Feb. 16, 1971 J. H. OSGOOD ET AL 3,562,864

COILER ASSEMBLY

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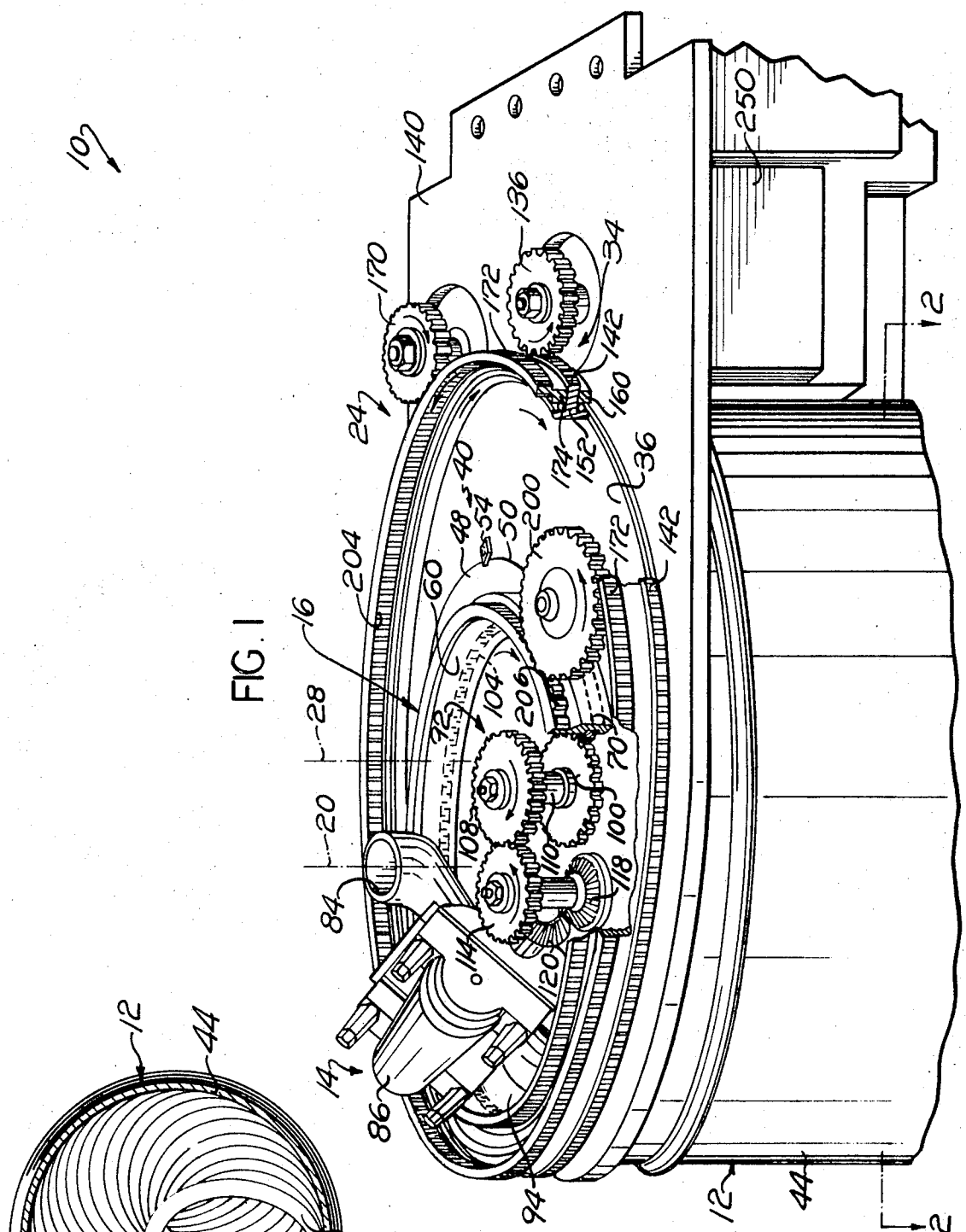


FIG. 1

FIG. 2

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COILER ASSEMBLY

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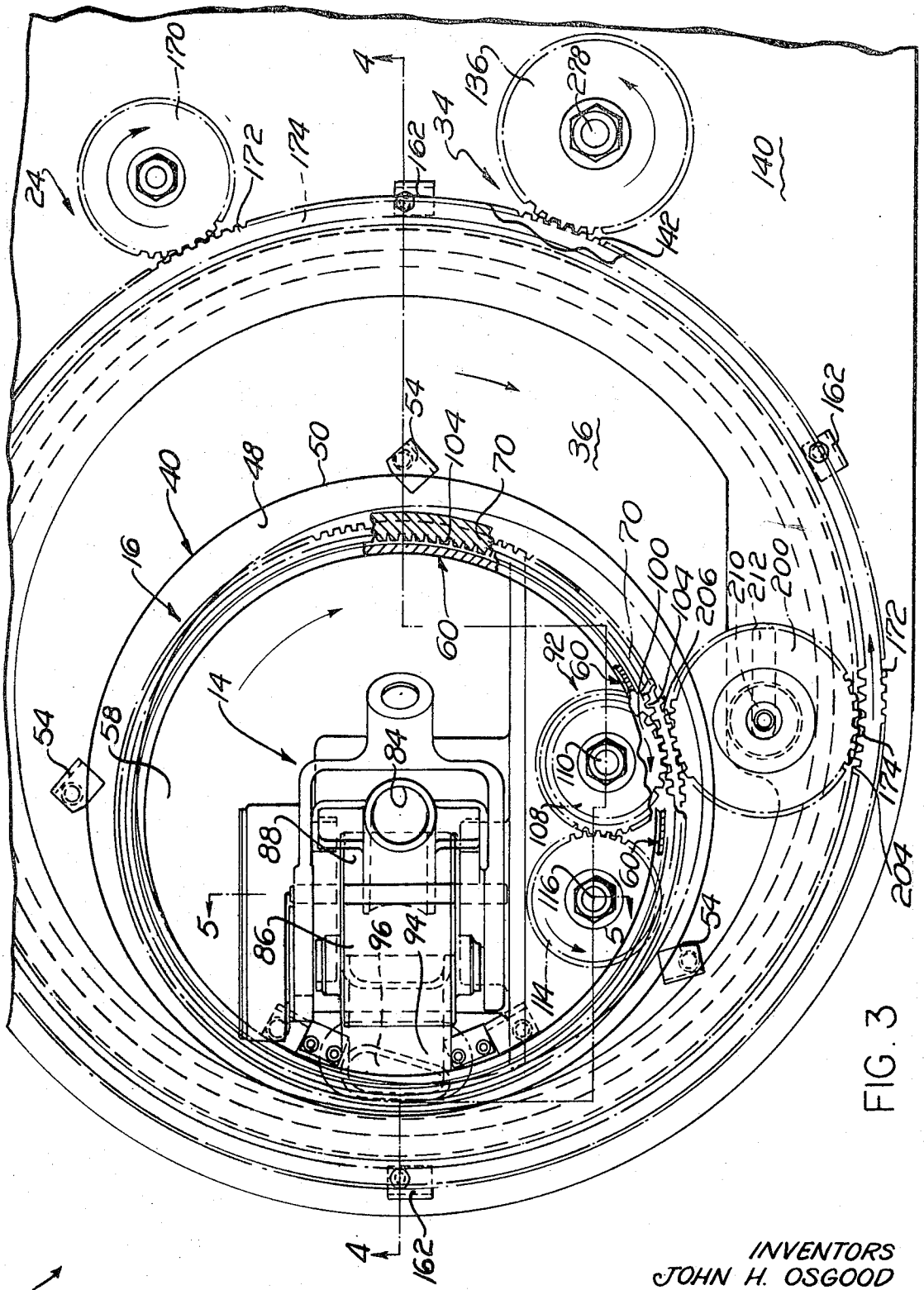


