

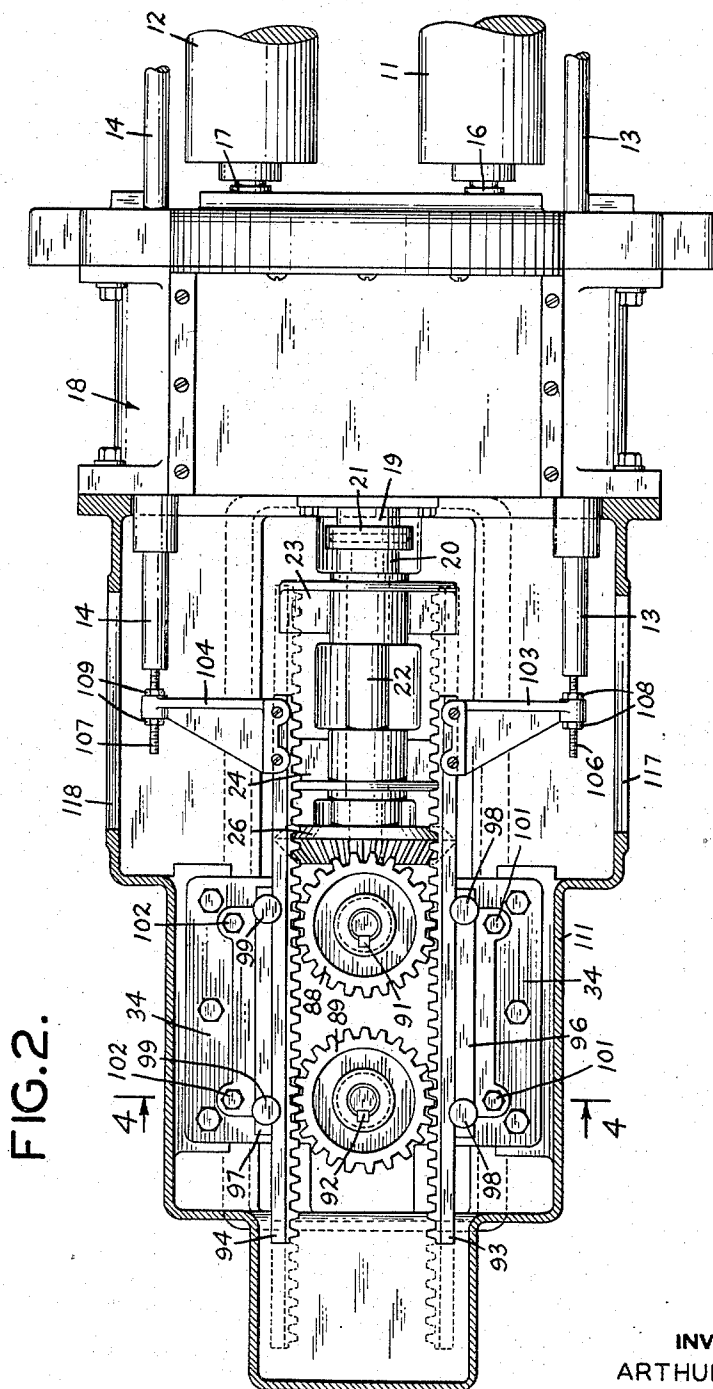
Oct. 17, 1950

A. MEDER
REVERSING MECHANISM

2,525,929

Filed July 13, 1948

3 Sheets-Sheet 2



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3 Sheets-Sheet 3

FIG. 3.

