

Sept. 5, 1967

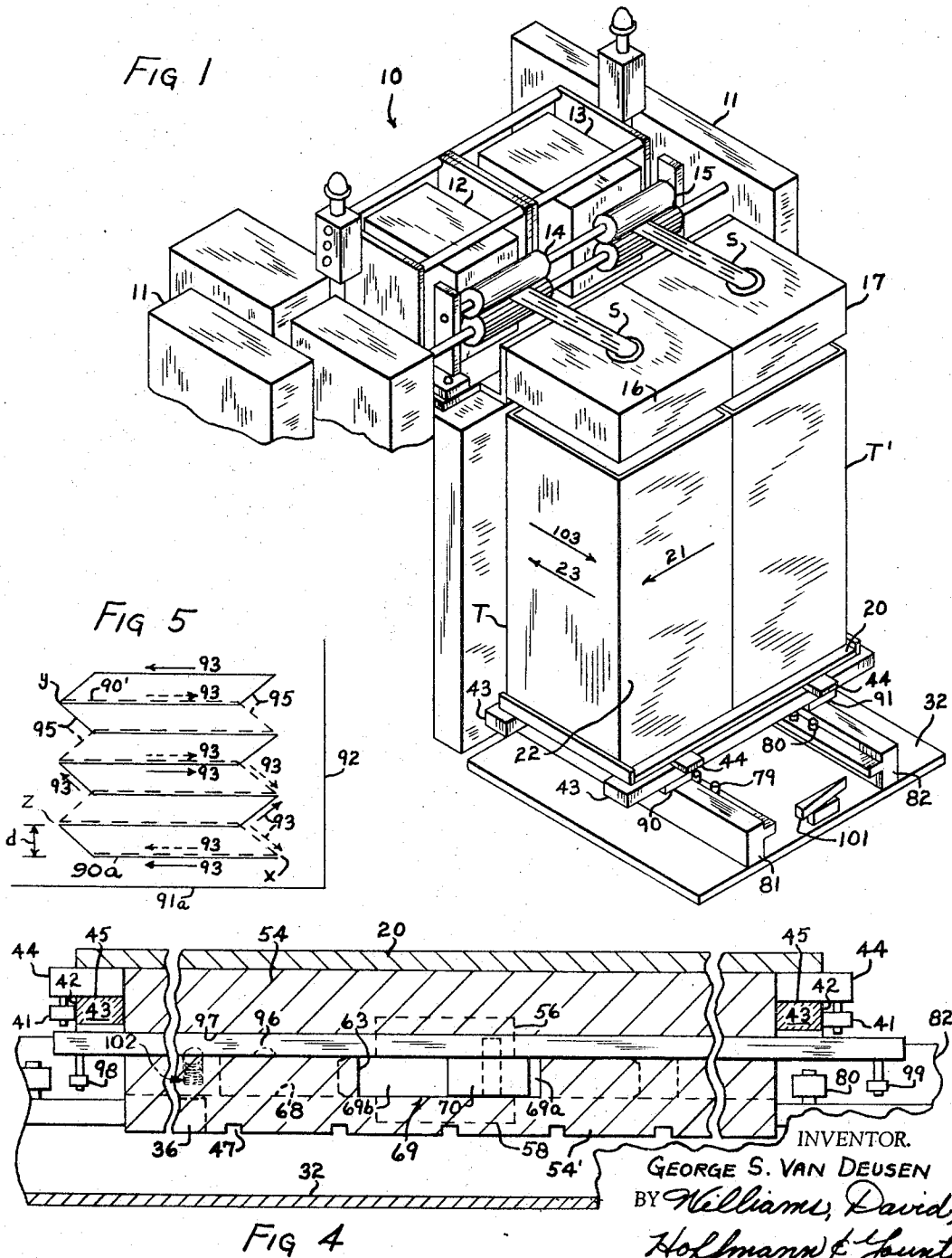
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APPARATUS FOR PACKING SLIVER

