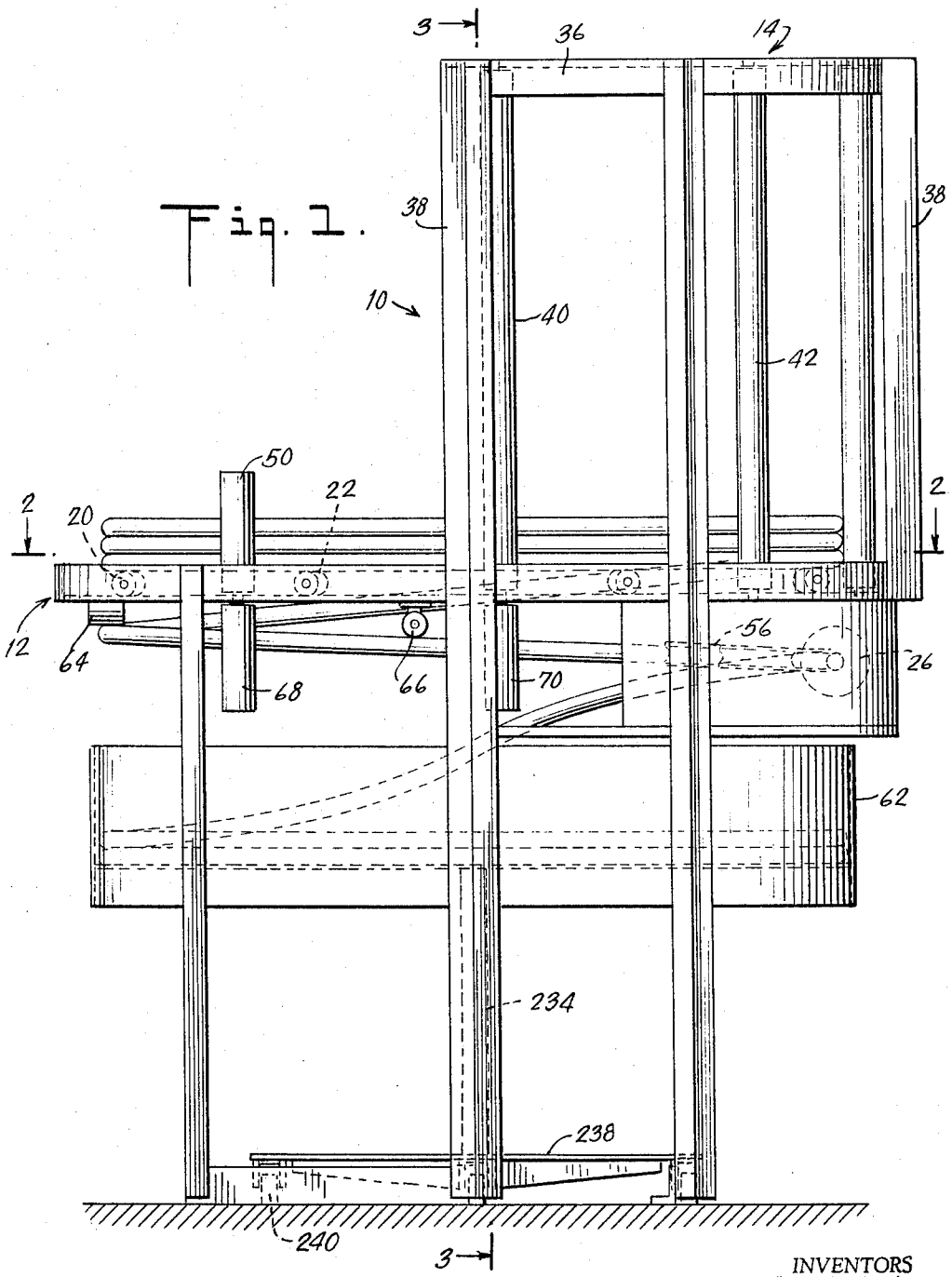
Oct. 11, 1966 L. P. DE VAU ETAL 3,278,330

METHOD AND APPARATUS FOR COATING AN ELONGATED ARTICLE IN COIL FORM

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Fig. 1.



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METHOD AND APPARATUS FOR COATING AN ELONGATED ARTICLE IN COIL FORM

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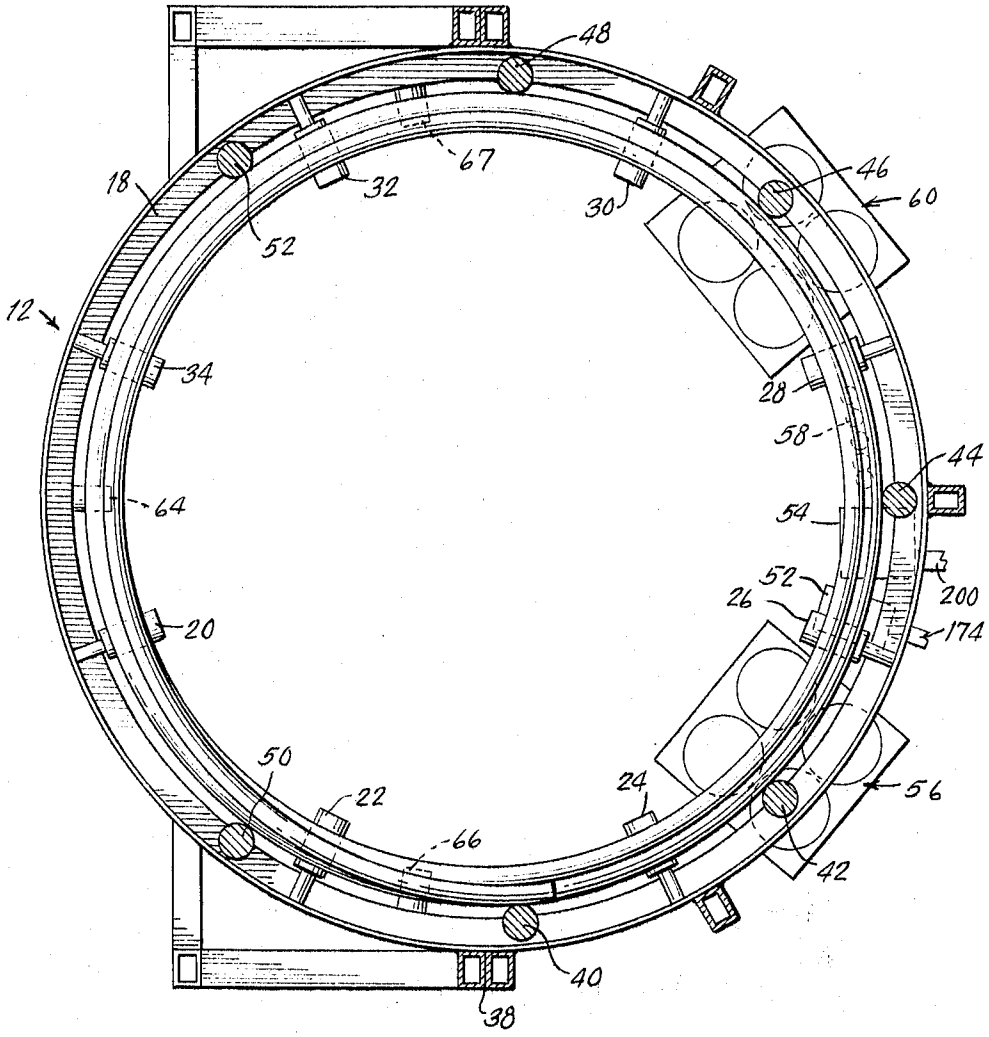