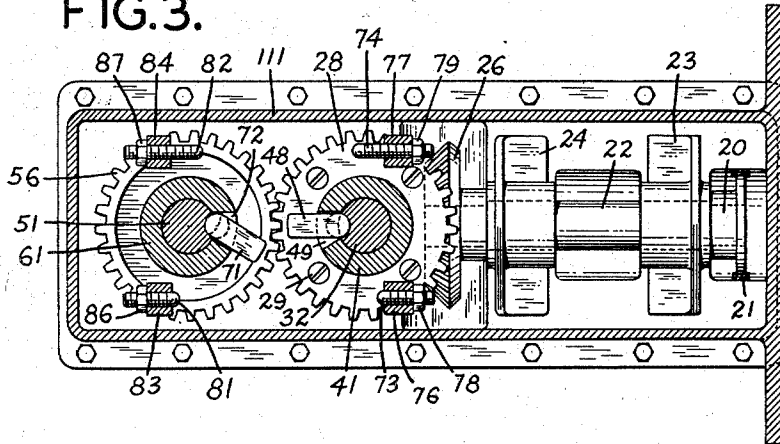
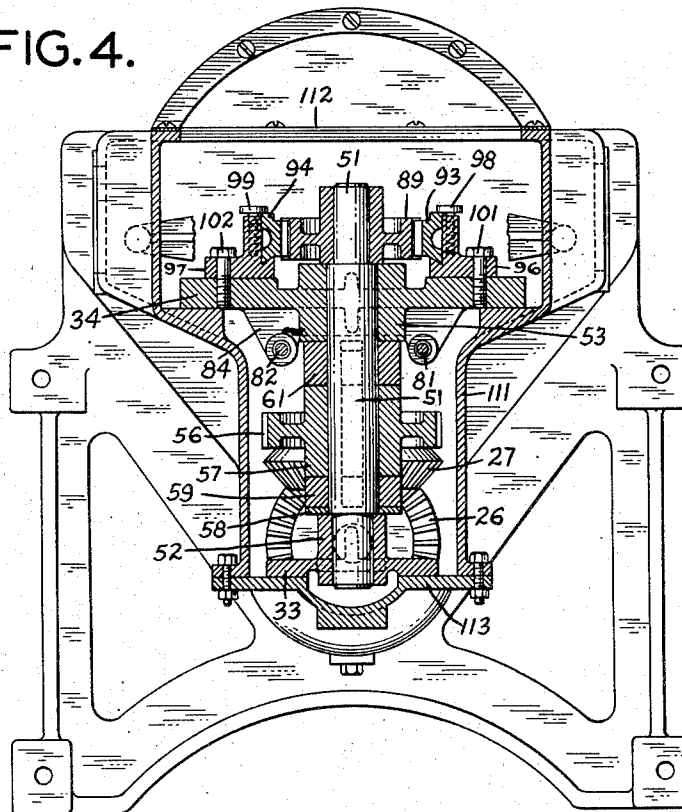


FIG. 4.



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REVERSING MECHANISM

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5 Claims. (Cl. 74—34)

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This invention relates to a reversing mechanism and relates more particularly to a reversing mechanism adapted for use with textile winding apparatus.

In the production of cheeses, pirns and other yarn packages it is necessary to guide the yarn back and forth along the length of the package during the winding operation. Various camming arrangements have been proposed to actuate the yarn guide means, but the cams in all of them have been subject to uneven wear since the force required to reverse the yarn guide means at each end of its stroke is greater than the force required to move the yarn guide means in one direction. It has not been feasible to adjust the cam follower to compensate for the wear on the cam, because the wear is localized at a few points, with the result that frequent replacement of the cams has been necessary. Cam replacement involves a considerable expense as the cams employed are not standardized and must be manufactured specially for each application. Moreover, the winding machine must be shut down during cam replacement, entailing still further loss.

It is an important object of this invention to provide a novel reversing mechanism which will be free from the foregoing and other disadvantages and which will be especially simple in construction and efficient in use.

A further object of this invention is to provide a novel reversing mechanism constructed of relatively simple mechanical elements which will not be subject to uneven wear.

Other objects of this invention, together with details of construction and arrangement of parts, will be apparent from the following detailed description and claims.

In the accompanying drawings wherein a preferred embodiment of my invention is shown,

Fig. 1 is a vertical sectional view of the reversing mechanism.

Fig. 2 is a plan view of the reversing mechanism, with the cover removed,

Fig. 3 is a sectional view taken on line 3—3 in Fig. 1 showing the driving gears and keys,

Fig. 4 is a sectional view taken on line 4—4 in Fig. 2, and

Fig. 5 is an exploded detail view of the keying means.

Referring now to the drawings for a detailed description of this invention, the reversing mechanism is shown as it is applied to a twister-cheeser for simultaneously winding two rows of cheeses by cork-rolls 11 and 12, employing trav-

erse bars 13 and 14 for supporting and traversing any suitable yarn guide means as is well understood in the art. Ends 16 and 17 of the cork rolls 11 and 12, driven by any suitable means (not shown) are journaled in a gear box, indicated generally by reference numeral 18. Suitable gearing in said gear box 18 driven by cork roll 12 drives a pulley 19 which in turn drives a pulley 20 by means of a belt 21, thereby rotating shaft 22, which is suitably supported in bearing blocks 23 and 24. Fastened to the end of shaft 22 is a bevel gear 26, which meshes with and drives a bevel gear 27 having fastened thereto a ring gear 28 by means of screws 29. A hub 31 integral with the bevel gear 27 extends through the ring gear 28 and acts as a bearing for mounting the assembled gears for free rotation on shaft 32. The shaft 32 is rotatably supported by lower plate 33 and upper plate 34 in bearings 36 and 37 respectively.