FIG. 3

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COILER ASSEMBLY

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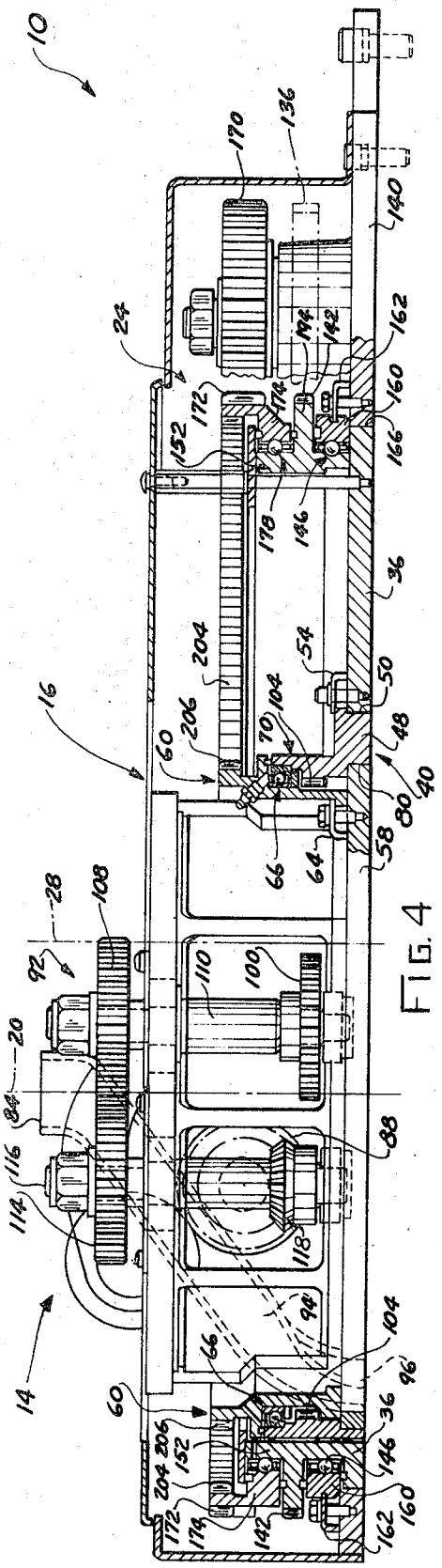


FIG. 4

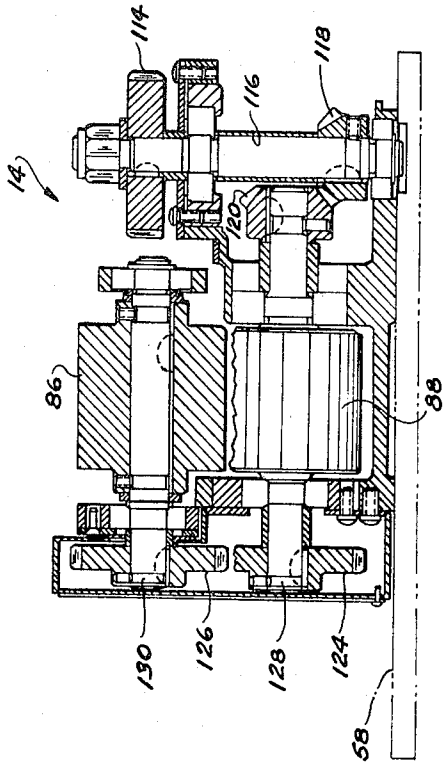


FIG. 5

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COILER ASSEMBLY

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FIG. 6

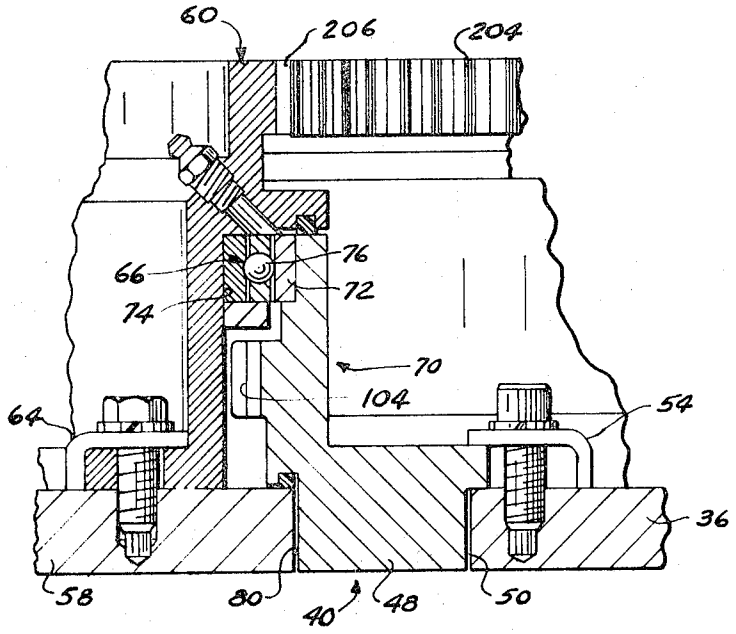
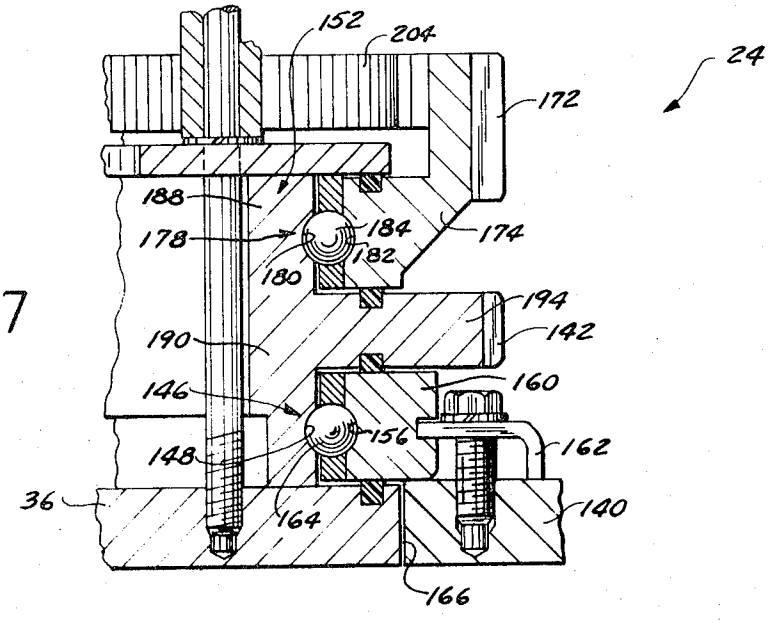