Fig. 2.

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METHOD AND APPARATUS FOR COATING AN ELONGATED ARTICLE IN COIL FORM

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Fig. 3.

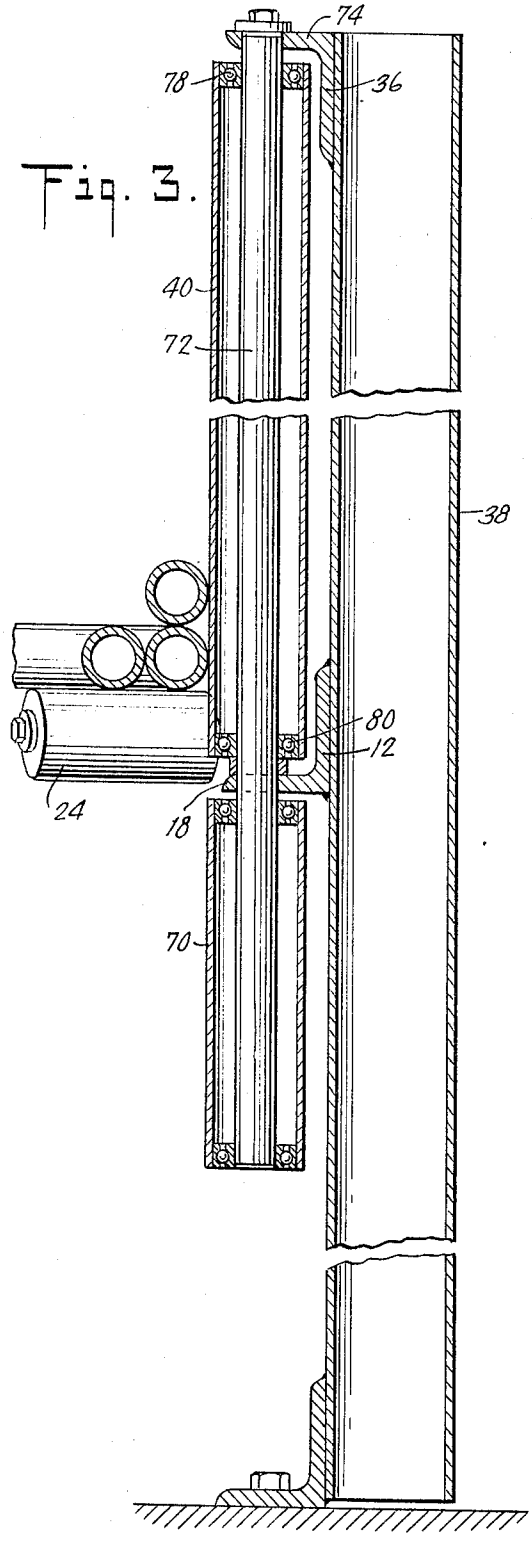
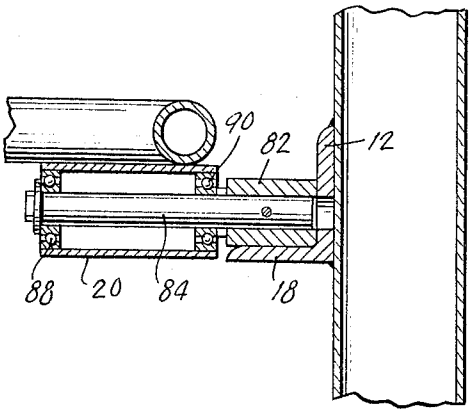


Fig. 4.



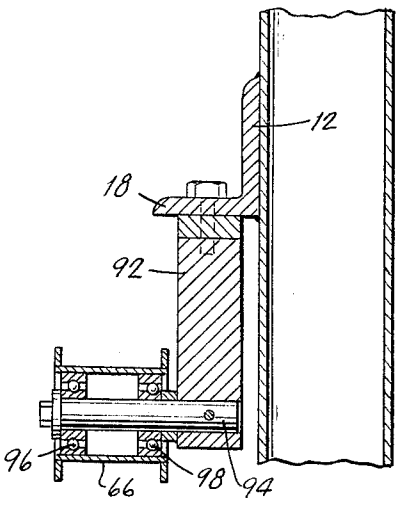


Fig. 5.