The assembly comprising the bevel gear 27 and the ring gear 28 is spaced from the bearing 36 by means of a washer 38 and a collar 39 and from the bearings 37 by means of a collar 41 all mounted on the shaft 32. A key 42 having a limited angular rotation, as will hereinafter appear, is mounted in a keyway 43 in the shaft 32 and a keyway 44 in the hub 31 of the bevel gear 27. The lower portion of the key 42 passes through a keyway 46 in the collar 39 and bears against the washer 38, whereas the upper portion of the key 42 passes through a keyway 47 in the collar 41 and has integral therewith a finger 48 extending at right angles thereto which passes through an opening 49 in the collar 41. Between the ends of the key 42 there is a cut-out portion 50 which is somewhat longer than the hub 31 of the bevel gear 27 permitting the bevel gear 27 to rotate freely about the shaft 32 when the key 42 is in the position shown in the drawing. Angular rotation of the key 42 will lock the hub 31 of the bevel gear 27 to the shaft 32 and transmit a driving force between them, as will be described in greater particularity below.

A shaft 51 is mounted parallel to the shaft 32 and is supported in bearings 52 and 53 in the plates 33 and 34 respectively. The shaft 51 carries a gear 56 which meshes with and is driven by the ring gear 28. The gear 56 has integral therewith a hub 57 mounted for free rotation about the shaft 51, the hub being spaced from the bearing 52 by a washer 58 and a collar 59 and from the bearing 53 by a collar 61. A key 63 identical with the key 42 is mounted in

a keyway 64 in the shaft 51 and in a keyway 66 in the hub 57 of the gear 56, and like the key 42 is provided with a cut-out portion 67 somewhat longer than the hub 57 of the gear 56. The lower end of the key 63 passes through a keyway 68 in the collar 59 and bears against the washer 58, whereas the upper end of the key 63 passes through a keyway 69 in the collar 61 and is provided with a finger 71 extending at right angles thereto which passes through an opening 72 in the collar 61. The key 63 will furnish a driving connection between the gear 45 and the shaft 51 when it is in the position shown in the drawing. Angular rotation of the key 63 to a neutral position such as that occupied by the key 42 will break the driving connection between the gear 56 and the shaft 51 and permit them to rotate freely relative to each other as will be shown below.

Adjustable stops 73 and 74 are provided on each side of the shaft 32 and are positioned to strike the finger 48 of the key 42 and rotate the key from the neutral position to the driving position and back again. The stops 73 and 74 are threaded through brackets 75 and 77 depending from the plate 34 and carry lock-nuts 78 and 79 to hold them in any adjusted position. Similar stops 81 and 82 are provided on each side of the shaft 51 in a position to strike the finger 71 of the key 63 and rotate the key from the driving position to the neutral position and back again, being threaded through the brackets 83 and 84 depending from the plate 34. Like the adjustable stops 73 and 74 the adjustable stops 81 and 82 carry lock-nuts 85 and 87.

Mounted on the upper end of the shafts 32 and 51 are pinions 88 and 89 which are keyed to their respective shafts by means of keys 91 and 92. The pinions 88 and 89 drive racks 93 and 94 which are slidably supported on blocks 96 and 97 and are held in place on the blocks by means of bolts 98 and 99. The blocks 96 and 97 are fastened in turn to the plate 34 by means of bolts 101 and 102. Brackets 103 and 104 carried by each of the racks 93 and 94 are provided with threaded rods 106 and 107 which engage and drive the traverse bars 13 and 14. The rods 106 and 107 are held in position by lock nuts 108 and 109 which permit the position of the stroke of the traverse bars 13 and 14 to be adjusted as desired.

The entire reversing mechanism is enclosed in a casing 111 having a cover 112 and a bottom plate 113. An oil sump 114 and a drain plug 116 are provided in the bottom plate, and during operation of the reversing mechanism a level of oil is maintained within the casing 111 to provide effective lubrication for all the moving parts. Hand holes 117 and 118 in the casing permit adjustment of the position of the rods 106 and 107 without the necessity of removing the cover 112.

The reversing mechanism is shown in the drawings with the key 42 in the neutral position between the gear 27 and the shaft 32 and with the key 63 in the driving position between the gear 56 and the shaft 51. In operation, with the bevel gear 27 and the ring gear 28 rotating freely about the shaft 32 in a counter-clockwise direction as viewed from above, the gear 56 and the shaft 51 will be driven clockwise carrying the rack 93 and the traverse bar 13 to the left and the rack 94 and the traverse bar 14 to the right. The motion of the racks 93 and 94 will be transmitted to the shaft 32 by means of the pinion 88 thereby driving the shaft 32 and the key 42 in a

clockwise direction. As the shaft 51 moves clockwise it will carry the finger 71 of the key 63 into contact with the stop 81 thereby rotating the key 63 from the driving to the neutral position. Simultaneously the motion of the shaft 32 will carry the finger 48 of the key 42 into contact with the stop 74 thereby rotating the key 42 from the neutral to the driving position. The normal clearances between the various gears will permit the key 42 to become engaged between the shaft 32 and the gear 27 before the key 63 is fully disengaged, thereby insuring a smooth pick-up of driving power by the shaft 32. The continued rotation of the bevel gear 27 and ring gear 28 in a counter-clockwise direction will now drive the shaft 32, the key 42 and the pinion 88 in a counter-clockwise direction reversing the direction of motion of the racks and the traverse bars. The motion of the racks will be transmitted to the shaft 51 by means of the pinion 89 thereby rotating the shaft 51 and the key 63 in a counter-clockwise direction. As the key 63 approaches the stop 82 the key 42 will approach the stop 73 to effect the simultaneous operation of both keys to again reverse the motion of the racks and traverse bars.

