

Nov. 15, 1938.

L. E. LOVETT

2,136,556

THREAD STORE DEVICE

Filed June 15, 1936

2 Sheets-Sheet 1

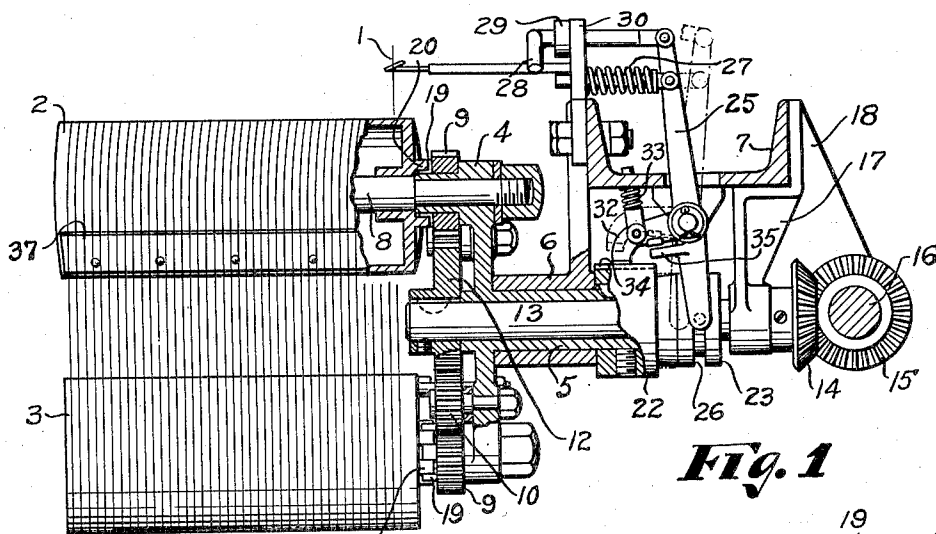


Fig. 1

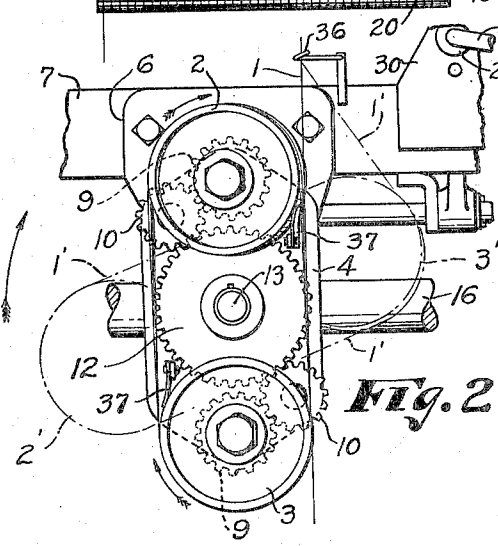


Fig. 2

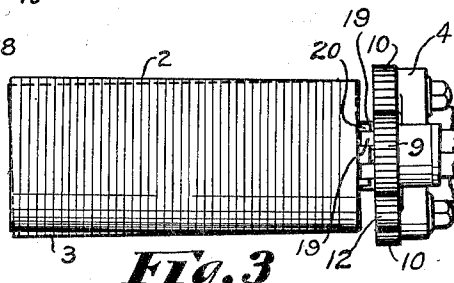


Fig. 3

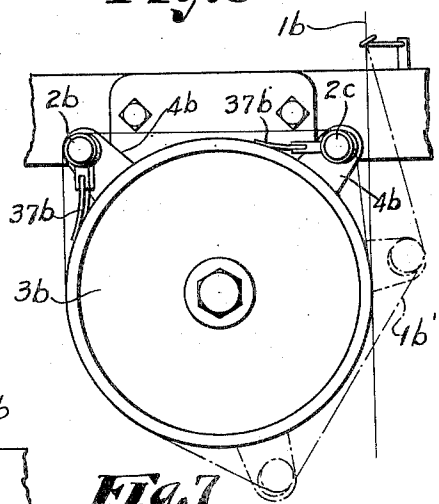


Fig. 7

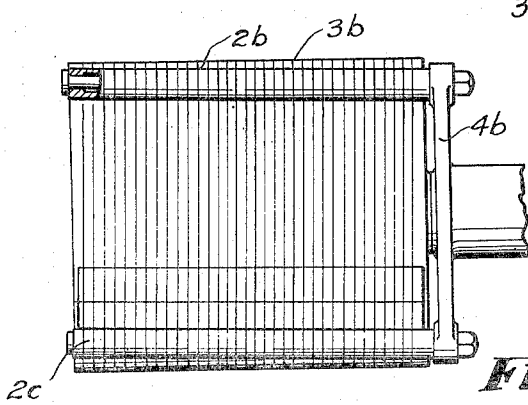


Fig. 8

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2 Sheets-Sheet 2

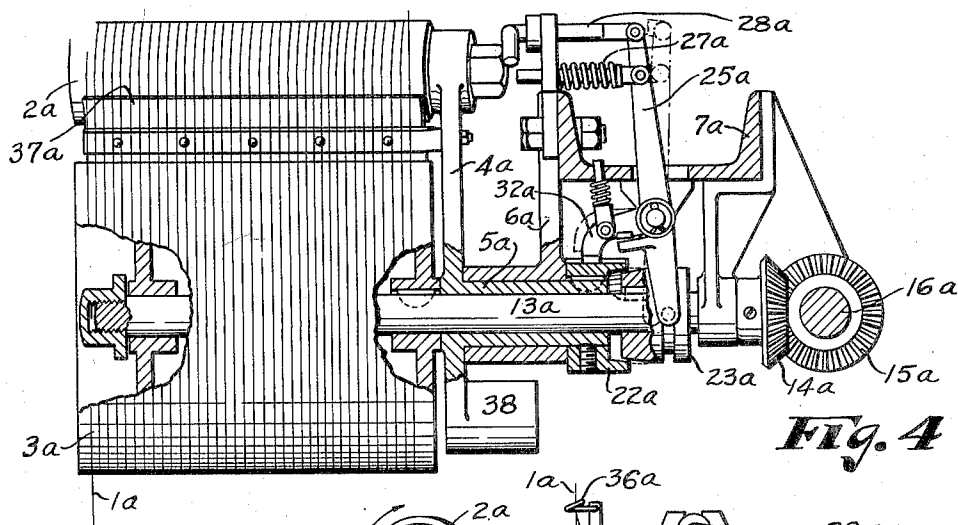


Fig. 4

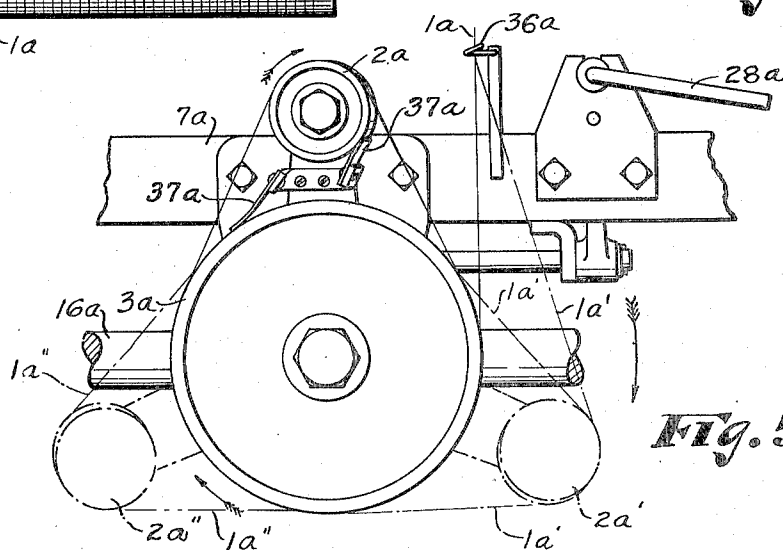


Fig. 5

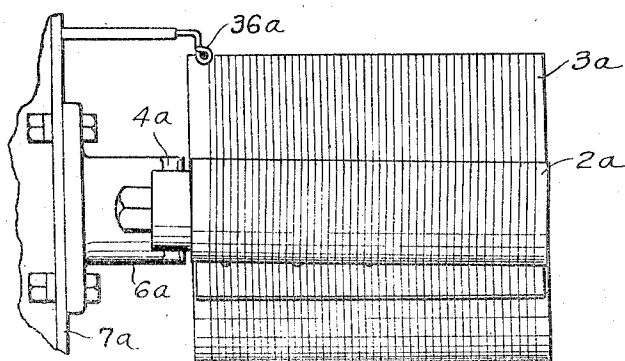


Fig. 6

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2,136,556

THREAD STORE DEVICE

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Application June 15, 1936, Serial No. 85,240

15 Claims. (Cl. 242—53)

This invention relates to thread store devices of the type comprised of a plurality of spaced, longitudinally extending thread-advancing members which, during normal operation of the thread store device and because of inclined relation between at least two of the thread-advancing members thereof and rotation about its own axis of at least one of the thread-advancing members thereof, are adapted to advance longitudinally of the thread store device in a plurality of spaced generally helical turns thread or the like wound about said thread-advancing members. An example of a thread store device of this type is one comprised of two spaced, generally cylindrical members rotatably mounted about inclined axes. By means of devices of this type, a relatively long length of thread or the like may be temporarily continuously stored in a relatively small space. While the thread or the like is so stored, processing medium may readily be applied thereto, wherefore thread store devices of this type find application in apparatus for the continuous processing of thread or the like.