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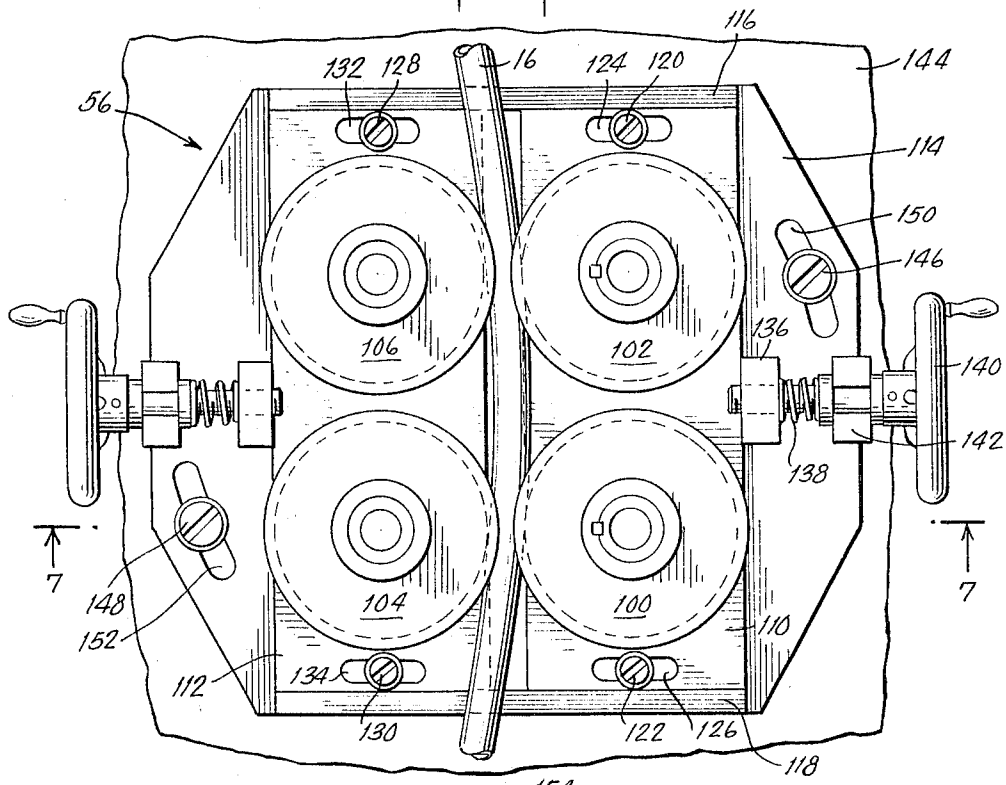
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Oct. 11, 1966 L. P. DE VAU ETAL 3,278,330

METHOD AND APPARATUS FOR COATING AN ELONGATED ARTICLE IN COIL FORM

Filed April 29, 1963 5 Sheets-Sheet 4

Fig. 6.



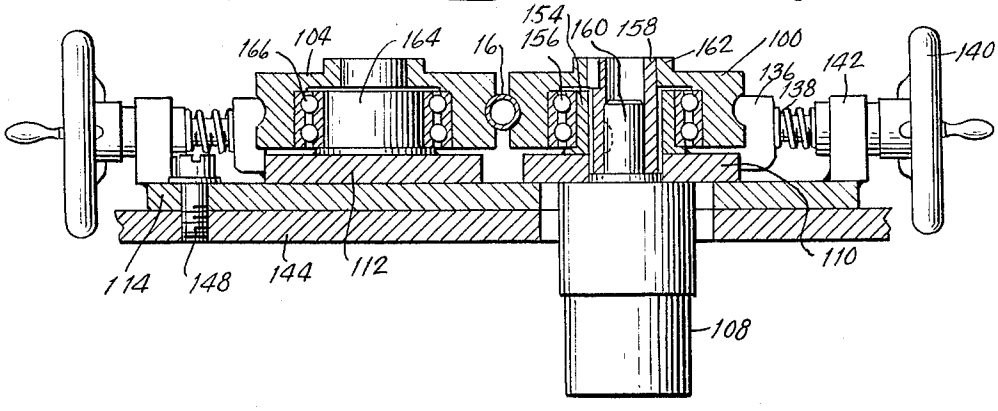


Fig. 7.

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METHOD AND APPARATUS FOR COATING AN ELONGATED ARTICLE IN COIL FORM
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Fig. 8.

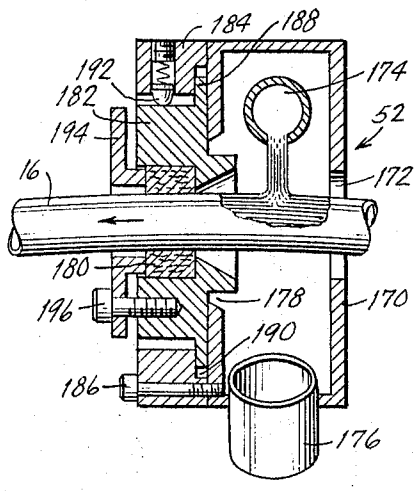
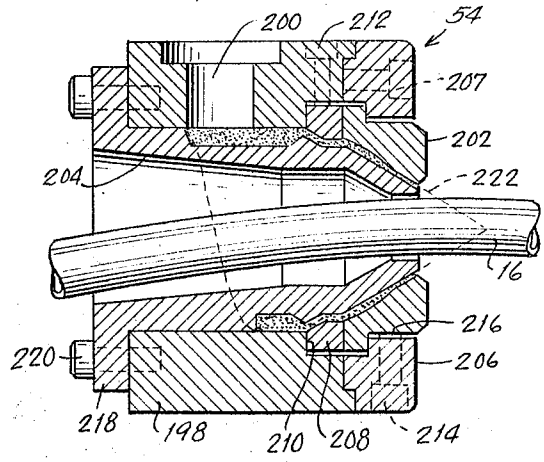


Fig. 9.