Filed June 19, 1962

2 Sheets-Sheet 1



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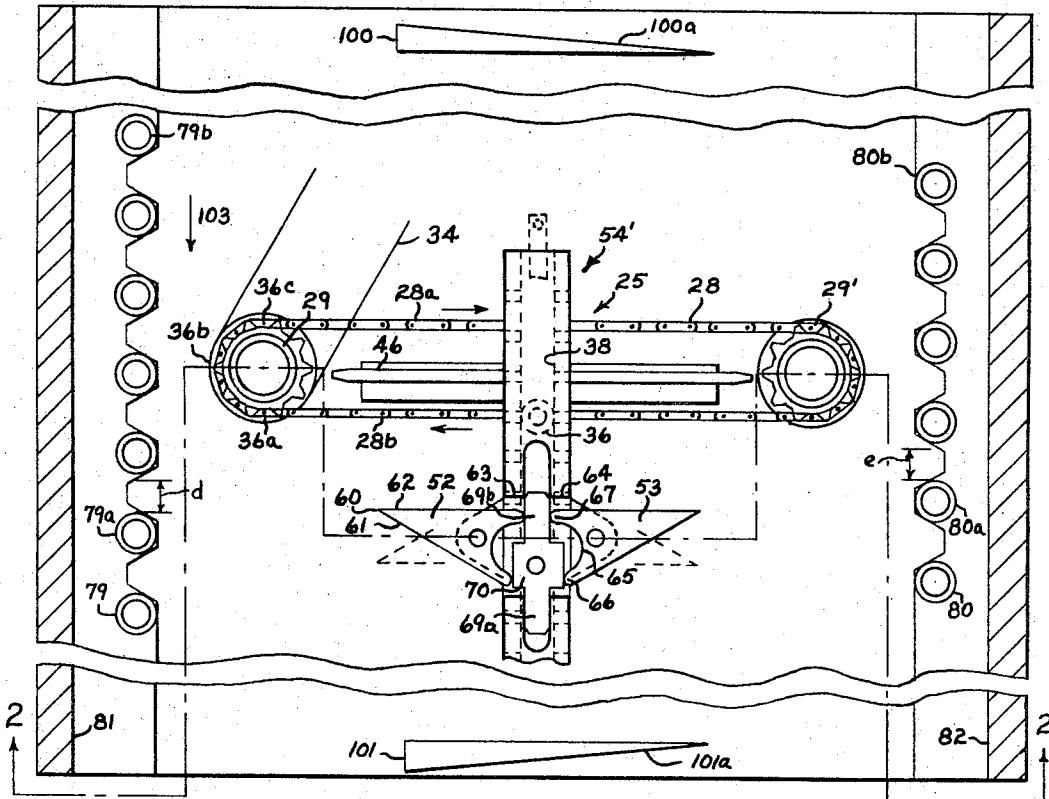


FIG 3

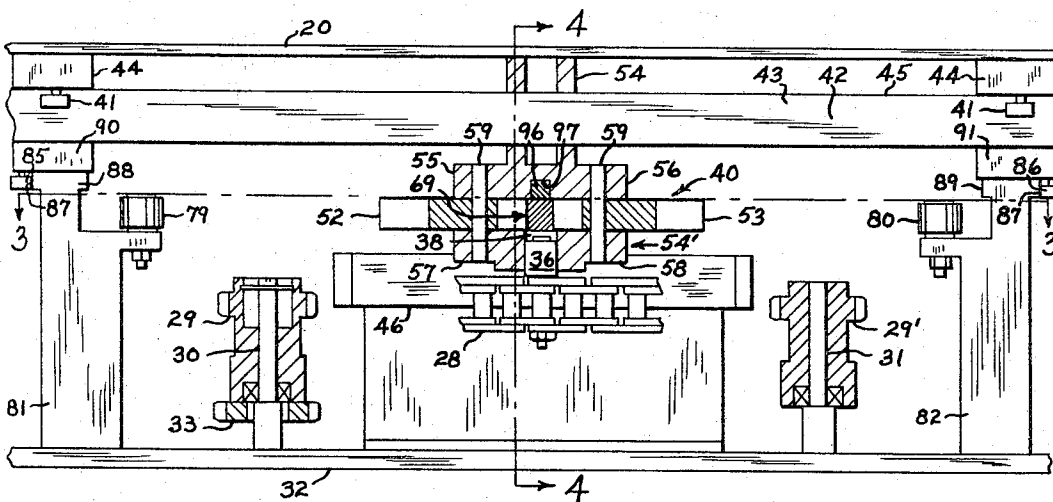


FIG 2

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3,339,244

APPARATUS FOR PACKING SLIVER

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Filed June 19, 1962, Ser. No. 203,527
8 Claims. (Cl. 19—160)

The present invention relates to a method and apparatus for packing continuously fed strip material in containers and particularly to a method and apparatus for packing sliver in containers.