More particularly, the invention relates to a method of and apparatus for initially winding thread or the like about the thread-advancing members of thread store devices of this type. Ordinarily, such thread store devices must be threaded up by hand; i. e., the thread or the like must at the outset be wound by hand in the desired number of generally helical turns about the thread-advancing members of the thread store device. However, in application No. 70,238, filed March 23, 1936, by Emerson B. Helm, it has been proposed to initially wind thread or the like on a thread-advancing thread store device comprised of a plurality of spaced, longitudinally extending thread-advancing members by rotating such members about an axis substantially parallel thereto but offset therefrom, meanwhile causing a relative movement substantially parallel to said axis of rotation between said thread-advancing members and the source of thread or the like. The thread or the like is thus started on such thread-advancing members, being wound thereon in a plurality of spaced, generally helical turns.

According to the method of the instant invention, the thread or the like is initially wound on a thread-advancing device of the aforementioned type comprising a plurality of longitudinally extending thread-advancing members at least two of which are in inclined relation and at least one of which is rotatable about its own axis, this being accomplished by rotating the thread store device as a whole about an axis extending longi-

tudinally thereof. However, according to the instant invention, thread or the like supplied to the device, as from a point fixed with respect to the locus described by said thread-advancing members during such rotation, is caused to wind about the thread-advancing members of the device in a plurality of turns which are contained substantially in a common plane passing preferably through the points on said thread-advancing members at which the thread or the like first contacts with said members during normal operation of the thread store device. The purpose of winding the thread or the like in this fashion during such rotation of the thread store device is to form a band or belt of thread or the like in which the leading end of the thread or the like is contained.

After the formation of such band or belt of thread or the like, the rotation of the thread store device as a whole is halted and such thread-advancing members thereof as are rotatable are rotated about their own axes, thus causing the thread store device to perform its normal thread-advancing operation. During such operation, the band or belt of thread or the like is caused to travel around the thread store device and to progress longitudinally thereof. Since the thread or the like in the belt or band is an integral part of and in fact continuous with the thread or the like being supplied from the source, succeeding generally helical turns of thread or the like are wound at spaced intervals about and advanced longitudinally along the thread-advancing members of the device. The turns of thread are allowed to be formed in this manner until the desired number of turns are wound about the device, after which the aforementioned band or belt of thread or the like is removed and the free end of the thread or the like led off the device.

