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THREAD-ADVANCING REEL

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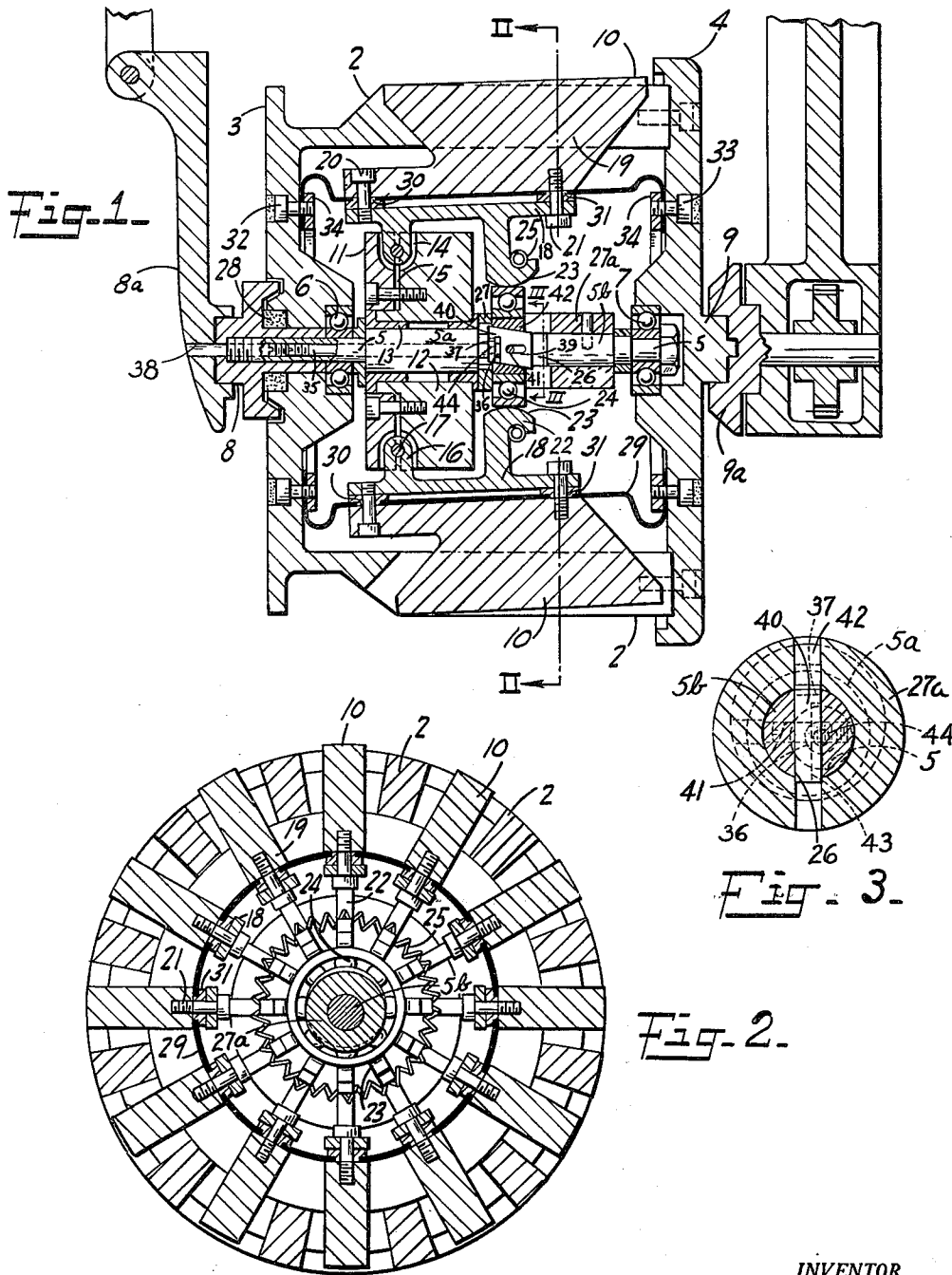


Fig. 2.

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THREAD-ADVANCING REEL

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6 Claims. (Cl. 28—71.6)

This invention relates to thread-advancing reels which may be used for the production of a yarn store which is continuously advanced axially of the periphery of the reel during which time it may be subjected to fluid treatment in the manner and for the purposes conventional in the art.