The principal object of the present invention is the provision of a new and improved method and apparatus for packing continuously fed strip material in a container which provide for the arrangement of a large amount of material in the container in a manner which permits smooth, uniform removal of the material from the container without tangling or interlocking of the strip material.

A further object of the present invention is the provision of a new and improved method and apparatus for packing continuously fed fibrous material in layers in a container wherein each layer comprises a plurality of partially overlapped rows of material formed by moving the container sidewise to place rows of material in the container and indexing the container forward at the end of each sidewise movement and while the container is moving sidewise.

A further object of the present invention is the provision of a new and improved method and apparatus for packing continuously fed coiled sliver in layers in a container having a rectangular cross section wherein each layer of material substantially fills the cross section of the container and comprises a plurality of rows of coiled sliver which extend parallel to one side of the container and partially overlap each other so that the sliver fibers in adjacent rows and layers cross thereby preventing interlock of the fibers in adjacent rows or layers and insuring smooth, uniform removal of the sliver from the container.

A further object of the present invention is the provision of a new and improved method and apparatus for packing continuously fed strip material in layers in a rectangular container mounted on a transfer table which is moved relative to the strip material in different directions, the table being moved in one direction to form a row of strip material in the container and being indexed in a second direction at the end of its movement in the one direction a distance, as measured on a line perpendicular to said first direction of movement, not greater than substantially the width of said first row of material and being moved in a third direction opposite said first direction to form a second row of material adjacent to or overlapping the first row, depending upon the distance the table moves in the second direction.

A further object of the present invention is the provision of a new and improved apparatus for packing continuously fed strip material in a rectangular container mounted on a transfer table, as noted in the next preceding object, wherein the aforementioned movements continue until the cross section of the container is completely filled and are then automatically repeated to place a second layer of material on the first layer with the first row of material forming the second layer overlapping the last row of material positioned in the container forming the first layer.

A further object of the present invention is the provision of a new and improved apparatus having a drive means for moving a transfer table in parallel first and second opposite directions and indexing means for moving the table in third and fourth opposite directions perpendicular

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to the first and second opposite directions wherein the indexing means and drive means operate simultaneously and the resultant indexing movement of the table is in a predetermined resultant path, the drive means including means for reciprocating the table in the first and second opposite directions and the indexing means including a first cam means movable in timed relation to the table and operatively connected thereto and first and second parallel spaced rows of stationary cam members, wherein the first one of the cam members in the first row engages the first cam means when the table is first moved in the first direction and the first one of the cam members in the second row engages the first cam means when the table first moves in the second direction and wherein the second cam member in the first row engages the first cam means upon a second movement of the table in the first direction, and the second cam member in the second row, likewise, engages the first cam means upon movement of the table a second time in the second direction, and the subsequent cam members in each row engage the first cam means upon subsequent movements of the table as above described.

Further objects and advantages of the present invention will be apparent to those skilled in the art to which it relates from the following detailed description of the preferred embodiment thereof made with reference to the following drawings in which:

FIG. 1 is a perspective view of an apparatus embodying the present invention;

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

FIG. 3 is a sectional view taken approximately on the section line 3—3 of FIG. 2;

FIG. 4 is a sectional view taken approximately on the section line 4—4 of FIG. 2; and

FIG. 5 is a graph illustrating the path of movement of the transfer table of the apparatus shown in FIG. 1.

The present invention is preferably embodied in a sliver handling mechanism designated generally by the reference numeral 10. The mechanism 10 includes side columns 11 supporting gill boxes 12, 13 which may be of conventional construction and include faller bars for operating on the sliver S drawn therethrough by draft roll mechanisms 14, 15, respectively. The draft roll mechanisms 14, 15 deliver the sliver to coiler heads 16, 17, respectively. The coiler heads 16, 17 are of conventional construction and are operative to lay the sliver down in a coil or loop. The coiled sliver is delivered from the coiler heads 16, 17 to rectangular shape containers T, T', respectively, which are mounted beneath the coiler heads 16, 17 on a movable support or transfer table 20.