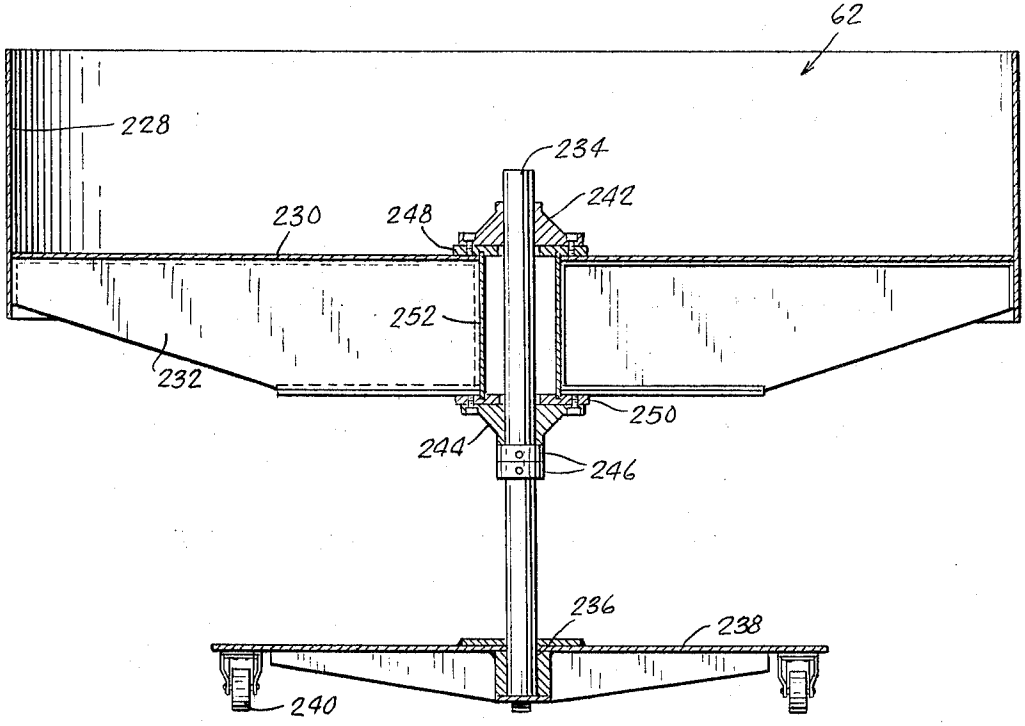


Fig. 10.

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United States Patent Office 3,278,330 Patented Oct. 11, 1966

3,278,330

METHOD AND APPARATUS FOR COATING AN ELONGATED ARTICLE IN COIL FORM

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Filed Apr. 29, 1963, Ser. No. 276,355
15 Claims. (Cl. 117—94)

This invention relates to a method for applying a plastic coating to tubing, rod, wire, or the like, in coiled form and to apparatus for continuously feeding tubing, rod, wire, or the like, while a plastic coating is being externally applied to a continuously moving length thereof. The invention is particularly described in connection with a method and apparatus for applying coating to a continuous length of tubing in coiled form.

During recent years there has been a substantial demand for plastic coated metal tubing. This demand has not been met in an economical manner because the tube coating devices and methods heretofore known have been limited to the coating of individual, straight tubes of limited length. The obvious disadvantage inherent in the coating of straight lengths of tubing arises from the practical difficulty that only relatively short lengths of tubing can be so coated.

Tubing and the like is most easily and economically handled in coils, frequently containing in excess of 1000 feet of tubing. It is conceived that a great saving in time and labor cost can be effected by resort to a continuous coating operation in which the coating is applied while the tubing is maintained in the form of a coil.

It might be suggested that tubing in coiled form be first straightened, the plastic coating applied to the straightened length of tubing and the coated tubing be then recoiled. A procedure involving the uncoiling and recoiling of tubing also has obvious disadvantages. Foremost is the time, space and equipment required. Furthermore, certain tubing when so manipulated may be work hardened to an undesirable extent. Finally, the coating of tubing in coiled form involves the least danger of damage of any kind to the coating or coating applied thereto.

It is, therefore, a specific purpose of the invention to provide a tube coating method which involves rotatably supporting a coil of tubing, separating a turn of the tubing from a coil thereof only in a direction axial of the coil, passing the axially separated tubing into and through a plastic applying zone while continuously rotating the coil on its axis, applying a coating to the tubing as it emerges from the plastic applying zone, guiding the plastic coated tubing into an arcuate path to maintain its coiled form as it emerges from the plastic applying zone, and rotating the coiled coated tubing continuously on the axis of the coil throughout the operation.

It is a specific object of the invention to provide a coil feeding apparatus adapted to support, feed and control a coil of tubing wherein the coil is bodily rotated while one or more turns of the coil are separated and processed while in motion without changing the circular form of the coil.

It is a particular object of the invention to provide a coil feeding apparatus adapted to support, feed and control a coil of tubing while the latter is being coated with a plastic coating composition as it passes through a coating die.

It is a further object of the invention to provide tube coating apparatus adapted to support, guide and feed tubing from a coil thereof while performing a processing operation on a length of the moving tubing, and withal control the movement of the tubing in a manner to

maintan the same in coiled form while the processing operation is being performed.

To the end that the objects and purposes of the invention may be carried out, the coil feeding apparatus herein provides a coil support permitting large coils of tubing to turn bodily about the coil axis with great freedom while one or more turns of the coil are separated into an adjacent plane for processing in combination with means for guiding and receiving coated tubing in coiled form.

In its more specific aspect the coil apparatus herein provides anti-friction coil supporting means disposed both radially and axially of the coil, whereby the coil is restrained to the apparatus but is entirely free to turn with ease about its axis.

Further objects and advantages of the invention together with the arrangements of parts and their functions, will become clear as the specification is read in light of the drawings, in which drawings like reference numerals indicate like parts, and in which:

FIG. 1 is a side elevational view of the coil feeding apparatus with which this invention is concerned;

FIG. 2 is a plan view partially in section, taken on line 2—2 of FIG. 1;

FIG. 3 is a vertical sectional view taken on line 3—3 of FIG. 2;

FIG. 4 is a sectional detail of one of several radial coil-supporting stub rollers in the stand;

FIG. 5 is a detail sectional view representative of several flanged tube guide rollers embodied in the machine;

FIG. 6 is a plan view of tube feeding mechanism embodied in the stand;

FIG. 7 is a vertical view, partially in section, taken on line 7—7 of FIG. 6;

FIG. 8 is a vertical sectional view of an undercoating applicator embodied in the apparatus;

FIG. 9 is a vertical sectional view of an extrusion die assembly embodied in the stand; and

FIG. 10 is a vertical sectional view through a coil-receiving drum.