FIG. 7



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COILER ASSEMBLY

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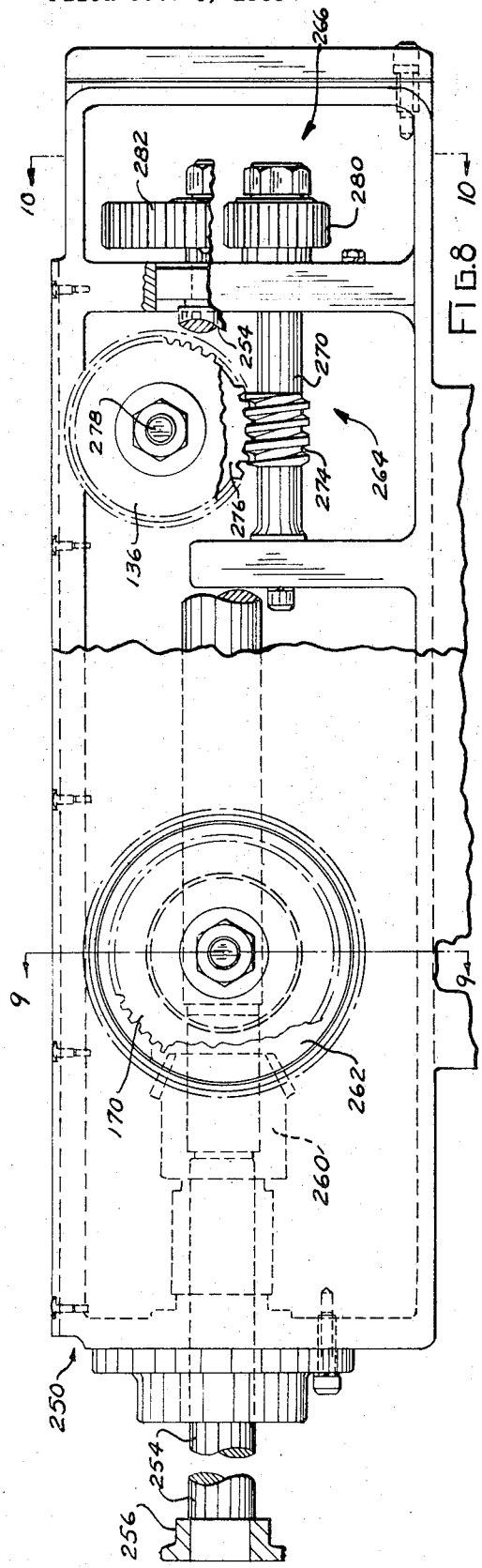


FIG. 8

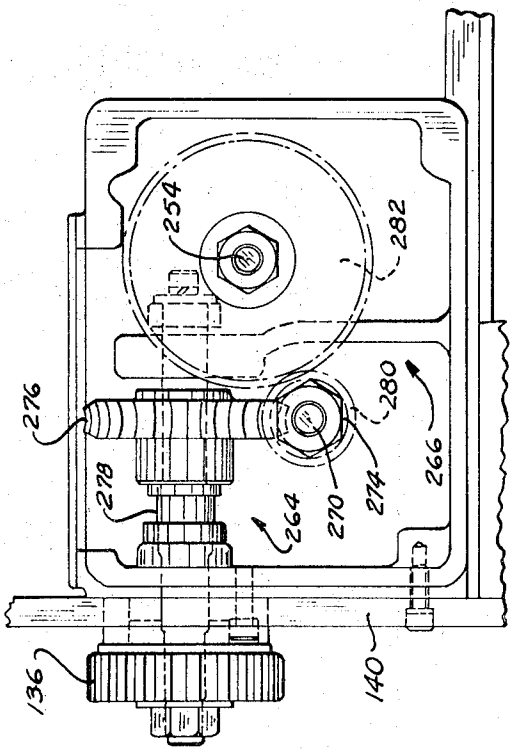


FIG. 10

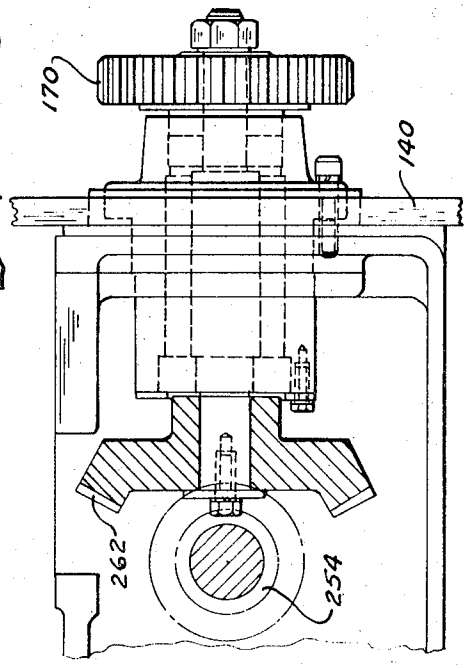


FIG. 9

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United States Patent Office 3,562,864 Patented Feb. 16, 1971

3,562,864

COILER ASSEMBLY

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Int. Cl. B65h 54/80
U.S. Cl. 19—159 25 Claims

ABSTRACT OF THE DISCLOSURE

An improved coiler assembly for coiling sliver in a stationary container includes a coiler head which is simultaneously rotated by a first drive train about an axis which is offset from a central axis of the container and by a second drive train about the central axis of the container. Rotation of the coiler head about the first axis results in the formation of a coil of sliver in the container while rotation about the central axis of the container displaces loops of the coil of sliver relative to each other. An eccentric is provided for adjusting the position of the coiler head relative to the central axis of the container to enable sliver of different thicknesses to be coiled in the same relationship with a wall of the container. A transmission means for connecting the drive trains to a source of power includes a plurality of pairs of gears so that the gear ratio of the transmission means and the rate at which the coiler head is rotated around the central axis of the container can be adjusted to vary the extent to which the loops of sliver are displaced relative to each other.