The sliver is continuously delivered from the coiling heads 16, 17 to the containers being filled at a substantially constant predetermined speed. While the drawings show two coiler heads operative to simultaneously deliver sliver to two different containers supported by the transfer table 20, one or any number of containers may be supported by the transfer table to receive sliver from a corresponding number of coiler heads, and the invention will be described with reference only to the filling of container T, it being understood that the description would be the same for the filling of any container on the transfer table 20.

When container T is to be filled, it is positioned on transfer table 20 relative to the coiler head 16 so that the coiled sliver initially delivered to the container is received in one corner of the container. The transfer table 20 is then moved linearly relative to the coiler head in a sidewise direction, as generally indicated by arrow 21 parallel to the end wall 22 of the container T, as the coils of sliver are being laid down by the coiler head, a

distance sufficient to form a row of coiled sliver lying adjacent the end wall 22 of the container.

The table 20 and container T are indexed forwardly at the end of the above noted sidewise movement in a direction generally indicated by arrow 23 a predetermined distance which preferably, as measured on a line perpendicular to the direction of the sidewise movement, is substantially less than the diameter of a coil of sliver being delivered to the container. The table 20 then moves the container T in a sidewise direction parallel to the end wall 22 but opposite the direction indicated by the arrow 21 to lay a second row of coiled sliver in the container overlapping the first row. At the end of each sidewise traversing movement the container is shifted forward so that upon the subsequent sidewise traversing movement thereof another row of coiled sliver is laid in the container to partially overlap the row previously laid in the container. This movement of the container continues until a first layer of sliver has been formed in the container substantially filling the cross section thereof. A second layer is then placed on the first layer by automatically repeating the above operations, and additional layers of coiled sliver are likewise placed in the container until the container is completely filled.

The transfer table 20 is provided with a drive mechanism 25 therefore which moves the transfer table 20 in a manner so as to move the container supported thereby as above described. The drive mechanism 25 includes a drive member or endless chain 28 for moving the transfer table in the aforementioned sidewise directions parallel to the end wall 22 of the container. The endless chain 28 is trained around spaced sprockets 29 and 29' which are rotatably mounted on shafts 30, 31, respectively, which extend vertically from a base plate 32. The sprocket 29 is formed on a common hub with a sprocket 33 and a chain 34 is trained around sprocket 33 and driven by a suitable motor, not shown, causing the sprockets 33 and 29 to rotate and drive the chain 28.

The chain 28 has runs 28a, 28b, which move in opposite directions as indicated by the arrows in FIG. 3, and a suitable drive connection connects the chain 28 and table 20 so that the table 20 moves with the chain 28. The drive connection in the illustrated embodiment includes a rotatable roller 36 projecting vertically from the chain 28 and suitably secured thereto. The roller 36 is shown in FIG. 3 secured to the portion of the chain on run 28b, and it should be apparent that as the chain 28 is driven the roller 36 will move with the chain 28 around each sprocket 29, 29' and along each run 28a, 28b.

The roller 36 is positioned snugly in a slot 38 in an elongated bar member 40 which is suitably secured to the underside of transfer table 20 and the roller 36 is free to roll in the slot 38. The bar member 40 extends in a direction substantially perpendicular to the direction of movement of the runs of the chain 28 and the slot 38 therein also extends in a direction substantially perpendicular to the direction of movement of the runs 28a, 28b. The roller 36 bears against the walls of the slot 38 and moves the bar 40 and transfer table 20 connected thereto as the roller moves.

When roller 36 moves along run 28b toward point 36a, the roller 36 bears or pushes on the left side of the slot 38 causing the bar 40 and the transfer table 20 connected thereto to move to the left, as viewed in FIG. 3, at a speed substantially equal to the speed of chain 28. Movement of the roller 36 from point 36a to point 36b causes the roller to roll in the slot 38 as well as move the transfer table to the left at a decelerating speed until movement of the table toward the left ceases. Movement to the left ceases approximately when roller 36 reaches point 36b. Movement of the roller 36 from point 36b to point 36c causes the roller to roll in the slot 38 as well as bear against the right side of the slot 38, moving the table 20 in a direction to the right as viewed in FIG. 3 at an accelerating speed. Movement of the roller 36 along run

28a causes the roller to bear against the right side of slot 38, thus moving the table 20 to the right as viewed in FIG. 3 at substantially the speed of the chain 28. Movement of the roller 36 around sprocket 29' causes movement of the transfer table 20 which is substantially identical to the movement thereof when roller 36 moves around sprocket 29, as described above.