This operation in contradistinction to previous methods, including manual methods, of threading up thread store devices of this type requires very little manipulation of either the thread or the like or of the thread store device. It is especially well adapted to threading up of the thread store device by wholly mechanical means. Furthermore, devices of this type may be threaded up in this manner without disconnecting them from the driving means or otherwise stopping them, thus providing, if desired, a substantially constant take-up of the thread or the like from its source of supply. Other advantages of the invention will be apparent from the succeeding description thereof.

For the purposes of illustration, the method

above referred to of threading up such thread store devices will be discussed in connection with thread store devices comprised of a rotatable, generally cylindrical member having spaced from and inclined to the axis thereof one or more other members which may or may not be rotatable, each of said inclined members being inclined to the axis of said generally cylindrical member in a plane which is parallel to the axis of said generally cylindrical member, each of the devices shown being of cantilever form; i. e., supported and driven from one end only thereof, the other end being free of supporting or driving means and in fact unobstructed. In devices of this kind, the above-mentioned initially wound belt or band of thread or the like may be discharged automatically from the free end of the device after it has progressed longitudinally of the device, thus obviating the necessity of removing such belt or band of thread or the like from the device by other means. For convenience, the invention will be described as applied to the winding of thread, although it will of course be understood that it may be employed to equal advantage in the winding of thread-like articles of other kinds.

In the drawings, in which are shown three illustrative embodiments of thread store devices adapted to the practice of the present invention, Figure 1 is an elevation of a cantilever thread store device comprising two spaced, generally cylindrical members rotatably mounted about axes which are in inclined relation to each other, parts being broken away. Figure 2 is an end elevation thereof. Figure 3 is a plan thereof. Figure 4 is an elevation of another form of cantilever thread store device comprising two offset and askew generally cylindrical members, parts being broken away. Figure 5 is an end elevation thereof. Figure 6 is a plan thereof. Figure 7 is an end elevation of still another form of cantilever thread store device comprising a rotatable, generally cylindrical member having associated therewith two members, spaced therefrom and askew thereto, which are not independently rotatable about their own axes. Figure 8 is a plan elevation thereof.

In the normal operation of the thread store device of Figures 1, 2, and 3 after it has once been threaded up, the thread 1 is caused to advance in the conventional manner longitudinally of two spaced askew generally cylindrical thread-advancing members 2 and 3 by rotation of each about its own axis. In the embodiment of these figures, generally cylindrical members 2 and 3 are supported from one end only of the thread store device by frame member 4, which has a boss portion 5 journaled in supporting member 6 carried by frame 7. The generally cylindrical members 2 and 3 are rotatably mounted on shafts 8 supported in the desired inclined relation by frame member 4, the generally cylindrical members 2 and 3 being rotated by gears 9 which are driven through intermediate gears 10 supported on frame member 4 from gear 12, which is mounted for rotation with drive shaft 13 concentrically journaled in the boss portion 5 of frame member 4. Drive shaft 13 may be driven in any suitable manner as by gears 14 and 15 from a main drive shaft 16. If desired, suitable brackets 17 and 18, supported by frame 7, may be provided to support drive shaft 16 and the end of drive shaft 13.

To compensate for the inclined relation of generally cylindrical members 2 and 3, each of the gears 9 may be provided with teeth 19 which en-

gage corresponding teeth 20 on the corresponding generally cylindrical member 2 or 3, thus permitting the gears 9 to be mounted on frame member 4 about axes which are parallel to the axis of shaft 13 on which gear 12 is mounted, notwithstanding the fact that one or both of the axes of the generally cylindrical members 2 and 3 may be inclined to the axis of shaft 13. Suitable means may be provided to rotate frame member 4 when desired, such means in the embodiment shown comprising a cone clutch member 22 mounted on and for rotation with the boss portion 5 of frame member 4 and a cone clutch member 23 mounted for slidable motion along and rotation with drive shaft 13.