This invention relates generally to a coiler assembly and more particularly to an assembly for coiling sliver in a stationary container.

Sliver is packer in containers by rotating a coiler head with a drive train to deposit the sliver in convoluted form, that is in a coil having its loops at least partially displaced relative to each other. It is desirable to be able to vary the extent of displacement of the loops of sliver relative to each other to enable a greater or lesser number of loops of sliver to be deposited at any given level in the container. It is also desirable to locate loops of sliver of different thicknesses in the same relationship with a wall of the container.

Accordingly, it is an object of this invention to provide a new and improved drive mechanism which is both compact and dependable for rotating a coiler head to deposit sliver in convolutions in a container.

Another object of this invention is to provide a new and improved sliver coiler assembly for packing sliver in a convoluted form in a container wherein the coiler assembly is selectively adjustable to locate loops of sliver of different thicknesses in the same relationship with a wall of the container.

Another object of this invention is to provide a new and improved coiler assembly for packing sliver in a convoluted form in a container wherein the coiler assembly includes an adjustable drive to enable the extent of displacement of the loops of sliver relative to each other to be selectively varied.

These and other objects and features of the invention will become more apparent upon a consideration of the following description taken in connection with the accompanying drawings wherein:

FIG. 1 is a schematic illustration of a coiler assembly for packing sliver in a stationary container;

FIG. 2 is a sectional schematic illustration, taken on a reduced scale along a line 2—2 of FIG. 1, showing the relationship of the coiled sliver to a wall of the container;

FIG. 3 is a schematic plan illustration, on an enlarged scale, showing drive trains for rotating a coiler head of the coiler assembly of FIG. 1;

FIG. 4 is a sectional view, taken along the line 4—4 of FIG. 3, illustrating the mounting of a coiler plate on a base and the mounting of the coiler head on the coiler plate;

FIG. 5 is a sectional view taken along the line 5—5 of FIG. 3, illustrating a calender roll assembly mounted on the coiler head for feeding sliver into the stationary container;

FIG. 6 is an enlarged sectional view further illustrating the mounting of the coiler head on the coiler plate;

FIG. 7 is an enlarged sectional view further illustrating the mounting of the coiler plate on the base;

FIG. 8 is a partially broken away view of a transmission for connecting the coiler assembly with a source of power;

FIG. 9 is a sectional view, taken along the line 9—9 of FIG. 8, illustrating the relationship between the transmission and a drive train for rotating the coiler head relative to an axis offset from a central axis of the container; and

FIG. 10 is a sectional view, taken along the line 10—10 of FIG. 8, illustrating the relationship between the transmission and a drive train for rotating the coiler head relative to the central axis of the container.

The present invention provides a sliver coiler assembly having a coiler head which is rotated about a first axis relative to a stationary container by a first drive train to form a coil of sliver having a plurality of loops. The coiler head is rotated by a second drive train about a second axis to offset the loops of sliver relative to each other. The rate at which the second drive train rotates the coiler head relative to the second axis can be selectively varied to alter the extent to which the loops of sliver are displaced relative to each other. The position of the coiler head relative to a wall of the container can be changed by turning an eccentric to thereby enable the coiler head to be adjusted to deposit loops of sliver of different thicknesses in the same relationship with the wall of the container.

A coiler assembly **10** for packing sliver, i.e. an untwisted strand or rope of textile fiber, in a stationary container **12** is illustrated in FIG. 1 and is constructed in accordance with the present invention. The sliver is fed into the stationary container **12** by a calender roll assembly **14** mounted on a rotatable coiler head **16**. The sliver is formed into a coil as it is fed from the calender roll assembly **14** by rotation of the coiler head **16** in a clockwise direction (when viewed from above in FIG. 1) about its central axis, indicated at **20** in FIGS. 1 and 4, by a first or coiler head drive train **24**. During this rotation of the coiler head **16** about the first axis **20** and the feeding of the sliver into the stationary container **12** by the calender roll assembly **14**, the coiler head **16** is also rotated about a second axis **28** which is offset relative to the first or coiler head axis **20** and is coincident with the central axis of the container **12**. Rotation of the coiler head **16** about the second axis **28** displaces the loops **32** of sliver (see FIG. 2) relative to each other so that the sliver is deposited in the stationary container **12** in a generally convoluted form with the loops displaced relative to each other and packed in a series of layers or levels. A second or coiler plate drive train **34** rotates the coiler head **16** about the axis **28** in a generally clockwise direction (when viewed from above in FIG. 1) by rotating a coiler plate **36** on which the coiler head is mounted.

It is contemplated that the coiler assembly **10** will be used for coiling and packing sliver having different thicknesses. In order to provide for neat and compact

packing of sliver of different thicknesses in containers similar to the container **12**, an adjustment assembly **40** is provided for varying the distance between the calender roll assembly **14** and a vertically extending side of the container. The adjustment assembly **40** enables loops of sliver of different thicknesses to be positioned in the container **12** with their outer peripheries, indicated at **42** in FIG. 2, in abutting engagement with a cylindrical wall **44** of the container. Accordingly, the adjustment assembly **40** includes an eccentric **48** (see FIGS. 1, 3 and 4) which is located in a circular opening **50** in the coiler plate **36** and is rotatable relative to the coiler plate to vary the distance which the axis **20** and calender roll assembly **14** are offset from the central axis **28** and sidewall **44** of the container **12**. Suitable clamping means **54** (see FIGS. 3 and 4) is provided for holding the eccentric **48** against unwanted rotation once the coiler head **16** has been set to a predetermined position relative to the sidewall **44** of the container **12**.

The coiler head assembly **16** supports the calender roll assembly **14** for rotation about the central axis **20** of the coiler head assembly. To this end, the calender roll assembly **14** is mounted on a circular plate or bottom wall **58** of the coiler head assembly **16** (see FIGS. 3 and 4). A generally circular axially extending wall or rim **60** (FIG. 4) is connected to the head plate **58** by clamps **64**. The coiler head **16** is rotatably connected to the eccentric **48** and coiler plate **36** by a bearing assembly **66** (see FIGS. 4 and 6) located between the wall **60** of the coiler head **16** and a wall or rim **70** of the eccentric **48**. The bearing assembly **66** (FIG. 6) includes an outer race **72** which is connected to the rim **70** of the eccentric **48** and an inner race **74** which is connected to the wall **60** of the coiler head **16**. Suitable rollers or balls **76** engage the races **72** and **74** to mount the coiler head **16** for rotation relative to the eccentric **48** and to retain the coiler head **16** against axial movement. The plate **58** extends into a recess **80** formed in the eccentric **48** to further retain the coiler head **16** against axial movement in the upward direction. This additional protection against upward movement of the coiler head **16** is necessitated by the pressure which the sliver exerts against the bottom surface of the coiler head after the container **12** has been filled and additional sliver is being packed into the container.