The transfer table 20 is supported for movement, by roller 36, in a linear path parallel to the end wall 22 of the container and is guided in the linear path by rollers 41 which engage way surfaces 42 on suitable spaced frame members 43 which support table 20 and extend in a direction parallel to the direction of the sidewise movement. The table 20 has spaced frame members 44 fixed to the underside thereof which extend between frame members 43 and rest on the top surfaces 45 of the frame members 43 and when the table 20 is moved by roller 36 the frame members 44 slide on the top surfaces 45 of frame members 43 and the rollers 41 connected to frame members 44 roll on the way surfaces 42. Thus, the rollers 41 constitute a means for insuring that the table 20 moves in a linear path parallel to end wall 22 of the container.

A guide member 46 is provided to guide the movement of the bar 40 fixed to the table 20 as the bar is moved along runs 28a, 28b by the roller 36. The guide member 46 comprises a suitable elongated guide element extending vertically from base plate 32 into a position between the runs 28a, 28b of the chain 28 and extending parallel thereto between sprockets 29, 29'. The bar member 40 is provided on its underside with a plurality of spaced slots 47, shown in FIG. 4, and as the bar member 40 moves with the chain 28, the guide member 46 is received in one of the slots 47 and assists in insuring that the table 20 is moved in a straight linear path by the roller 36 moving along runs 28a, 28b.

At the end of each sidewise movement of the table 20 in a direction parallel to the end wall 22 of the container, the table is shifted or indexed forward in a direction as generally indicated by the arrow 23, as aforementioned. A suitable indexing means is provided to so move the table 20 and includes a cam means comprising generally triangular shaped cams 52, 53, supported by the bar member 40 and movable with the table 20.

The bar member 40 comprises two elongated members 54 and 54'. The elongated member 54 is secured to the underside of the table 20 and is provided intermediate its ends with projecting ear portions 55, 56 extending outwardly from opposite sides of the member 54. The elongated member 54' is suitably secured to the member 54 and the slot 38 is formed therein with the slot 38 opening downwardly to receive roller 36. The elongated member 54' is provided with projecting ear portions 57, 58 which extend outwardly from the opposite sides thereof and are spaced from and located beneath the ear portions 55, 56, respectively.

The cam members 52 and 53 are positioned between the ear members 55, 57 and 56, 58, respectively, and are pivotally secured therebetween by suitable pivot pins 59. The cam members 52, 53 are generally triangular in shape, as above mentioned, and have their apexes 60 disposed outwardly from the bar member 40. The cam members 52, 53 are provided with cam surfaces 61, 62, which function in a manner to be described hereinbelow and diverge from the apexes 60 of the cam members 52, 53 toward bar 40. The base portion of the cam members 52, 53 remote from the apexes 60 thereof extend through slots 63, 64, respectively, in the bar member 40. The base portion of each of the cam members 52, 53 has an arcuate recess opening into the base edge so that the edge surface of the base portion includes a centrally located concave portion 65. Curved convex cam portions 66, 67 of the cam members 52, 53 connect the concave portion 65 with the corresponding cam surfaces 61, 62, respectively.

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The bar member 40 is provided with a slot 68 having a cam actuating member 69 positioned therein. The cam actuating member 69 is movable in the slot 68 and comprises two bar portions 69a, 69b extending in opposite directions from an enlarged cam flipping or actuating portion 70. The actuating portion 70 is positioned between the cams 52, 53 and upon movement thereof is adapted to engage the convex cam portions 66, 67, depending upon the direction of movement thereof. Movement of the cam actuating member 69 upwardly, as viewed in FIG. 3, causes the actuating portion 70 to engage the convex portions 67 of the cam members 52, 53, respectively, and pivot the cam members about pivot pins 59 into the dot-dash position illustrated in FIG. 3. When in this position, illustrated in dot-dash lines in FIG. 3, the convex cam surfaces 66 engage the lower bar portions 69a of the cam actuating member while the convex portions 67 engage the actuating portion 70, thus holding the cams 52, 53 in the position to which they are moved. When the cam actuating member 69 is in the position illustrated in full lines the cam actuating portion 70 engages the convex portions 66 of the cam members 52, 53 and the convex portions 67 engage the bar portion 69b of cam actuating member 69.