In the drawing, illustrative of the invention,

Figure 1 is a mid-section taken axially through one embodiment of the reel of this invention,

Figure 2 is a section taken on line II—II of Figure 1, and

Figure 3 is a cross-section of a detail taken on line III—III of Figure 1.

As shown, the reel is embodied in a structure adapted to be supported at both ends, though it is to be understood that, by suitable modification, it may be embodied in a cantilever form, supported at one end only of its axis.

The reel comprises a concentric set of spaced longitudinally extending bar members 2 which form the cylindrical periphery of a cage-like system comprising the end flanges 3 and 4 mounted rotatably as a unit upon shaft 5 by means of suitable bearings 6 and 7. A male coupling member 8 is adapted to be received within a socket of a supporting member 8a which ordinarily maintains the shaft 5 stationary. The flange 4 is provided with a male coupling member 9 which may be provided with a projecting rib of non-circular cross-section and is adapted to be received in a female coupling member 9a on a suitable driving shaft whereby the cage may be rotated with respect to the shaft 5.

A second set of spaced, longitudinally extending bar members 10 are arranged to alternate with and interdigitate between the bar members 2 of the first set. The supporting means for the bar members 10 comprises a pair of annular telescoping members 11 and 12 which are rotatably mounted on suitable bushings 13 on an intermediate eccentric portion 5a of shaft 5. A number of spaced radial recesses 14 extend transversely of the plane of juncture 15 between members 11 and 12 and receive ears 16 which are pivotally mounted on the pins 17 which extend across the recesses 14 into suitable bearing recesses at each side thereof. The ears 16 are connected to the strips 18 which in turn are secured to the inwardly extending portions 19 of the bar members 10 by screws 20 and 21. The strips 18 also carry toward one end thereof depending hook-like ears 22 which have arcuate surfaces 23 bearing upon the outer race of ball bearing 24. A spring 25 surrounds the hooked portions of

ears 22 and presses them against the bearing 24.

The bearing 24 is adjustably mounted with respect to a portion 5b of the shaft 5 by means of the bushing 42 as shown in Figures 1 and 3. The intermediate portion 5b of the shaft 5 is concentric with the eccentric portion 5a and has a diametrically extending transverse slot 26 which extends from the juncture of portions 5a and 5b and is disposed at an angle to the direction of offset. The sleeves 27 and 27a serve to locate the bearing 24 axially of the shaft 5 and are slotted to permit the axial travel of the sliding cam plate 40 within the slot 26. A central screw headed rod 35 threadedly engages the interior of shaft 5 which is hollow at one end and has a foot 36 (formed by grooving out a neck adjacent to the end of the rod) engaging a slot 37 in the cam plate 40. The cam plate 40 is cut away at 43 (Figure 3) to permit vertical displacement of the plate 40 with respect to the neck portion 44 of rod 35 adjacent the foot 36. A bore 38 in the supporting member 8a and the coupling 8 provides access to a screw driver or equivalent tool to adjust the axial position of rod 35 within the hollow portion of the shaft 5 and thereby move the cam plate 40 axially also. A slot 39 in plate 40 cooperates with a transverse pin 41 through the eccentric portion 5b of shaft 5 to prevent radial motion of plate 40 while permitting the axial motion. A bushing 42 mounted on the portion 5b of the shaft has a pair of opposed sloped surfaces which bear against the sloped surfaces of the cam plate 40 so that as the plate moves axially the axis of bearing 24 carried on the bushing 42 is offset from the axis of the eccentric portion 5b in a direction which is at an angle to the direction of offset of the axis of portion 5b with respect to the axis of shaft 5.

A packing ring 28 may be placed between the coupling 8 and the flange 3. Also, the reel may be provided with a flexible sealing member 29 of rubber or synthetic rubber or rubber substitute, which member may take the general form of an annular sleeve having a ring of perforations 30 and another ring of perforations 31 which permit the passage of screws 20 and 21 respectively. The ends of the flexible sealing member 29 may be secured as at 32 and 33 between rings 34 and the adjacent wall of flanges 3 and 4 respectively.

It should be noted that the ends of bar members 10 to the left as seen in Figure 1 are approximately in the plane of the pins 17 so that the rocking action of bar members 10 under the influence of the eccentric and askew bearing 24 as they rotate thereabout causes alternate pro-

trusion and recession of bar members 10 from the peripheral surface of bar members 2. The lifting action of the bar members 2 during protrusion combined with the slope of the outer surfaces thereof at that period results in motion of the thread axially or longitudinally of the reel toward the left as viewed in Figure 1.