The coiler head **16** and calender roll assembly **14** are rotated about the central axis **20** of the coiler head **16** by the first or coiler head drive train **24** to form the sliver in a coil as it is being fed into the container by the calender roll assembly **14**. The sliver enters the calender roll assembly through a trumpet **84** (FIGS. 3 and 4) which extends downwardly toward the nip of a pair of calender rolls **86** and **88** which are driven by a calender roll drive assembly **92** to feed the sliver through a tube **94** and an opening **96** in the plate **58**. The calender roll assembly **14** is driven by the drive assembly **92**, while the coiler head **16** is rotated, to feed the sliver into the container **12** through the opening **96**. The aforementioned rotation of the coiler head **16** about its central axis **20** forms the sliver into a coil as it is fed from the calender roll assembly **14** into the container **12**.

In order to form the sliver into a coil having uniform loop **32**, the rate at which the sliver is fed by the calender roll assembly **14** is directly proportional to the rate of rotation of the coiler head **16** relative to the coiler plate **36**. This is because the power input to the calender roll drive assembly **92** is through a spur gear **100** which extends through an aperture in the axially extending wall **60** (FIG. 3) to engage a ring gear **104** formed on an interior side of the axially extending wall **70**. Since the ring gear **104** rotates with the coiler plate **36**, rotation of the coiler head **16** relative to the coiler plate **36** drives the gear **100** to operate the calender roll assembly **14**. Rotation of the spur gear **100** drives the calender roll assembly through the drive assembly **92** which further includes a change or calender gear **108** which is mounted on a shaft **110** in meshing engagement with a second change or calender gear **114**. The gear **114** is in turn mounted on a shaft **116** upon which a crown gear **118** (see FIG. 5) is mounted in meshing engagement with a crown gear **120** connected to the lower calender roll **88**. The upper calender roll **86** is driven by means of meshing gears **124** and **126** which are connected to the axles **128** and **130** of the calender rolls **86** and **88**.

The coiler head **16** is rotated about the central axis **28** of the container **12** simultaneously with the rotation of the coiler head about the axis **20** to displace the loops **32** of coiled sliver relative to each other. Since the displacement of each of the loops **32** is relatively small compared to the length of the sliver which must be fed to form each of the loops, the rate of rotation of the coiler head **16** about the axis **28** is relatively slow compared to the rate of rotation of the coiler head about the axis **20**. This relatively slow rotation about the axis **28** allows the calender roll assembly **14** to feed the sliver necessary to form the loops **32** as the loops are displaced. The coiler head **16** is rotated about the axis **28** by the second or coiler plate drive assembly **34** which includes a drive gear **136** mounted on a base **140** (see FIGS. 1, 3 and 4). Rotation of the drive gear **136** rotates a ring gear **142** which is fixedly connected to the coiler plate **36** to rotate the coiler plate about the central axis **28** of the container **12**, the axis **28** being coincident with the central axis of the generally circular coiler plate **36**. Since the coiler head **16** is supported on the coiler plate **36**, rotation of the coiler plate about the central axis **28** also rotates the coiler head **16** about the axis **28**. As the coiler head **16** is rotated about the axis **28** the loops of sliver being formed by rotation of the coiler head **16** about the axis **20** are deposited in the container **12** in a manner similar to that illustrated in FIG. 2.

The coiler plate **36** is rotatably connected to the base **140** by a bearing assembly **146** (see FIG. 7) which also retains the coiler plate **36** against axial movement. The bearing assembly **146** has an inner race **148** on an axially extending wall or rim **152** of the coiler plate **36**. An outer race **156** of the bearing assembly **146** is formed on an annular blocking member or ring **160** which is secured to the base **140** by clamps **162**. A bearing roller element or ball **164** engages the races **148** and **156** in a known manner to facilitate relative rotation between the coiler plate **36** and base **140**. The bearing elements **164** also cooperate with the races **148** and **156** to retain the coiler plate **36** against axial movement relative to the base **140**. The coiler plate **36** includes a portion which extends radially beyond the wall **152** into a recess **166** formed between the base **140** and a lower surface of the blocking ring **160**. This engagement between the coiler plate **36** and the lower surface of the blocking ring **160** prevents the coiler plate from being moved upwardly by sliver within the container **12** as the container is being packed with sliver.

The first or coiler head drive train **24** (see FIGS. 1, 3 and 4) rotates the coiler head **16** about the axis **20** as the coiler head is being rotated about the central axis **28** of the container **12**. To this end, the coiler head drive train **24** includes a drive gear **170** which is rotatably mounted on the base **140** in meshing engagement with a ring gear **172** formed on an outer portion of an annular support member **174** (see FIGS. 4 and 7). The support member **174** is rotatably mounted on the wall **152** by a bearing assembly **178** (FIG. 7) having an inner race **180** and an outer race **182** with bearing rollers or balls **184** between the races. It should be noted that the drive train **24** is relatively compact due to the mounting of the annular support member **174** on an upper portion **188** of the wall **152** and the connecting of the wall **152** to the blocking member **160** by the bearing assembly **146** on a lower portion **190** of the wall. The compactness of the combined drive trains **24** and **34** is promoted due to the

formation of the ring gear **142** of the drive train **34** on a radially outer portion of a flange **194** located between the bearing assemblies **146** and **178**.

In addition to the gears **170** and **172**, the coiler head drive train **24** includes an idler gear **200** which is mounted in meshing engagement with a ring gear **204** formed on a radially inner portion of the support member **174** (see FIG. 3). The idler gear **200** in turn drives a ring gear **206** which is formed on a radially outer portion of the coiler head wall **60**. Thus, rotation of the support member **174** relative to the coiler plate **36** by the drive gear **170** rotates the idler gear **200**, through the ring gears **172** and **204**, to rotate the coiler head **16** by means of the ring gear **206** which is fixedly connected to the coiler head. The idler gear **200** is mounted on a shaft **210** (see FIG. 3) which is slidably mounted in a slot **212** for movement relative to the coiler plate **36** to enable the idler gear **200** to be maintained in meshing engagement with the ring gear **206** and the ring gear **204** when the eccentric **48** is rotated to adjust the position of the coiler head **16** relative to the coiler plate **36**.

In order to coordinate the rotation of the coiler head **16** about the two axes **20** and **28**, the drive trains **24** and **34** are connected to a source of power by a common transmission assembly **250** (see FIGS. 1 and 8). The transmission assembly **250** includes a central or main drive shaft **254** (FIG. 8) which is connected by a suitable coupling **256** to a source of power. A crown gear **260** is connected to the drive shaft **254** for driving the coiler head drive gear **170** (see FIG. 1 also) through meshing engagement with a second crown gear **262** (see FIG. 9). The coiler plate drive gear **136** (FIG. 8) is operatively connected to the main drive shaft **254** by a gear assembly **264**. The gear assembly **264** includes a pair of gears **266** which drivingly connect the shaft **254** to a secondary drive shaft **270**. The secondary drive shaft **270** is drivingly connected by a worm gear **274** with a wheel **276** (see FIGS. 8 and 10). The wheel **276** is connected with the drive gear **136** by a shaft **278**.