Cone clutch member 23 is adapted to be engaged with the clutch member 22 by means of the shifter lever 25, actuating a fork which operates in groove 26 of clutch member 23, a spring 27 being provided to hold the clutch members 23 and 22 in engagement when it is desired to drive through the clutch. Handle 28, connected to lever 25, may be provided at a suitable convenient position to operate the clutch, said handle 28, during normal operation of the thread store device, holding the clutch disengaged against pressure of the spring 27 by means of stops 29 and 30. To maintain the frame member 4 in the desired position during normal operation of the thread store device suitable means may be provided, such as a finger 32 operating against pressure of the spring 33 and engaging suitable slot 34 in clutch 22, said finger 32 being adapted to be disengaged from slot 34 when clutch member 23 is engaged with clutch member 22, as by contact of finger 32 with the lug 35 on the shifter fork.

Assuming that the thread store device is in the position shown, that no thread is wound about the generally cylindrical members 2 and 3, and that it is desired to thread up the thread store device, the operator by releasing handle 28 engages clutch member 23 with clutch member 22, thus causing the frame member 4 to rotate about the axis of shaft 13. This results from the fact that frame member 4 is connected to drive shaft 13 which is rotated by main drive shaft 16. During such rotation, in this particular embodiment of the invention, the generally cylindrical members 2 and 3 obviously do not rotate, because of the absence of relative movement between frame member 4 and gear 12. In the particular apparatus illustrated and as shown in Figure 2, the direction of rotation is indicated by the arrow, this direction being preferably in the same angular direction as the direction of rotation of the generally cylindrical members 2 and 3 about their own axes during normal operation of the thread store device. Broken lines 2' and 3' indicate the position of the generally cylindrical members 2 and 3 at one point in the path of rotation.

Thread 1 supplied through guide 36 is caused to contact with the generally cylindrical members 2 and 3 during their rotation and is therefore caused to wind about both of them, as indicated by broken lines 1' of Figure 2. Since there is no relative movement longitudinally of the generally cylindrical members 2 and 3 between them and guide 36, which is thus fixed with respect to the locus described by the generally cylindrical members 2 and 3 during such rotation, the thread 1 is therefore caused to wind about said generally cylindrical members 2 and 3 substantially in a common plane during rotation of said generally cylindrical members about the axis of shaft 13. The rotation may be continued until one or more

complete turns of thread are thus wound about the generally cylindrical members 2 and 3, but preferably until a band or belt of thread is formed in which is contained the leading end of the thread. The rotation of the generally cylindrical members 2 and 3 about the axis of shaft 13 may then be halted by disengagement of the clutch member 23 from clutch member 22 by means of handle 28, engagement of the finger 32 with the slot 34 in clutch member 22 causing the frame 4 and the generally cylindrical members 2 and 3 to halt in the normal operating position. In the apparatus shown, the generally cylindrical members 2 and 3 commence rotating about their own axes at their normal operating speed when the frame 4 is halted, due to the relative rotative movement between gear 12 and frame member 4.

Such rotation of the generally cylindrical members 2 and 3 about their own axes, together with the inclined relation of these members, causes the belt or band of thread wound about such members to advance longitudinally thereof. To cause the leading end of the thread to become engaged with the belt or band of thread, if for any reason it becomes disengaged or if it has not been contained therein during the winding of the belt or band, suitable means may be provided, such as blades 37 of some flexible material such as celluloid positioned as shown with the free edge of each contacting with the surface of the corresponding generally cylindrical member near the point at which the thread leaves such generally cylindrical member to pass to the other generally cylindrical member. The disengaged leading end of the thread which might tend to adhere to one generally cylindrical member and be wound thereabout is in effect scraped from the surface of such generally cylindrical member by the corresponding blade 37 and thrown back into engagement with the belt or band of thread progressing longitudinally of the generally cylindrical members 2 and 3.

Since the belt or band of thread travels about the generally cylindrical members 2 and 3 as well as progresses longitudinally thereof, thread drawn by the belt or band of thread from the source of thread through the guide 36 is wound about the generally cylindrical members in a plurality of generally helical turns which are advanced longitudinally of said members. When the belt or band of thread reaches the point at which it is desired to have the thread leave the thread store device it may be picked off and the leading end of the thread thus led off. However, in the embodiment shown, the belt or band of thread will be allowed to progress longitudinally of the generally cylindrical members 2 and 3 until it is discharged from the free ends thereof, after which the thread may be led to any suitable succeeding devices. The thread store device is then operating normally, thread supplied through guide 36 being temporarily stored on the device in a plurality of advancing generally helical turns of thread and being drawn off at the free end of the device.