In its essence, the coil feeding apparatus herein provides an anti-friction coil cradle **10** which is so constructed and arranged as to support coiled tubing, rod, or wire on anti-friction members such that the coil is free to turn. The coil cradle **10** is composed of a coil-supporting bed **12** and a semi-circular cage **14**. The coil-supporting bed **12** is shown in FIG. 1 as being disposed horizontally to receive a coil **16** of tubing, rod, or wire thereon while the semi-circular cage **14** extends upwardly from the coil-supporting bed **12** to provide support for the outer face of the coil **16**.

The coil-supporting bed **12**, as best shown in FIG. 2, consists of a flanged annulus **18** on which are mounted a plurality of radial anti-friction stub rollers **20**, **22**, **24**, **26**, **28** **30**, **32** and **34**. The radial stub rollers are of sufficient length to afford support to the coil **16**.

The semi-circular cage **14** is composed of a flanged, semi-circular crown **36** held in spaced relation to the coil-supporting bed **12** by means of a plurality of supports **38**. Mounted between the semi-circular crown **36** of the cage structure and the coil-supporting bed **12** are a plurality of elongated anti-friction rollers **40**, **42**, **44**, **46** and **48**. These rollers, together with a pair of short restraining rollers **50** and **52**, effectively restrain the coil **16** in the coil cradle and provide anti-friction supports for the coil in the lateral direction.

At the back of the coil feeding apparatus and below the coil-supporting bed **12** is an undercoating applicator **52** and an extrusion die assembly **54**. A first tube feeder **56** feeds the tube into the undercoating applicator **52** and into the extrusion die **54**. As the coated tubing emerges from the extrusion die assembly **54**, the coating is cooled

by a suitable coolant delivered to the coated tubing by a plurality of coolant nozzles **58**. The end of the coated tubing is then engaged by a second tube feeder **60** which delivers the coated tubing to a coil-receiving drum **62**.

In initiating the coating operation, the leading end of the tubing is separated from the coil in the direction of the coil axis as it passes the radial roller **28**. The separated end of the tubing is directed under the radial stub roller **30** and is then brought under a flanged guide roller **64** at the front of the stand. The flanged guide roller **64** is supported from the flange of the coil-supporting bed **12** and is dependent therefrom such that it is disposed in a plane which is horizontally spaced from that in which the radial stub rollers operate. As the end of the tubing is further advanced, the leading end of the tubing is brought under a second flanged guide roller **66** which is also dependent from the flange of the coil-supporting bed **12**. This latter guide roller positions the end of the tubing to enter the first tube feeder **56** which feeds the tubing through the coating devices, as previously explained. The length of the tubing which has been separated from the coil and which is in the process of being coated is supported in its course by a plurality of short depending axial rollers, such as rollers **68** and **70**, which are shown in FIG. 1. A second set of such rollers (not shown) are located in corresponding positions at the opposite side of the coil-supporting bed **12**.

From the foregoing, it can be seen that a continuous coating process can be performed on coiled tubing or rod without the necessity of uncoiling the same and that the coated tubing is delivered to the coil-receiving drum **62** in coiled form. As stated above, straight lengths of tubing and rod have heretofore been coated in extrusion dies quite similar to that employed herein, but such coating operations were not performed on tubing or rod in the form of a coil. The time and labor saving advantage accruing from the use of a coil feeding apparatus, such as generally described, can be readily appreciated.

FIGS. 3 through 5 disclose the details of the various anti-friction supporting and guiding rollers which are employed in the structure. In FIG. 3, the elongated anti-friction roller **40** and the short depending roller **70** are both mounted on a roller support **72** which is fixed in the flange **74** of the semi-circular crown **36** and in the flange **18** of the coil-supporting bed **12**. Both rollers **40** and **70** are mounted on the roller support **72** by sets of roller bearings **78** and **80** at opposite ends of the rollers.

The radial stub rollers, of which the roller **20** of FIG. 4 is typical, are mounted in a mounting hub **82** by means of a pin **84**. The mounting hub **82** is welded to the flange **18** of the coil-supporting bed **12**. The pin **84** is held therein against turning movement in the mounting hub, and the roller **20** is mounted on the pin by means of a set of anti-friction bearings **88** and **90**; these bearings being located at opposite ends of the rollers.

FIG. 5 is typical of the depending flanged guide rollers **64**, **66** and **67**. The only difference in the structure of the several depending flanged guide rollers is the horizontal plane in which they are disposed. The position of the guide rollers is determined by the length of a depending bracket **92** attached to the flange of the coil-supporting bed **12**. As seen in FIG. 5, the flanged guide roller **66** is mounted on an inwardly extending pin **94** carried at the free end of the depending bracket **92**. The guide roller is mounted on the pin **94** by a set of anti-friction bearings **96** and **98**.

A typical coil feeding apparatus may be five or six feet in diameter, adapting it to handle coils containing in excess of 1000 feet of tubing or rod.

The tube feeders **56** and **60** are substantially identical such that a description of the first tube feeder **56**, as shown in FIGS. 6 and 7, will also serve as a description of the second tube feeder **60**. As shown in FIG. 6, the tube feeder includes a first power roller **100** and a second power roller **102**. These rollers operate respectively in conjunction with a first idler roller **104** and a second idler roller **106**, such that the tube **16** is engaged between these respective sets of rollers and is driven therethrough when the power rollers are rotated. FIG. 7 shows an hydraulic motor **108** associated in driving relation to the first power roller **10**. A similar hydraulic motor is likewise associated with the second power roller for driving the latter.