Under certain circumstances it is desirable to be able to vary the extent to which the loop of sliver are displaced relative to each other. To this end, the transmission **250** is adjustable to vary the rate at which the coiler head **16** is rotated about the axis **28** relative to the rate at which the coiler head is rotated about the axis **20**. Varying the rate at which the coiler head rotates about the axis **28**, while maintaining constant the rate at which the coiler head **16** rotates about the axis **20**, enables the displacement between the loops to be varied as they are formed by the rotation of the coiler head **16** about the axis **20**. To facilitate this variation in rate of rotation of the coiler head **16** about the axis **28**, the transmission **250** includes a set of gears made of a plurality of pairs of gears (only the pair **266** being shown) having different numbers of teeth and mountable in meshing engagement on the shafts **270** and **254**. By replacing the pair of gears illustrated in FIGS. 8 and 10, that is gears **280** and **282**, with a pair of gears (not shown) having a different drive ratio, the rate of rotation of the drive gear **136** is varied relative to the rate of rotation of the drive gear **170**. By varying the rate of rotation of the drive gear **136** relative to the drive gear **170**, the rate of rotation of the coiler head **16** about the axis **28** is varied relative to the rate of rotation of the coiler head about the axis **20** to effect variation in the extent of displacement of the loops of sliver relative to each other.

When the rate of rotation of the coiler head **16** about the axis **28** is varied by changing the gears **280** and **282**, the rate at which the sliver is fed by the calender rolls **86** and **88** is not changed to such an extent as to maintain the same relationship between the rate of sliver feed and the rate of rotation of the calender roll assembly **14** about the axis **28**. This is because the rate of sliver feed is determined by the rate of relative rotation between the ring gear **204** in one direction and the rate of rotation of the coiler plate **36** in the opposite direction. When the relationship between the rate of rotation of the calender roll assembly **14** about the axis **28** and the rate of sliver feed varies, the shape of the loops **32** will be changed from the generally circular configuration shown in FIG. 2.

In order to maintain the configuration of the loops **32** substantially constant with variations in the rate of rotation of the calender roll assembly **14** about the axis **28**, the change or calender gears **108** and **114** are changeable or variable to change the rate at which the rolls **86** and **88** are driven. To this end, a plurality of sets of change gears are provided. Each set of change gears is generally similar to the set of change gears including the gears **108** and **114** and are sized to drive the calender rolls **86** and **88** at different rates. By replacing the change gears **108** and **114** with a set of change gears having a suitable drive ratio when the drive ratio of the gears **280** and **282** is changed, the rate of sliver feed by the rolls **86** and **88** can be varied to maintain the shape of the loops **32** of sliver substantially constant.

In view of the foregoing remarks it can be seen that the coiler assembly **10** includes a coiler head **16** which is rotated about a first axis **20** by a coiler head drive train **24**. The drive train **24** includes a drive gear **170** which rotates ring gears **172** and **204** relative to the coiler plate **36**. Rotation of the ring gear **204** relative to the coiler plate **36** causes the idler gear **200** to rotate the coiler head **16** through the ring gear **206**. As the coiler head **16** rotates relative to the coiler plate **36**, the ring gear **104** drives the calender roll assembly **14** through the drive assembly **92**. The calender roll assembly **14** is mounted for rotation with the coiler head **16** so that the sliver is coiled in the stationary container **12** as the calender roll assembly is rotated with the coiler head **16** about the axis **20**.

The loops of sliver are offset or displaced relative to each other by rotation of the coiler head **16** and calender roll assembly **14** about the central axis **28** of the container **12**. By selectively changing the gearing in the transmission **250**, the rate at which the coiler head is rotated about the axis **28** can be varied to vary the displacement of the loops relative to each other. Since a relatively large number of loops of sliver are deposited on each level in the container **12** and each loop is offset a small distance relative to the next adjacent loop, the coiler plate **36** is rotated at a relatively slow rate around the axis **28** by the drive train **24** contemporaneously with the rotation of the coiler head **16** about the axis **20**.

Having described my invention herewith, I claim:

1. A coiler assembly for use in coiling sliver within a container, said coiler assembly comprising a base, a calender roll assembly supported by said base for feeding the sliver into the container while the container is substantially stationary, a first drive means for rotating said calender roll assembly relative to both said base and container about a first axis which is offset relative to a central axis of the container to enable the sliver to form a coil having a plurality of loops as the sliver is fed into the container by said calender roll assembly, a second drive means for rotating said calender roll assembly relative to said base about a second axis which is aligned with the central axis of the container simultaneously with the rotation of said calender roll assembly about the first axis to thereby displace the loops of sliver relative to each other in the substantially stationary container, transmission means for connecting said first and second drive means with a source of power, said transmission means including selectively variable gear means for varying the rate at which said calender roll assembly is rotated relative to the base about the second axis to thereby enable the extent to which the loops of sliver are displaced relative to each other to be varied, eccentric means for varying the distance between said calender roll assembly and the second axis to enable the relationship between the calender roll assembly and the substantially stationary container to be varied to locate the periphery of loops of sliver having different thicknesses

in the same relationship with the side of the substantially stationary container, a generally circular coiler plate positioned between said base and eccentric means, said eccentric means being mounted in an opening in said coiler plate and rotatable relative to said coiler plate to effect the variation in the distance between said calender roll assembly and the second axis, said coiler plate being mounted for rotation about the second axis under the influence of said second drive means, and an axially extending generally circular wall connected to said coiler plate, said second drive means including a radially outwardly extending flange connected to said wall with a first ring gear formed on a radially outermost portion of said flange, a first drive gear mounted on said base in meshing engagement with said first ring gear for rotating said first ring gear and coiler plate relative to said base about the second axis, said first drive means including an annular support member rotatably mounted on said flange, a second ring gear formed on a radially outer portion of said support member, a second drive gear mounted on said base in meshing engagement with said second ring gear for rotating said support member relative to said flange and coiler plate, and gear means for drivingly interconnecting said support member and said calender roll assembly to rotate said calender roll assembly about said first axis upon rotation of said support member.

2. A coiler assembly as set forth in claim **1** wherein said calender roll assembly includes a plurality of rolls for feeding the sliver and calender gear means for driving said calender rolls, said calender gear means being selectively variable to vary the rate at which the rolls are driven to enable the configuration of the loops of sliver to be maintained substantially constant with variations in the rate of rotation of the calender roll assembly about the second axis.