The cam members 52, 53 cause the aforementioned shifting or indexing motion of the transfer table 20 in cooperation with two spaced parallel rows of stationary cam members or rollers 79, 80 positioned on supports 81, 82, respectively, extending vertically from the support plate 32. The plurality of rollers 79 and 80 are positioned on the supports 81, 82, respectively, and there is one roller more on support 81 than on support 82 for a purpose to be described hereinbelow. When the cams 52, 53 are in the position shown in full lines in FIG. 3, the cam surface 61 of the cam member 52 engages roller 79a when the cam 52 moves to the left a sufficient distance. As the cam 52 continues to move to the left after engaging roller 79a, the cam surface 61 and the roller 79a operate to shift the cam 52 and bar 40 forwardly. Since the bar 40 is secured to table 20, the table 20 is likewise shifted forwardly. The table 20 and cam 52 are shifted forwardly a distance d , as designated in FIGS. 3 and 5, as measured on a line perpendicular to the direction of the sidewise movement. This distance as aforementioned is preferably less than the diameter of a coil of sliver delivered to the container to provide overlapping thereof. The cams 52, 53 are then moved to the right as the table moves to the right and cam surface 61 of cam 53 engages a roller 80a and operates therewith to index the table 20 forwardly another step, the distance designated e in FIGS. 3 and 5. It should be apparent that the rollers 79 and 80 are spaced apart and that the rollers 80 are staggered relative to rollers 79, that is, rollers 80 are supported by support 82 opposite the spaces between rollers 79. The spacing of these rollers is sufficient to provide the desired amount of shifting movement.

As is apparent from FIG. 3, the bar member 40 is disengaged from the guide member 46 during movement of the roller 36 around the sprocket wheel 29 and during which time the indexing movement of the table 20 occurs. After the table 20 is indexed and begins to move sideways in a reverse direction, the guide member 46 will be received in the next adjacent slot 47 of the bar member 40 to guide the latter during its reverse movement and insure that the table is moved in a straight linear path by the roller 36 during its movement in a reverse direction.

The transfer table 20 when shifted forwardly by the action of cams 52, 53 and rollers 79, 80, respectively, is guided by rollers 85, 86, which engage way surfaces 87 on suitable spaced frame members 88, 89. The frame members 88, 89 are supported by support members 81, 82, respectively. The rollers 85, 86 are mounted on spaced frame members 90, 91, respectively, and the frame members 90, 91 rest on the top surfaces of the frame

members 88, 89, respectively, and extend coextensively therewith, and the frame members 90, 91 support frame members 43 which, as aforementioned, support the table 20.

It should be apparent from the above description that the present invention provides a table 20 which moves in a sidewise direction and is guided in this movement by rollers 41 engaging way surfaces 42, and which is indexed forwardly by the action of the stationary cams 79, 80 and movable cams 52, 53. The indexing movement is transmitted to the table 20 through bar 40 and to frame members 90, 91 through rollers 41 and frame members 43 which are secured to frame members 90, 91.

Moreover, it should be apparent that as the roller 36 moves from approximately point 36a to point 36b the cam 52 engages and operates with a roller 79. Movement of the roller 36 tends to move the table 20 sidewise while the engagement of cam 52 and roller 79 tends to move the table 20 forwardly. As a result of this simultaneous action the table 20 is moved in a linear path which is the result of the above described simultaneous actions.

The movement of the table 20 can best be visualized from FIG. 5, which schematically illustrates in graph form the path of movement through which a point on the table 20 moves while the container thereon receives material. The full line 90a designates the path of movement while the container receives the first layer and the dash line 90' designates the path of movement when the container receives the second layer of material. Lines 90a, 90' are obtained by plotting the distance of a point on the table 20 at a given time from a given horizontal reference line 91a, against the distance of that point at the same time from a reference line 92 perpendicular to line 91a. The point x indicates the starting point for receiving the first layer of material and the arrows 93 indicate the direction of movement of the table. The portions 95 of the lines 90a, 90' illustrate the aforementioned resultant paths of movement. The sidewise movement and the shifting movement of the table 20 continues as above described and the last roller 80b shifts table 20 forwardly so that the container T can receive its last row of material in the first layer upon sidewise movement. When the table 20 reaches the end of this sidewise movement it is shifted in the direction of arrow 103 by roller 79b which cooperates with cam surface 62 of cam 52. Thus the table 20 is moved in a reverse direction and the first row of material forming the second layer is placed in the container overlapping the last row in the first layer. The point y indicates the beginning point for receiving the second layer of material and point z designates the beginning point for receiving the third layer of material. The horizontal dash lines in FIG. 5 forming lines 90' are actually coextensive with the horizontal portions of lines 90a, but for purposes of illustration are shown adjacent thereto.

