throwing wheels mounted for rotational movement about a vertical access.

4. A means as claimed in claim 3 in which the centrifugally throwing wheels are mounted in the side walls of the housing and positioned to throw the material inwardly into the interior of the housing.

5. A means as claimed in claim 4 in which the centrifugal wheels are aimed so that the patterns of material thrown by the wheels are offset angularly one from the other for more complete coverage of the treatment area within the housing.

6. A means as claimed in claim 1 in which the frame comprises a horizontally disposed frame with disc members at each end dimensioned to correspond to the inlet and outlet to the housing to effect a sealed relationship therebetween during passage of the conveyance means and frame through said housing.

7. A means as claimed in claim 1 in which the guide track extends continuously through said housing from a starting position in advance of the inlet to an ending position beyond the outlet of the housing and which includes guide tracks extending horizontally at right angles in spaced parallel relationship from the starting and ending positions, another pair of guide tracks in spaced parallel relation with the guide tracks through the housing and extending horizontally lengthwise between the pair of perpendicular guide tracks for travel of the conveyance means in a continuous path in sequence from starting position to ending position, crosswise from ending position on one of said pair of perpendicular guide tracks to the corresponding end of the parallel side tracks across the parallel side tracks to the corresponding end of the other of the perpendicular guide tracks and over said other perpendicular guide tracks to starting position.

8. A means as claimed in claim 7 which includes means for unloading the frame from the conveyance means at one of the positions including the ending position and the end of the guide track which extends perpendicularly therefrom.

9. A means for the surface treatment of metal coils with abrasive cleaning particles comprising a housing, means within said housing for throwing said particles onto work passing through said housing, a guide track extending lengthwise through said housing from an inlet at one end to an outlet at another, a conveyance means mounted for movement on said track through said housing from the inlet end to the outlet end, said conveyance means comprising a frame having wheels mounted for rotational movement on the track and laterally spaced-apart rollers on the top side thereof, a cylindrical frame adapted to

carry said coils in spiral, spread-apart relationship, said cylindrical frame being adapted to be mounted on said conveyance means, means for imparting rotational movement to said rollers whereby rotation of the cylindrical frame can be effected, means for displacement of the conveyance means through said housing, said means for effecting rotation of said frame being operated during movement of said frame through said housing.

10. A means as claimed in claim 9 wherein the means for displacing the conveyance means over said guide tracks comprises an endless chain.

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