3. A coiler assembly for use in coiling sliver within a stationary container, said coiler assembly comprising a base, a calender roll assembly supported by said base for feeding the sliver into the stationary container, first drive means for rotating said calender roll assembly relative to both said base and container about a first axis which is offset relative to a central axis of the container to enable the sliver to form a coil having a plurality of loops as the sliver is fed into the container by said calender roll assembly, second drive means for rotating said calender roll assembly relative to said base and container about a second axis which is aligned with the central axis of the container simultaneously with the rotation of said calender roll assembly about the first axis to thereby displace the loops of sliver relative to each other, a first member mounted for rotation by said first drive means about the first axis and connected with said calender roll assembly and a second member mounted for rotation by said second drive means about said second axis, adjustment means for varying the distance between the first and second axes to enable the relationship between said calender roll assembly and container to be selectively varied to locate the periphery of loops of sliver having different thicknesses in the same relationship with a side of the container, said adjustment means including an eccentric member mounted on said second member and extending around said first member, said eccentric member being movable relative to at least one of said first and second members to vary the position of said first member relative to said second member to thereby effect the variation in the distance between the first and second axes, and a third drive means for operating said calender roll assembly, said third drive means including a ring gear fixedly connected to said eccentric member and a gear mounted on said first member in meshing engagement with said ring gear, said gear mounted on said first member being rotatable by relative rotation between said first member and said eccentric member to drive said calender roll assembly.

4. A coiler assembly as set forth in claim **3** further including transmission means for connecting said first and second drive means to a source of power, said transmission means including selectively changeable input gear means associated with said second drive means for enabling said calender roll assembly to be rotated about the second axis at different rates to thereby vary the amount of displacement of the loops of sliver relative to each other.

5. A coiler assembly as set forth in claim **4** wherein said calender roll assembly includes a plurality of rolls which are rotatable to feed the sliver and calender gear means operatively associated with said second drive means for driving said calender rolls at a rate which varies with variations in the rate of rotation of said calender roll assembly about the second axis, said calender gear means being selectively changeable to enable the rate of rotation of the calender rolls to be varied in such a manner as to maintain the configuration of the loops of sliver substantially constant with variations in the rate of rotation of the calender roll assembly about the second axis.

6. A coiler assembly for use in coiling sliver within a stationary container, said coiler assembly comprising a coiler head assembly including a plurality of calender rolls for feeding the sliver into the stationary container, base means for supporting said coiler head assembly above the stationary container which receives sliver from said calender rolls, a generally circular coiler plate located between said base means and coiler head assembly, an axially extending and generally circular wall connected to said coiler plate, said wall including a radially outwardly extending flange with a first ring gear formed on a radially outermost portion of said flange, a first drive gear mounted on said base means in meshing engagement with said first ring gear for rotating said first ring gear and coiler plate relative to said base means about a central axis of said container, said coiler head assembly including a second ring gear mounted for rotation with said coiler head assembly about another axis offset from the central axis of the container, an annular support member rotatably mounted on said wall, a third ring gear formed on a radially inwardly portion of said support member, an idler gear rotatably mounted on said coiler plate in meshing engagement with said second and third ring gears for transmitting drive forces therebetween, a fourth ring gear formed on a radially outer portion of said support member, and a second drive gear mounted on said base means in meshing engagement with said fourth ring gear for rotating said support member relative to said flange and coiler plate to thereby rotate said idler gear and coiler head assembly, said coiler head assembly being rotatable about the other axis at a first rate upon rotation of said second drive gear to form a coil of sliver in the container, said coiler plate and coiler head assembly being rotatable about the central axis of the container at a second rate which is slower than the first rate upon rotation of said first drive gear to displace the loops of the coiler of sliver relative to each other.

7. A coiler assembly as set forth in claim **6** further including a generally circular and axially support rim connected to said coiler plate for rotatably supporting said coiler head assembly, and a fifth ring gear formed on a radially inner portion of said support rim and located axially inwardly of said second ring gear, said coiler head assembly including gear means mounted in meshing engagement with said fifth ring gear for driving said calender roll assembly at a rate which is a function of the rate of rotation of said coiler head assembly relative to said coiler plate.

8. A coiler assembly as set forth in claim **6** wherein said gear means includes a plurality of gears which are selectively interchangeable to vary the rate at which the calender roll assembly is driven and the rate at which sliver is fed into the container with variations in the rate of rotation of said coiler head assembly relative to said coiler plate.

9. A coiler assembly as set forth in claim 6 further including bearing means having one race on said base means and another race on said wall to support said coiler plate for rotation relative to said base means and to retain said coiler plate against axial movement relative to said base means.

10. A coiler assembly as set forth in claim 6 further including adjustment means for varying the distance between said calender roll assembly and the central axis of the container to enable the relationship between the calender roll assembly and the container to be varied to locate the periphery of loops of sliver having different thicknesses in the same relationship with the container.

11. A coiler assembly as set forth in claim 10 wherein said adjustment means includes an eccentric located between said coiler plate and coiler head assembly for varying the position of said coiler head assembly relative to said coiler plate.

12. A coiler assembly as set forth in claim 11 further including a generally circular support rim located on said eccentric for supporting said coiler head assembly, said eccentric being fixedly connected to said support rim and including a circular surface which engages said coiler plate at a location outwardly of said support rim.

13. A coiler assembly as set forth in claim 12 wherein said coiler head assembly includes a support plate which is located within an opening defined by said eccentric and is rotatable relative to said eccentric and said eccentric includes an abutment surface for engaging an upper surface portion of said support plate to retain said support plate against axially upward movement relative to said coiler plate.

14. A coiler assembly as set forth in claim 6 further including transmission means for driving said first and second drive gears, said transmission means including changeable gear means for enabling the speed of relative rotation between said first and second drive gears to be selectively varied to thereby vary the extent of displacement of the loops of the coil of sliver relative to each other by varying the rate of relative rotation between said coiler head assembly and said coiler plate.

15. A coiler assembly as set forth in claim 14 said coiler head including calender gear means for driving said calender rolls, said calender gear means being changeable to enable the rate at which the sliver is fed by said calender rolls to be varied in such a manner as to maintain the configuration of the loops of sliver substantially constant with variations in the speed of relative rotation between said first and second drive gears.

16. A coiler assembly as set forth in claim 6 further including first bearing means for supporting said support member for rotation relative to said wall, said first bearing means including a first race on said wall on one side of said flange, a second rate on said support member and a first group of bearing elements engaging said first and second races to rotatably mount said support member on said wall and to retain said support member against axial movement relative to said wall, said coiler assembly further including a second bearing means for supporting said wall and coiler plate for rotation relative to said base means, said second bearing means including a third race on said wall on a side of said flange opposite from said one side, a fourth race on said base means and a second group of bearing elements engaging said third and fourth races to rotatably mount said coiler plate and wall on said base means and to retain said coiler plate and wall against axial movement relative to said base means.