As stated above, coupling member 8 may be held stationary in a suitable mating socket in the supporting member 8a. However, if desired, rotation may be imparted to shaft 5 through coupling member 8 by providing an arrangement similar to the right of the reel as viewed in Figure 1. This rotation may be in the same or opposite angular direction as the rotation imparted to the reel by coupling member 9. By rotating the shaft 5 in the opposite direction, a greater frequency of actuation of the bar members 10 relative to bar members 2 is effected per revolution of the reel by coupling 9. On the other hand rotation of shaft 5 in the same direction reduces the frequency of actuation of bar members 10 relative to bar members 2.

It is obvious that this reel may be converted into a cantilever form supported at one end only. For example, shaft 5 may be extended through flange 4 and flange 4 may be provided with a concentric sleeve carrying an annular gear by which it may be driven. The shaft 5 may then be held stationary in suitable bearings or may be rotated.

It is to be understood that changes and variations may be made without departing from the spirit and scope of the invention as defined by the appended claims.

I claim:

1. A thread advancing reel comprising a set of spaced, longitudinally extending bar members rotatable about an axis, a second set of spaced longitudinally extending bar members interdigitating with the members of the first set, means for supporting the second set of bars rotatably on an axis of rotation eccentric to that of the first set, means for rotating the bar members, each of the bar members of the second set being mounted on the supporting means pivotally on a single axis transverse of the length of the bar and of the axis of rotation of the second set of bar members, and means actuated by such rotation for rocking the bar members of the second set with respect to their supporting means to effect alternate protrusion and recession thereof with respect to the bar members of the first set.

2. A thread advancing reel comprising a set of spaced, longitudinally extending bar members rotatable about an axis, a second set of spaced longitudinally extending bar members interdigitating with the members of the first set, means for supporting the second set of bars rotatably on an axis of rotation eccentric to that of the first set, said second set of bar members being mounted on the supporting means pivotally on axes transverse of the axis of rotation thereof, an eccentric bearing spaced axially of the reel away from the pivotal axes of the second set of bar

members, and the second set of bar members being arranged to bear against the eccentric bearing.

3. A thread advancing reel comprising a set of spaced, longitudinally extending bar members rotatable about an axis, a second set of spaced longitudinally extending bar members interdigitating with the members of the first set, means for supporting the second set of bars rotatably on an axis of rotation offset from that of the first set, said second set of bar members being mounted on the supporting means pivotally on axes toward one end of the bar members and transverse of the axis of rotation thereof, an eccentric bearing axially of the reel away from the pivotal axes of the second set of bar members toward the other end thereof, and the second set of bar members being arranged to bear against the eccentric bearing.

4. A thread-advancing reel comprising a shaft, a set of spaced, longitudinally extending bar members rotatably mounted on the shaft, supporting means rotatably mounted eccentrically on the shaft, a second set of spaced, longitudinally extending members interdigitating with those of the first set and pivotally mounted on the supporting means on axes transverse of the shaft, an eccentric bearing secured to the shaft and spaced axially of the reel away from the pivotal axes of the bar members, and means for causing the bar members of the second set to bear against the eccentric bearing.

5. A thread-advancing reel comprising a shaft, a set of spaced, longitudinally extending bar members rotatably mounted on the shaft, supporting means rotatably mounted eccentrically on the shaft, a second set of spaced, longitudinally extending members interdigitating with those of the first set and pivotally mounted on the supporting means on axes transverse of the shaft, an eccentric bearing secured to the shaft and spaced axially of the reel away from the pivotal axes of the bar members, means for adjusting the offset of the center of the bearing with respect to the axes of rotation of both sets of bar members, and means for causing the bar members of the second set to bear against the eccentric bearing.

6. A thread advancing reel comprising a shaft, a set of spaced, longitudinally extending bar members rotatably mounted concentrically on the shaft, supporting means rotatably mounted eccentrically on the shaft, a second set of spaced, longitudinally extending members interdigitating with those of the first set and being mounted on the supporting means for independent pivotal motion with respect thereto on axes transverse of the shaft and near one end of the bar members of the second set, an eccentric bearing on the shaft and spaced axially of the reel away from the pivotal axes toward the other end of the bar members, ears on the bar members of the second set, and resilient means for causing the ears to continuously bear against the eccentric.

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