It may be seen that the reversing mechanism of this invention is built almost entirely of relatively simple mechanical elements and is so constructed as to be free of uneven wear. In addition, any wear which does occur may be readily compensated for by suitably adjusting the stops which operate the keys.

Various modifications may be made in the reversing mechanism of this invention without effecting its mode of operation. For example, one of the racks may be eliminated if it is desired to drive only one traverse bar although it is preferable, even in this case, to retain both racks and thereby achieve a balanced construction. Furthermore it is entirely feasible to drive the reversing mechanism without employing the bevel gears shown, so long as a suitable driving means is furnished for one of the gears which is alternately engaged and disengaged from its supporting shaft.

It is to be understood that the foregoing detailed description is given merely by way of illustration and that many variations may be made therein without departing from the spirit of my invention.

Having described my invention, what I desire to secure by Letters Patent is:

1. A reversing mechanism comprising a connecting element movable in opposite directions, a member operatively connected to said connecting element, and means for moving said member and said connecting element in one direction and then in the opposite direction, said means including a plurality of operatively connected rotatable members, means for rotating said rotatable members in opposite directions, a plurality of rotatable supporting means for supporting said rotatable members for free rotation with respect thereto, keying means carried by each of said supporting means and having a finger extending therefrom and stop means cooperating with said fingers for actuating said keying means and reversing the direction of motion of said connecting element.

2. A reversing mechanism comprising a connecting element movable in opposite directions, a plurality of driven members operatively connected to said connecting element, and means for moving said driven members and said connecting element in one direction and then in the opposite

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direction, said means including a plurality of operatively connected rotatable members, means for rotating said rotatable members in opposite directions, a plurality of rotatable supporting means for supporting said rotatable members for free rotation with respect thereto, keying means carried by each of said supporting means and having a finger extending therefrom and stop means cooperating with said fingers for actuating said keying means and reversing the direction of motion of said connecting element.

3. A reversing mechanism comprising a plurality of connecting elements movable in opposite directions with respect to each other, a plurality of driven members operatively connected to said connecting elements, and means for moving said driven members and said connecting elements in one direction and then in the opposite direction, said means including a plurality of operatively connected rotatable members, means for rotating said rotatable members in opposite direction, a plurality of rotatable supporting means for supporting said rotatable members for free rotation with respect thereto, keying means carried by each of said supporting means and having a finger extending therefrom and stop means cooperating with said fingers for actuating said keying means and reversing the direction of motion of said connecting elements.

4. A reversing mechanism comprising a plurality of connecting means movable in opposite directions with respect to each other, a plurality of driven members operatively connected to said connecting elements, and means for moving said driven members and said connecting elements in one direction and then in the opposite direction, said means including a plurality of operatively connected rotatable members, means for rotating said rotatable members in opposite directions, a plurality of rotatable supporting means for supporting said rotatable members for free rotation with respect thereto, keying means carried by each of said supporting means and having a finger extending therefrom and stop means coop-

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erating with said fingers for actuating said keying means and reversing the direction of motion of said connecting elements, said supporting means carrying said driven members for rotation therewith.

5. A reversing mechanism comprising a plurality of connecting elements movable in opposite directions with respect to each other, a plurality of driven members operatively connected to said connecting elements, and means for moving said driven members and said connecting elements in one direction and then in the opposite direction, said means including a plurality of operatively connected rotatable members, means for rotating said members in opposite directions, a plurality of rotatable supporting means, having a cut-out portion therein, for supporting said rotatable members for free rotation with respect thereto, keying means carried in the cut-out portion of each of said supporting means for alternatively keying said supporting means to said rotatable member carried thereby, said keying means having fingers extending therefrom, and stop means cooperating with said fingers for actuating said keying means and reversing the direction of motion of said connecting elements.

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Certificate of Correction

Patent No. 2,525,929

October 17, 1950

ARTHUR MEDER

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows:

Column 5, line 22, for the word "direction" read *directions*; line 31, for "means" read *elements*;

and that the said Letters Patent should be read as corrected above, so that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 19th day of December, A. D. 1950.

[SEAL]

THOMAS F. MURPHY,
Assistant Commissioner of Patents.