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REELING DEVICE

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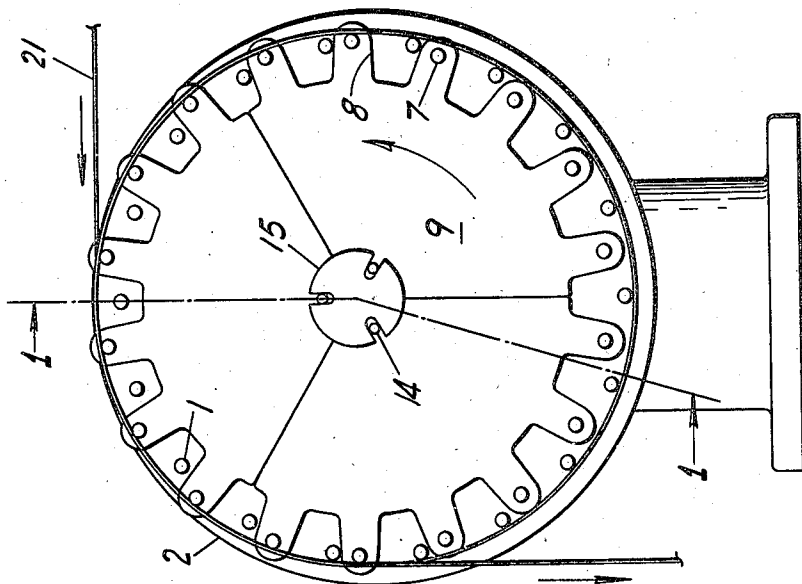


Fig. 2.

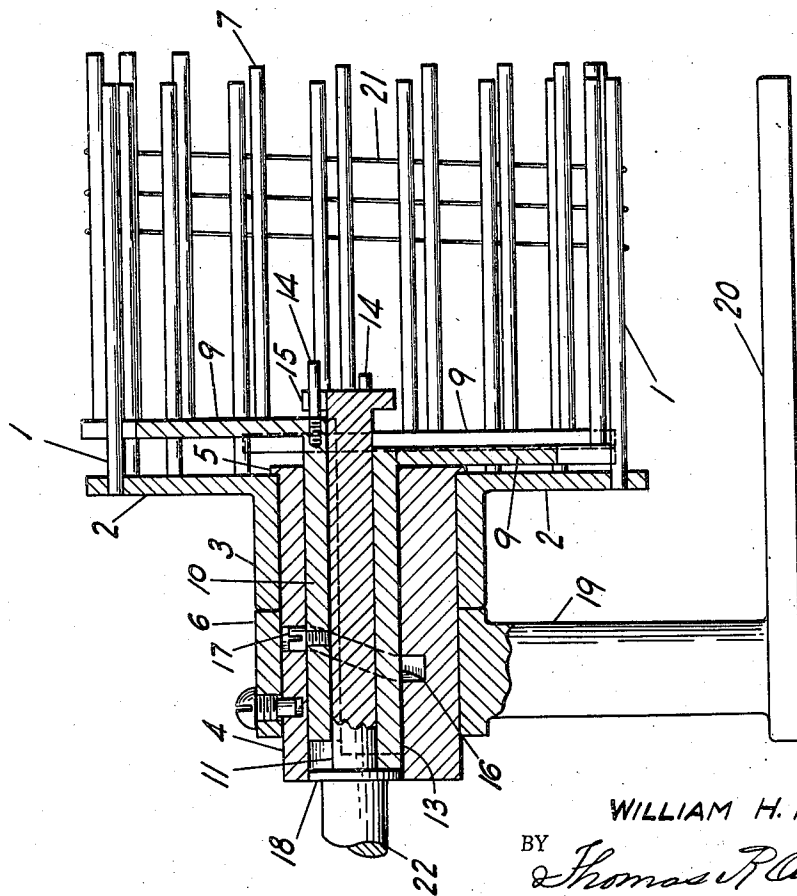


Fig-1-

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REELING DEVICE

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13 Claims. (Cl. 28—71.6)

This invention relates to improvements in apparatus for reeling thread and advancing the thread being reeled lengthwise of the reel. The invention is applicable to reeling yarns, filaments, tow, strands and the like as well, and wherever the term thread is used hereinafter it is intended to include these materials.

The invention has for its principal object to provide improvements in apparatus for reeling thread and advancing the thread being reeled lengthwise of the reel in a plurality of spaced apart substantially helical turns.

Another object of the invention is to provide improvements in apparatus for reeling thread and advancing the thread being reeled lengthwise of the reel in a plurality of spaced apart substantially helical turns comprising two substantially cylindrical sets of thread-supporting members, the sets being mounted to rotate about spaced apart parallel axes and with means for moving groups of members of one of the sets together as a unit in a direction lengthwise of the reel while supporting the thread thereon.

A further object of the invention is to provide improvements in apparatus for reeling thread and advancing the thread being reeled lengthwise of the reel in a plurality of spaced apart substantially helical turns comprising two substantially cylindrical sets of thread supporting members, the sets being mounted to rotate about parallel spaced apart axes with groups of thread supporting members of one of the sets rigidly mounted together, and means for moving the thread supporting members rigidly mounted together as a unit in a direction lengthwise of the reel while supporting the thread thereon.