The power rollers **100** and **102** are mounted on an adjustable mounting plate **110** and the idler rollers **104** and **106** are mounted on an adjustable mounting plate **112**. The mounting plates **110** and **112** are supported by a bed plate **114** which has a pair of guide ribs **116** and **118** at opposite ends thereof. Adjustment of the mounting plates **110** and **112** accommodates the tube feeders to tubing, or rod, of varying diameter. The mounting plate **110** is held against the bed plate **114** by a pair of machine screws **120** and **122** which extend into the bed plate **114** through slots **124** and **126** of the mounting plate. By the same token, the mounting plate **112** is held to the bed plate **114** by means of a pair of machine screws **128** and **130** extending through slots **132** and **134** of the latter mounting plate. Along the outer edge of each mounting plate is an upstanding screw-threaded lug **136** adapted to receive an adjusting screw **138** which can be turned by a hand wheel **140** to rotate the screw **138**. The adjusting screw **138** is fixed against axial movement in an upstanding lug **142** in the bed plate **114**. A similar adjusting arrangement is provided for the mounting plate **112**.

From the foregoing it can be seen that adjustment of the gap between the respective sets of rollers is readily accomplished by relieving the screws **120**, **122**, **128** and **130** and then turning the hand wheels **140** as may be necessary. The mounting plates **110** and **112** are then held in adjusted position by tightening the screws **120**, **122**, **128** and **130**. The tube feeder assembly is fixed to a suitable support **144** by means of a pair of screws **146** and **148** which operate, respectively, in somewhat arcuate elongate slots **150** and **152** formed in the bed plate **114**. The slots **150** and **152** permit limited angular adjustment of the tube feeder on its support **144**.

FIG. 7, which is a vertical sectional view on line **7—7** of FIG. 6, shows the manner in which the tube feeding rollers are mounted. Thus the roller **100**, which is power driven by the hydraulic motor **108**, is mounted by means of a bearing sleeve **154** which is fixed to and extends upwardly from the mounting plate **110**. The power roller **100** is recessed to receive a bearing assemby **156** which is effectively retained between the bearing sleeve **154** and the wall of the roller cavity. A drive sleeve **158** is keyed to the shaft **160** of the hydraulic motor **108** and this drive sleeve is, in turn, keyed to a hub **162** of the roller, whereby rotary power is transmitted from the hydraulic motor **108** to the power roller **100**.

The idler roller **104** is somewhat similarly mounted on its mounting plate **112** which has fixed thereto an upstanding bearing sleeve **164** for receiving the roller. A bearing retaining ring **166** holds anti-friction bearings **168** against the bearing sleeve **164**, and a cavity formed in the idler roller **104** snugly embraces the bearing retainer **166**. The rollers **102** and **106** are constructed and mounted as described in respect to rollers **100** and **104**, respectively.

While the foregoing is a particular description of the first tube feeder **56**, we have stated that the second tube feeder **60** is substantially identical. The only difference between the two feeders is found in the fact that the tube gripping surfaces of the rollers of the second tube feeder **60** are preferably covered with relatively resilient material, such as rubber, to guard against damage to the still relatively soft coating of the tube as it passes through the second tube feeder.

As stated above, the coating process involves the application of a hot undercoating to the exterior of the tubing prior to the application of the plastic coating material.

As the tubing emerges from the first tube feeder **56**, it is passed through the undercoating applicator **52** which is shown in cross-section in FIG. 8. The applicator includes a simple enclosure **170** constituting an undercoating trap. The trap has a passage **172** in its inner side wall through which the tubing passes. Near the top of the trap is an undercoating inlet tube **174** and in the bottom of the trap is an undercoating drain tube **176**. An exit passage **178** is formed in the far face of the trap generally in alignment with the entrance passage **172**. Any suitable undercoating may be applied to the tube as it passes through the applicator. One undercoating material which has been successfully utilized is made by Farboil Company of Baltimore, Maryland under the identifying designation of RSC14000–2. As the hot undercoating is fed through the undercoating inlet **174**, it flows upon the tubing **16** as it passes through the undercoating trap. An undercoating wiper **180** through which the tube passes as it leaves the undercoating applicator serves to spread the undercoating evenly and to remove excess adhesive from the tube. The wiper **180** has a central aperture which corresponds substantially to the outer diameter of the tubing. The wiper is preferably formed of relatively soft elastomeric material such as gum rubber.

The wiper **180** is mounted in a floating wiper plate **182** which is held against the undercoating trap by means of a wiper plate clamp **184**, the latter being attached to the undercoating trap by means of a plurality of circumferentially spaced screws **186**. The floating wiper plate **182** has an annular flange **188** which is seated in a groove **190** formed in the inner face of the wiper plate clamp **184**. The diameter of the groove **190** is somewhat larger than the diameter of the flange **188** such that the wiper plate **182** is free to float with the tubing **16** as the lateral alignment of the tubing may vary upon emerging from the applicator. The floating wiper plate is centered by means of a plurality of spring-pressed lugs **192** seated in the wiper plate clamp **184** and projecting inwardly therefrom into contact with the floating wiper plate **182**. A face plate **194** held to the floating wiper plate **184** by means of a plurality of circumferentially spaced screws **196** holds the wiper **180** within a cavity of the floating wiper plate **182**.

As briefly stated above, as the undercoating coated tubing **16** emerges from the undercoating applicator, it is introduced to the extrusion die assembly **54** where the plastic coating, such as a hot linear high density polyethylene, is applied as a film to the exterior of the tube. One plastic composition which has been successfully employed is Marlex–5005, manufactured and sold by Phillips Chemical Company.

The extrusion die assembly **54** is more completely shown in the sectional view thereof in FIG. 9. By reference to that figure, it can be seen that the extrusion die includes a housing **198** to which a heated plastic composition is fed by way of a plastic inlet **200**. The plastic is fed to the die under pressure by means of and from a source not shown.