The cams 52, 53 are pivoted about pivot pins 59 as the last row of material in the first layer is placed in the container so that the table 20 is indexed in the direction of arrow 103 at the end of the sidewise movement thereof. The cams 52, 53 are pivoted about the pivot pins 59 by the cam actuating member 69. The cam actuating member 69 is suitably secured to a rod member 96, which is positioned in a slot 97 in bar member 40. The rod member 96 extends beyond the bar member 40 at its opposite ends. Suitable cam follower means 98, 99 are mounted on the opposite ends of the bar member 96 and are adapted to engage stationary cam members 100, 101, respectively, supported by the support plate 32. The cam followers 98, 99 are adapted to engage the cam surfaces 100a, 101a, respectively, as the rod member 96 is moved sideways with the transfer table 20 during the forming of the last row of a layer. Engagement of the cam follower 98 with the cam surface 100a causes movement of the rod member 96 in a direction towards the left, as viewed in FIG.

4. Such movement of the rod member causes the cam actuating portion 70 to be moved therewith and when so moved the cam actuating portion 70 engages the convex portions 67 of the cam members 52, 53 and pivots the cam members about their respective pivot pins 59 into the position illustrated by dot-dash lines in FIG. 3. Suitable detent means 102 is provided to hold the rod member 96 in the position to which it is moved. The detent means 102 comprises a spring biased ball positioned in an opening in member 54' and biased by a suitable spring to engage and be received in one of two cavities in rod member 96, depending upon the position thereof.

As the last row of material forming the first layer is placed in the container the cams 52, 53 are pivoted as aforementioned, and cam surface 62 of cam 52 engages the surface of the roller 79b. The roller 79b and the cam 52 operate in a manner as above described in relation to cam surface 61 to cause the table 20 to be shifted in the general direction indicated by the arrow 103 in FIGS. 1 and 3. This direction, of course, will be opposite to the direction indicated by arrow 23, shown in FIG. 1. The transfer table will then be moved towards the right, as viewed in FIGURE 3, placing the first row of material forming the second layer in the container and the cam 52 will cooperate with the roller 80b to cause the aforementioned shifting movement of the table 20. These operations will continue until the second layer of material is completely formed. As the last row of material forming the second layer of material is placed in the container the cams 52, 53 are pivoted and the first row of material forming the third layer of material overlaps the last row in the second layer placed thereon. The cams are pivoted by cam 101 and cam follower 99 which actuate the cam actuating means 69 to pivot the cams 52, 53 into the full line position shown in FIGURE 3 and the third layer of material is placed in the container in substantially the same manner as above described with respect to the first layer of material. Additional layers of material are placed in the container until the container has been completely filled. When the container is completely filled the container is removed from table 20 and an empty container placed thereon for filling in the above described manner.

While the preferred embodiment of the present invention has been described in considerable detail, it is my intention to hereby cover all modifications, constructions and arrangements thereof which fall within the ability of those skilled in the art and within the scope and spirit of the appended claims.

Having described my invention, I claim:

1. An apparatus for packing continuously fed sliver in a container comprising a transfer table for supporting the container, a coiling head for coiling the sliver and delivering the coiled sliver to the container, drive means for moving the transfer table in a sidewise first direction relative to the coiling head to form a row of coiled sliver in the container, intermittently actuated indexing means for moving the transfer table in a second direction at the end of said sidewise movement a distance as measured on a line substantially perpendicular to said first direction of movement not greater than substantially the diameter of a coil of said sliver, said drive means moving said transfer table in a third direction opposite and parallel to said first direction to form a second row of coiled sliver in the container.