These and other objects of the invention will be apparent from the following description and accompanying drawing.

In the drawing,

Figure 1 is a sectional view of an embodiment of the invention taken on the line I—I in Figure 2.

Figure 2 is a front elevational view of the embodiment of the invention shown in Figure 1.

Applicant's invention provides a novel and simplified form of thread storage, thread advancing reel in which groups of the movable thread supporting members are rigidly mounted on a supporting member for movement together as a unit in a direction lengthwise of the reel as distinguished from the form of thread storage, thread advancing reel in which the movable thread sup-

porting members are each separately mounted and separately movable.

Referring to the drawing, reference character 1 indicates one of a substantially cylindrical set of thread supporting bar members mounted adjacent the periphery of the annular disk 2 having the hub portion 3 which is mounted to rotate on the stationary sleeve member 4 about the center thereof as an axis. This cylindrical set of thread supporting bars is prevented from moving longitudinally on its supporting sleeve by the flange 5 at the end of the sleeve and the collar member 6 mounted on the upright support 19. A second substantially cylindrical set of thread supporting bar members 7 is mounted on the outwardly extending portions 8 of the flange segments 9 with a plurality or group of thread supporting bar members rigidly mounted on each flange segment. The flange segments are fixed to axially extending sleeve segments 10 which are mounted to slide back and forth longitudinally on the cylindrical rotor member 11. The cylindrical rotor extends through the cylindrical bore 13 in the stationary sleeve member, the axis of which is parallel to but laterally spaced from the axis of the stationary sleeve member. The radius of curvature of the outer surface of the sleeve segments is the same as the radius of the bore in the stationary sleeve member and the radius of curvature of the inner surface of the sleeve segments is the same as the radius of the cylindrical rotor so that the sleeve segments and the rotor may rotate as a unit about the axis of the bore in the stationary sleeve member. The sleeve segments are provided with pin members 14 which extend longitudinally beyond the flange segments and through openings in the outwardly extending flange 15 fixed to the end of the cylindrical rotor to form a driving connection therewith. The outwardly extending portions 8 of the flange segments are positioned between the thread-supporting bars 1 and form a driving connection therewith. The diameter of the cylindrical set of thread-supporting bars 1 is substantially the same as that of the cylindrical set of thread-supporting bars 7, but due to the eccentricity of their axes, the thread-supporting bars 7 on each of the flange segments extend outwardly beyond the periphery of the other cylindrical set of thread-supporting bars 1 during a portion of their revolution, and are positioned within the periphery of the other cylindrical set of thread supporting bars during the remainder of their revolution. A continuous cam groove 16 is formed in the inner wall of the

bore of the stationary cylindrical sleeve and extends around its periphery and the sleeve segments are each provided with outwardly extending cam follower pins 17 which engage the cam groove. The path of the cam groove is such that the sleeve segments and the thread-supporting bars carried thereon are moved longitudinally in the direction it is desired to advance the thread on the reel, while these thread-supporting bars are outside the periphery of the other cylindrical set of thread-supporting bars and the thread-supporting bars that have been advanced are moved back to their starting position while they are within the periphery of the other cylindrical set of thread-supporting bars. The longitudinal movement of the sleeve segments is determined by the cam groove and the flanges 15 and 18 on the cylindrical rotor. The cylindrical rotor is fixed to the drive shaft 22 which is driven by suitable means which are not shown. The reel is supported in operative position by the stationary sleeve member 4 which is shown for example in the drawing as fixed, by a set screw, in the collar member on the up-right 19 mounted on the base member 20.

In the operation of the embodiment of the invention described above, the cylindrical rotor is rotated by the drive shaft and through its driving connection with the pin members 14 on the sleeve segments, rotates the sleeve segments, the flange segments, and the thread-supporting members carried thereby, about the axis of the cylindrical rotor. The outwardly extending portions 8 on the flange segments engage the thread-supporting bar members 1 of the other cylindrical set and cause the bar members 1 to rotate with the annular disk member 2 to which they are attached and the hub member 3 about the axis of the stationary sleeve 4 which axis is parallel to but spaced from the axis of the rotor. Due to the eccentricity of the axes about which the two cylindrical sets of thread-supporting bars rotate, the thread-supporting bars of one set are beyond the periphery of the thread-supporting bars of the other set during a portion of their revolution. The thread-supporting bars on the flange segments are shifted longitudinally of the reel, while they are beyond the periphery of the other cylindrical set of thread-supporting bars. When the thread-supporting bar on the segment that has been shifted longitudinally is again within the periphery of the other cylindrical set of thread-supporting bars, they are shifted back to their former position. Thread 21 to be reeled is delivered to the reel adjacent the flange segments and is supported throughout a portion of each turn by the thread-supporting bars 1 and throughout the rest of each turn by the thread-supporting bars 7 which extend beyond the periphery of the other set of thread-supporting bars. In this manner successive portions of the turns of thread on the reel are shifted longitudinally of the reel while said portions are supported at a plurality of spaced points.