17. A coiler assembly for using in coiling sliver within a container, said coiler assembly comprising a base, a calender roll assembly supported by said base for feeding the sliver into the container while the container is substantially stationary, a first drive means for rotating said calender roll assembly relative to both said base and container about a first axis which is offset relative to a central axis of the container to enable the sliver to form a coil having a plurality of loops as the sliver is fed into the container by said calender roll assembly, a second drive means for rotating said calender roll assembly relative to said base about a second axis which is aligned with the central axis of the container simultaneously with the rotation of said calender roll assembly about the first axis to thereby displace the loops of sliver relative to each other in the substantially stationary container, transmission means for connecting said first and second drive means with a source of power, eccentric means for varying the distance between said calender roll assembly and the second axis to enable the relationship between the calender roll assembly and the substantially stationary container to be varied to locate the periphery of loops of sliver having different thicknesses in the same relationship with the side of the substantially stationary container, a generally circular coiler plate positioned between said base and eccentric means, said eccentric means being mounted in an opening in said coiler plate and rotatable relative to said coiler plate to effect the variation in the distance between said calender roll assembly and the second axis, said coiler plate being mounted for rotation about the second axis under the influence of said second drive means, and an axially extending generally circular wall connected to said coiler plate, said second drive means including a radially outwardly extending flange connected to said wall with a first ring gear formed on a radially outermost portion of said flange, a first drive gear mounted on said base in meshing engagement with said first ring gear for rotating said first ring gear and coiler plate relative to said base about the second axis, said first drive mean including an annular support member rotatably mounted on said wall, a second ring gear formed on a radially outer portion of said support member, a second drive gear mounted on said base in meshing engagement with said second ring gear for rotating said support member relative to said flange and coiler plate, and gear means for drivingly interconnecting said support member and said calender roll assembly to rotate said calender roll assembly about said first axis upon rotation of said support member.

18. A coil assembly as set forth in claim 17 further including a generally circular support rim connected to said eccentric means in a coaxial relationship with the second axis.

19. A coil assembly as set forth in claim 17 further including first bearing means for supporting said support member for rotation relative to said wall, said first bearing means including a first race on said wall on one side of said flange, a second race on said support member and a first group of bearing elements engaging said first and second races to rotatably mount said support member on said wall and to retain said support member against axial movement relative to said wall, said coiler assembly further including a second bearing means for supporting said wall and coiler plate for rotation relative to said base, said second bearing means including a third race on said wall on a side of said flange opposite from said one side, a fourth race on said base means and a second group of bearing elements engaging said third and fourth races to rotatably mount said coiler plate and wall on said base means and to retain said coiler plate and wall against axial movement relative to said base means.

20. A coiler assembly for use in coiling sliver within a stationary container, said coiler assembly comprising a coiler head assembly including a head plate and a plurality of calender rolls mounted on said head plate for feeding sliver into the stationary container, base means for supporting said coiler head assembly above the stationary container, a coiler plate circumscribing said head plate and supported by said base means for rotation relative to the stationary container, an eccentric mounted between said coiler plate and head plate, first drive means for rotating said coiler head assembly relative to both said coiler plate and container about a first axis which is

offset relative to a central axis of the container to enable the sliver to form a coil having a plurality of loops as the sliver is fed into the container by said calender rolls, said first drive means including a first gear fixedly connected with said head plate, an idler gear mounted on said coiler plate and extending at least part way across said eccentric into meshing engagement with said first gear, and a second gear disposed in meshing engagement with said idler gear for rotating said idler gear to thereby drive said first gear to rotate said head plate and calender rolls relative to said eccentric and coiler plate, second drive means for rotating said coiler head assembly and coiler plate relative to said base means and container about a second axis which is aligned with the central axis of the container simultaneously with the rotation of said coiler head assembly about the first axis to thereby displace the loops of sliver relative to each other, means for enabling the position of said eccentric to be varied relative to said coiler plate to thereby vary the distance between the first and second axes and the relationship between said calender rolls and the container to locate the periphery of loops of sliver having different thicknesses in the same relationship with a side of the container, and means for adjusting the position of said idler gear relative to said coiler plate to maintain said idler gear in meshing engagement with said first and second gears upon a change in the position of said eccentric relative to said coiler plate.

21. A coiler assembly as set forth in claim **20** further including a circular coiler head wall fixedly connected to and extending outwardly of said head plate in a coaxial relationship with said first axis, said first gear being fixedly connected to said coiler head wall.

22. A coiler assembly as set forth in claim **21** further including a circular support wall fixedly connected to said eccentric and extending generally parallel to said coiler head wall, and bearing means operatively interconnecting said coiler head wall and said support wall for supporting said coiler head assembly for rotation relative to said eccentric and said coiler plate.

23. A coiler assembly for use in coiling sliver within a stationary container, said coiler assembly comprising a coiler head assembly including a head plate and a plurality of calender rolls mounted on said head plate for feeding sliver into the stationary container, base means for supporting said coiler head assembly above the stationary container, a coiler plate circumscribing said head plate and supported by said base means for rotation relative to the stationary container, an eccentric mounted between said coiler plate and head plate, a circular support wall fixedly connected to said eccentric and circumscribing said coiler head assembly, means for operatively connecting said coiler head assembly to said support wall and supporting said coiler head assembly for rotation relative to said support wall about a first axis offset relative to a central axis of the container, first drive means for rotating said coiler head assembly relative to both said support wall and container about the first axis to enable the sliver to form a coil having a plurality of loops as the sliver is fed into the container by said calender rolls, second drive means for rotating said coiler head assembly and coiler plate relative to said base means and container about a second axis which is aligned with the central axis of the container simultaneously with the rotation of said coiler head assembly about the first axis to thereby displace the loops of sliver relative to each other, and means for enabling the position of said eccentric and support wall to be varied relative to said coiler plate to thereby vary the distance between the first and second axes and the relationship between said calender rolls and the container to locate the periphery of loops of sliver having different thicknesses in the same relationship with a side of the container.

24. A coiler assembly as set forth in claim **23** wherein said coiler head assembly further includes a head wall fixedly connected to an outer portion of said head plate and extending generally parallel to said support wall, said coiler assembly further including means operatively interconnecting said support wall and head wall for supporting said coiler head assembly for rotation relative to said support wall about the first axis upon operation of said first drive means.

25. A coiler assembly as set forth in claim **24** further including third drive means for effecting operation of said calender rolls to feed sliver into the container, said third drive means including a ring gear fixedly connected to and located on a radially inner side of said support wall and a drive gear operatively connected with said head plate at a location radially inwardly of said head wall and extending through an opening in said head wall into meshing engagement with said ring gear to effect operation of said calender rolls at a rate which is a direct function of the rate at which said coiler head assembly is rotated relative to said support wall by said first drive means.

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