The extrusion die itself consists of a die annulus **202** and a concentric die cone **204**. The die annulus **202** is held against the annular housing **198** by means of a bezel **206** which is held against the annular die housing by means of a plurality of circumferentially spaced screws **207**. A spacing ring **208** may be interposed between the die annulus **202** and a shoulder **210** formed at the mouth of the annular die housing. The spacing ring **208** is centered by means of a plurality of screws **212** circumferentially spaced along the annular die housing and extending therethrough in a radial direction into contact with the ring. The die annulus **202** is also centered by a plurality of screws **214** which extend through the bezel **206** in a radial direction at spaced circumferential point and into contact with a land **216** formed on the die annulus **202**.

The cone **204** which forms the inner member of the extrusion die assembly has a flange **218** by which the cone

is attached to the housing by means of a plurality of screws **220** extending through the flange and into the rear face of the annular housing **198**.

In applying the coating, the tubing **16** is driven through the extrusion die assembly at a rate somewhat in excess of that at which the plastic coating material is forced from the extrusion die. This results in the maintenance **222** between the surface of the tubing and the plastic being extruded from the die. Furthermore, it has the effect of stretching the plastic coating into tight engagement with the tubing being coated.

As the coated tubing leaves the extrusion die assembly, the coating thereon is cooled and solidified by a coolant, such as water, which is directed against the coated tubing from the coolant nozzles **58**, as shown in FIG. 2. The now coated tubing next passes through the second tube feeder **60** which, as stated, preferably has a relatively soft cover on the tube gripping faces of its rollers.

An important feature of the invention lies in the fact that the several tubing supports and guides form an arcuate path for the moving tubing, and that the tube engaging and driving rollers **56** and **60** are arranged along said arcuate path such that the course of the path extends between rollers of the respective sets.

As the coated tubing leaves the second tube feeder **60**, it passes over the radial stub roller **30** and is then directed into the coil-receiving drum **62**. Whether or not the tubing moves over or under the several depending guide rollers will depend somewhat on the stiffness of the tubing. In the case of relatively flexible tubing, the tubing is apt to sag in which event the guide rollers may support the tubing. In the case of a relatively stiff tubing, the springiness thereof may resist sagging in which event the tubing may be trained under a particular depending guide roller.

For purpose of explanation, we have illustrated eight radial coil-supporting stub rollers all of which are supported from the flange of the coil-supporting bed and all of which are in the same horizontal plane. It may be found that for some purposes this member may be either increased or decreased. Furthermore, it is contemplated that certain of these coil-supporting rollers may be arranged in different horizontal planes. The diameter of the coil feeding stand, as well as the flexibility of the tube being coated, will have some bearing on the number and location of the radial coil-supporting rollers.

Experimentation will demonstrate the best position for the rollers for any given operation.

As the coated tubing emerges from the coating die, it is guided into the tube receiving drum **62**. The drum is mounted for rotation under the impetus of the moving tube. As shown in FIG. 10, the drum is composed of an upstanding annular side wall **228** and a bottom wall **230**. A plurality of radial reinforcing ribs **232** support the bottom of the drum.

The essential characteristic of the drum is that it be rotatable and to the end that it may rotate easily, it is mounted on a drum stem **234**. The stem is mounted in a seat **236** at the axis of a base spider **238**, the arms of the spider being provided with casters **240** to facilitate movement of the drum into and out of coil receiving position.

The drum is mounted on the drum stem **234** by means of a pair of bearing sleeves **242** and **244**. The elevation of the drum along the drum stem is determined by a pair of shaft collars **246** which are suitably fixed to the drum stem by any convenient means such as set screws.

The bearing sleeves **242** and **244** are seated on and affixed to end plates **248** and **250**, respectively. These end plates constitute caps for a center tube **252** which is seated in an annular groove in the confronting faces of the end plate.

It may be found advantageous to apply a positive driving force to the drum for driving it in rotation. This advantage will become more evident with the larger coils. Furthermore, it is suggested that the coil supporting rollers

be also driven. In this event, the drum and the rollers should be driven in synchronism.

While the novel features of the invention have been illustrated and described in connection with a specific embodiment of the invention, it is believed that this embodiment will enable others skilled in the art to apply the principles of the invention in forms departing from the exemplary embodiment herein, and such departures are contemplated by the claims.

We claim:

1. The method of applying a plastic coating to a length of tubing in coiled form comprising the steps: rotatably supporting a coil of tubing, separating a turn of tubing from said coil only in a direction axial of said coil, passing said axially separated tubing into and through a plastic applying zone while continuously rotating said coil on its axis, applying a plastic coating to said tubing as it emerges from said plastic applying zone, guiding said plastic coated tubing into an arcuate path to maintain its coiled form as it emerges from said plastic applying zone, and rotating said coiled coated tubing continuously on the axis of its coil throughout the coating operation.

2. The method of applying a plastic coating to a length of tubing in coiled form comprising the steps: rotatably supporting a coil of tubing in a horizontal plane, separating a turn of tubing from said coil only in a direction axial of said coil, passing said axially separated tubing into and through a plastic applying zone while continuously rotating said coil on its axis, applying a driving force to said tubing as it enters and emerges from said coating zone, applying a plastic coating to said tubing as it emerges from said plastic applying zone, guiding said plastic coated tubing into an arcuate path to maintain its coiled form as it emerges from said plastic applying zone, and rotating said coiled coated tubing continuously on the axis of its coil throughout the coating operation.

3. The method of applying a plastic coating to a length of tubing in coiled form comprising the steps: rotatably supporting a coil of tubing, separating a turn of tubing from said coil only in a direction axial of said coil, passing said axially separated tubing into and through a plastic applying zone while continuously rotating said coil on its axis, applying a hot plastic coating to said tubing as it emerges from said plastic applying zone, guiding said plastic coated tubing into an arcuate path to maintain its coiled form as it emerges from said plastic applying zone, cooling said coated tubing by application of a cooling fluid thereto as it emerges from said coating zone, and rotating said coiled coated tubing continuously on the axis of its coil throughout the coating operation.

4. In a mechanism for processing a moving length of tube, rod, wire, or the like from a coil thereof, radial and axial anti-friction means for supporting a coil for free turning movement about its axis, means for guiding a turn of a coil on said supporting means into a plane spaced from said coil, a processing station in said latter plane, means for applying a driving force to said coil whereby said coil is rotated on said supporting means and a separated turn thereof is moved through said processing station, and means for receiving in coiled form processed lengths of said coil emerging from said processing station.