While a preferred embodiment of the invention has been shown, 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.

What I claim is:

1. Apparatus for reeling thread and advancing the thread lengthwise of the reel comprising two substantially cylindrical sets of thread-supporting members extending lengthwise of the reel; mounting mechanisms therefor, positioned in parallel

relation and mounted to rotate about substantially parallel spaced apart axes; and means for moving thread-supporting members of one set relative to the thread-supporting members of the other set in a direction lengthwise of the reel, the thread-supporting members of both sets being rigidly secured to their respective mounting mechanisms.

2. Apparatus for reeling thread and advancing the thread lengthwise of the reel comprising two substantially cylindrical sets of thread-supporting members extending lengthwise of the reel; mounting mechanisms therefor, positioned in parallel relation and mounted to rotate about parallel spaced apart axes; the thread-supporting members of both sets being functionally integral with their respective mounting mechanisms, and means for moving a plurality of thread-supporting members of one set as a unit relative to thread-supporting members of the other set in a direction lengthwise of the reel.

3. Apparatus for reeling thread and advancing the thread lengthwise of the reel comprising two substantially cylindrical sets of thread-supporting members extending lengthwise of the reel, a head for each set, the members of both sets being rigidly secured in their respective heads, said cylindrical sets of thread-supporting members being mounted to rotate about substantially parallel spaced apart axes so that at least some of the thread-supporting members of one set are outside the periphery of thread-supporting members of the other set and means for moving a plurality of those thread-supporting members of said one cylindrical set that are outside the periphery of the other cylindrical set as a unit relative to the thread-supporting members on the other set in a direction lengthwise of the reel.

4. Apparatus for reeling thread and advancing the thread lengthwise of the reel comprising two substantially cylindrical sets of thread-supporting members extending lengthwise of the reel, a head for each set, the members of both sets being rigidly secured in their respective heads, said cylindrical sets of thread-supporting members being mounted to rotate about substantially parallel spaced apart axes that are within the periphery of one of the cylindrical sets of thread-supporting members so that at least some of the thread-supporting members of one cylindrical set are outside the periphery of the thread-supporting members of the other set and means for moving a plurality of those thread-supporting members of said one cylindrical set that are outside the periphery of the other cylindrical set as a unit relative to the thread-supporting members on the other set in a direction lengthwise of the reel.

5. Apparatus for reeling thread and advancing the thread lengthwise of the reel comprising two substantially cylindrical sets of thread-supporting members, a stationary cylindrical sleeve member and means for rotatably mounting one of said cylindrical sets of thread-supporting members thereon; means in parallel relation to said mounting means for mounting the other cylindrical set of thread-supporting members to rotate about an axis extending through the sleeve member substantially parallel to but spaced from the axis of the sleeve member and means for moving a plurality of thread-supporting members of one set as a unit relative to said supporting members of the other set in a direction lengthwise of the reel.

6. Apparatus for reeling thread and advancing the thread lengthwise of the reel comprising two

substantially cylindrical sets of thread-supporting members, a stationary cylindrical sleeve member on which one of said cylindrical sets of thread-supporting members is rotatably mounted, a rotor extending through the sleeve member on which said other cylindrical set of thread-supporting members is mounted and adapted to rotate within the sleeve member about an axis substantially parallel to but spaced from the axis of the sleeve member and means for moving a plurality of the thread-supporting members of the cylindrical set mounted on the rotor as a unit relative to the thread-supported members of the other set in a direction lengthwise of the reel.

7. In apparatus for reeling thread and advancing the thread along the reel, the combination which includes two sets of thread-supporting members cooperating to define the periphery of the reel; a pair of disc-like heads in parallel relation, a shaft for each head, and means cooperating with at least one of the shafts to provide axial movement thereof relative to the other shaft; the combination being characterized in that each set of thread-supporting members is rigidly mounted in its head in a position at right angles to the plane of the head, and in that the axes of the shafts are parallel but spaced apart.

8. Apparatus as set forth in claim 7, in which one of the heads and the supporting shaft therefor are segmentally divided.

9. Apparatus as set forth in claim 7, in which one of the shafts is housed within the other.

10. Apparatus as set forth in claim 7, in which the shafts are supported by a sleeve bearing lying within one shaft and surrounding the other shaft, and in which the means to provide axial movement of one of the shafts comprises cam mechanism entirely housed within the outer periphery of the outer shaft.

11. Apparatus for reeling thread and advancing the thread along the reel, comprising two sets of thread-supporting members cooperating to form the periphery of the reel; a pair of heads in each of which one set of thread-supporting members is mounted; a pair of hollow shafts, mounted one within the other, each of which carries one of the heads; and cam mechanism entirely enclosed within the outer shaft and operative to effect axial movement of one shaft with respect to the other upon rotation of either.

12. The apparatus of claim 11 in which one of the heads is segmentally divided and in which the shaft supporting said segmentally divided head is divided into corresponding segments.

13. The apparatus of claim 11 in which a head and its supporting shaft are segmentally divided, and in which each shaft segment is provided with cam means.

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