2. An apparatus for packing continuously fed sliver in a container comprising a transfer table for supporting the container, a coiling head for coiling the sliver and delivering the coiled sliver to the container, drive means for moving the transfer table in a first sidewise direction and then in a second direction opposite to said first direction relative to the coiling head to form rows of coiled sliver in the container, intermittently actuated indexing means including cooperably engageable means for moving the transfer table in a linear path angularly related

to said first and second directions beginning at the end of said first sidewise movement a distance as measured on a line substantially perpendicular to said first direction of movement less than the diameter of a coil of said sliver, said drive means moving said transfer table in said second direction opposite and parallel to said first direction to form a second row of coiled sliver in the container which partially overlaps said first row.

3. An apparatus for packing continuously fed sliver in a container comprising a transfer table for supporting the container, a coiling head for coiling the sliver and delivering the coiled sliver to the container, drive means for moving the transfer table in a first direction relative to said coiling head to form a row of coiled sliver in the container, intermittently actuated indexing means including cooperably engageable elements for indexing the transfer table in a second direction perpendicular to said first direction while said table is being moved during the latter portion of its movement in said first direction, said table being moved in a predetermined path which is the resultant of the simultaneous operation of said drive means and said indexing means a distance as measured on a line substantially perpendicular to said first direction of movement not greater than substantially the diameter of a coil of said sliver, said drive means moving said transfer table in a third direction opposite and parallel to said first direction to form a second row of coiled sliver in the container adjacent said first row.

4. An apparatus as defined in claim 3 wherein said drive means comprises a chain member connected to said table for moving said table.

5. An apparatus for packing continuously fed sliver in a plurality of layers in a container wherein each layer is formed of a plurality of rows of coiled sliver comprising a transfer table for supporting the container, a coiling head for coiling the sliver and delivering the coiled sliver to the container, drive means for moving the transfer table in a first direction relative to said coiling head to form a row of coil sliver in the container, indexing means for moving the transfer table in a second direction substantially perpendicular to said first direction while said table is moving in said first direction including first cam means movable with said transfer table and having first and second cam surfaces and second stationary cam means operatively engaging said first cam surface while said first cam means moves with said table for moving said transfer table in said second direction, said table being moved in a predetermined path as a result of the simultaneous operation of said drive means and said indexing means, said drive means moving said transfer table in a third direction opposite said first direction to form a second row of coiled sliver in the container adjacent said first row, means pivotally mounting said first cam means relative to said transfer table and means for pivoting said first cam means to cause said second cam surface to engage said second cam means to index said transfer table in a fourth direction opposite said second direction while receiving a second layer of material.

6. An apparatus as defined in claim 5 wherein said means for pivoting said first cam means comprises a cam member and a cam actuator means operated by said cam member so that the first row of material forming the second layer overlaps the last row of material forming the first layer.

7. An apparatus for packing continuously fed sliver in a container comprising a transfer table for supporting the container, a coiling head for coiling the sliver and delivering the coiled sliver to the container, drive means for moving the transfer table in a first direction relative to said coiling head to form a row of coiled sliver in the container, indexing means for indexing the transfer table in a second direction perpendicular to said first direction while said table is moving in said first direction, said indexing means comprising a first cam means movable

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with said table and second stationary cam means which engages said first cam means and operates therewith upon movement of said first cam means with said table, said table being moved in a predetermined path which is the resultant of the simultaneous operation of said drive means and said indexing means a distance as measured on a line substantially perpendicular to said first direction of movement not greater than substantially the diameter of a coil of said sliver, said drive means moving said transfer table in a third direction opposite said first direction to form a second row of coiled sliver in the container adjacent said first row.

8. An apparatus for packing continuously fed sliver in a container comprising a transfer table for supporting the container, a coiling head for coiling the sliver and delivering the coiled sliver to the container, drive means including a chain member connected to said table for moving the transfer table in a first direction relative to said coiling head to form a row of coiled sliver in the container, indexing means for indexing the transfer table in a second direction perpendicular to said first direction while said table is moving in said first direction, said indexing means comprising a first cam means movable with said table and second stationary cam means which engages said first cam means and operates therewith upon movement of said first cam means with said table, said table being moved in a predetermined path which is the

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resultant of the simultaneous operation of said drive means and said indexing means a distance as measured on a line substantially perpendicular to said first direction of movement not greater than substantially the diameter of a coil of said sliver, said drive means moving said transfer table in a third direction opposite said first direction to form a second row of coiled sliver in the container adjacent said first row.

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