5. In a mechanism for processing a moving length of tube, rod, wire, or the like from a coil thereof, a plurality of horizontal and vertical anti-friction rollers for supporting a coil for free turning movement about its axis, means for guiding a turn of a coil on said supporting rollers into a plane spaced from said coil, a processing station in said latter plane, means for applying a driving force to said coil whereby said coil is rotated on said supporting rollers and a separated turn thereof is moved through said processing station, and means for receiving in coiled form processed lengths of said coil emerging from said processing station.

6. In a mechanism for processing a moving length of tube, rod, wire, or the like from a coil thereof, a plurality of horizontal and vertical anti-friction rollers for supporting a coil for free turning movement about its axis, means for guiding a turn of a coil on said supporting rollers into a plane spaced from said coil, a processing station in said latter plane, means for applying a driving force to said coil whereby said coil is rotated on said supporting rollers and a separated turn thereof is moved through said processing station, and rotary means for receiving in coiled form processed lengths of said coil emerging from said processing station.

7. In a mechanism for processing a moving length of tube, rod, wire, or the like from a coil thereof, radial and axial anti-friction means for supporting a coil for free turning movement about its axis, means for guiding a turn of a coil on said supporting means into a plane spaced from said coil, plastic coating means in said latter plane, means for applying a driving force to said coil whereby said coil is rotated on said supporting means and a separated turn thereof is moved through said plastic coating, and means for receiving in coiled form coated lengths of said coil emerging from said plastic coating means.

8. In a mechanism for processing a moving length of tube, rod, wire, or the like from a coil thereof, a plurality of radial and anti-friction rollers for supporting a coil for free turning movement about its axis, axial anti-friction rollers for restraining the lateral movement of a coil on said radial anti-friction rollers, a plurality of guide rollers axially spaced from said radial anti-friction rollers for guiding a turn of a coil on said radial anti-friction rollers into a plane spaced from said coil, a processing station in said latter plane, means for applying a driving force to said coil whereby said coil is rotated on said radial anti-friction rollers and a separated turn thereof is moved through said processing station, and means for receiving in coiled form processed lengths of said coil emerging from said processing station.

9. In a mechanism for processing a moving length of tube, rod, wire, or the like from a coil thereof, radial and axial anti-friction means for supporting a coil for free turning movement about its axis, means for guiding a turn of a coil on said supporting means into a plane spaced from said coil, a processing station in said latter plane, means for applying a driving force to said coil whereby said coil is rotated on said supporting means and a separated turn thereof is moved through said processing station, and rotary coil-receiving means for receiving in coiled form processed lengths of said coil emerging from said processing station.

10. In a mechanism for processing a moving length of tube, rod, wire, or the like from a coil thereof, a plurality of radial anti-friction means for supporting a coil for free turning movement about its axis, axial anti-friction means for restraining the lateral movement of a coil on said radial anti-friction means, a plurality of guides axially spaced from said radial anti-friction means for guiding a turn of a coil on said supporting means into a plane spaced from said coil, a processing station in said latter plane, means for applying a driving force to said coil whereby said coil is rotated on said radial anti-friction means and a separated turn thereof is moved through said processing station, and a rotary support for receiving in coiled form processed lengths of said coil emerging from said processing station.

11. In a mechanism for processing a moving length of tube, rod, wire, or the like from a coil thereof, a plurality of anti-friction rollers for supporting a coil for free turning movement about its axis, axial anti-friction rollers for restraining the lateral movement of a coil on said radial anti-friction rollers, a plurality of guides axially spaced from said anti-friction rollers for guiding a turn of a coil on said supporting means into a plane spaced from said coil, a plastic coating die in said latter plane,

means for applying a driving force to said coil whereby said coil is rotated on said radial anti-friction rollers and a separated turn thereof is moved through said plastic coating die, and means for receiving in coiled form processed lengths of said coil emerging from said processing station.

12. In a mechanism for processing a moving length of tube, rod, wire, or the like from a coil thereof, an annular table, radial and axial anti-friction means carried by said table for supporting a coil on said table for free turning movement about its axis, means for guiding a turn of a coil on said table into a plane spaced from said coil, a processing station in said latter plane, means for applying a driving force to said coil whereby said coil is rotated on said table and a separated turn thereof is moved through said processing station, and means for receiving in coiled form processing lengths of said coil emerging from said processing station.

13. In a mechanism for processing a moving length of tube, rod, wire, or the like from a coil thereof, an annular table, radial and axial anti-friction means carried by said table for supporting a coil for free turning movement about its axis, means for guiding a turn of a coil on said table into a plane spaced from said coil, a plastic applying die in said latter plane, means for applying a driving force to said coil whereby said coil is rotated on said table and a separated turn thereof is moved through said plastic applying die, and a rotary support for receiving in coiled form coated lengths of said coil emerging from said plastic applying die.

14. In a machine for processing a moving length of tube in a coil thereof, a table adapted to support and guide a coil in rotation, means for guiding a turn of a coil on said table into an arcuate plane spaced laterally of said coil, a plastic applying die having an entrance side and an exit side in said latter plane, a first set of

tube engaging and driving rollers at the entrance side of said die, and a second set of tube engaging and driving rollers at the exit side of said die, the rollers of each set being arranged along said plane such that the arcuate course thereof extends between rollers of said sets.

15. In a machine for processing a moving length of tube in a coil thereof, a table adapted to support and guide a coil in rotation, means for guiding a turn of a coil on said table into an arcuate plane spaced laterally of said coil, a plastic applying die having an entrance side and an exit side in said latter plane, a first set of tube engaging and driving rollers at the entrance side of said die, a second set of tube engaging and driving rollers at the exit side of said die, the rollers of each set being arranged along said plane such that the arcuate course thereof extends between rollers of said sets, and means for adjustably mounting said sets of tube engaging and driving rollers along said plane.

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