In the above-described operation of threading up the thread store device it may be advantageous to have the thread moist, in which case the thread will better adhere to the generally cylindrical members during the winding of the above-described band or belt of thread. Such moistening of the thread may be the result of a wet-processing operation to which the thread is subjected prior to being passed to the thread store

device on which the thread is being wound, or, if desired, the thread may be moistened for this purpose prior to being initially wound by other suitable means, such as a wick. If, as may advantageously be the case, the thread comprises artificial silk thread being treated continuously on suitable processing apparatus embodying a plurality of thread-advancing thread store devices of this kind, the thread, due to processing liquids applied thereto on such devices, may be sufficiently moist to adhere to the generally cylindrical members without requiring the presence of special moistening means.

The device of Figures 4, 5, and 6 is in general similar to that of Figures 1, 2, and 3; but whereas the generally cylindrical thread-advancing members of the device of Figures 1, 2 and 3 are rotated during the initial winding operation about an axis between such members, the thread-advancing members of Figures 4, 5 and 6 are rotated during the initial winding operation about an axis concentric with the axis of one of the thread-advancing members. The device shown in these figures comprises a generally cylindrical member 3a having spaced therefrom and inclined thereto another generally cylindrical member 2a, each of said generally cylindrical members being rotatable about its own axis. Generally cylindrical member 3a is mounted concentrically and for rotation with drive shaft 13a, which may be driven by gears 14a and 15a from a drive shaft 16a. Generally cylindrical member 2a is supported from one end only in inclined relation to member 3a by frame member 4a which is provided with a boss portion 5a journaled in supporting member 6a, which is itself supported on frame member 7a. As in the previously described embodiment, the frame member 4a may be engaged with drive shaft 13a by means of clutch members 22a and 23a, the latter of which may be operated through shifter lever 25a by handle 28a. Spring 27a may be provided to hold the clutch members in engagement and finger 32a may be provided to maintain the frame member 4a in the desired position during the normal operation of the thread store device.

In the embodiment of Figures 4, 5 and 6, assuming the apparatus to be in the position shown and that it is desired to thread up the device, the clutch is engaged by releasing handle 28a, thus causing member 4a and consequently generally cylindrical member 2a to rotate about the axis of drive shaft 13a. Counterweight 38 may be provided, if desired, to balance the weights of member 4a and member 2a. Thread 1a supplied through guide 36a is caused to contact with members 2a and 3a and thus is wound about the generally cylindrical members 2a and 3a for one or more complete turns, forming a belt or band of thread containing the leading end of the thread. Broken lines 2a' and 2a'' indicate the positions of generally cylindrical member 2a at two points in the path of rotation thereof, while lines 1a' and 1a'' indicate the position of the thread corresponding to such positions. The rotation of the generally cylindrical member 2a is then halted by disengaging clutch members 22a and 23a by means of handle 28a. Generally cylindrical member 3a is then rotated about its own axis by drive shaft 13a.

Although in the embodiment illustrated no positive driving means for generally cylindrical member 2a is shown, the band or belt of thread wound about generally cylindrical members 2a

and 3a causes member 2a to rotate about its own axis. As explained in connection with the previous embodiment, rotation of each of the generally cylindrical members about its own axis, together
 5 with the inclined relation of said generally cylindrical members, causes the belt or band of thread wound thereabout to travel around the generally cylindrical members and be progressed axially thereof, thus causing the thread 1a drawn
 10 through guide 36a to be wound about the generally cylindrical members 2a and 3a in a plurality of succeeding spaced generally helical turns which are also advanced longitudinally. Flexible blades 37a may be provided if desired
 15 to cause the free end of the thread, should it be or become disengaged, to contact with the belt or band of thread. As in the prior embodiment, the belt or band of thread may be discharged from the free ends of the generally cylindrical members 2a and 3a, after which the thread may be led to any suitable succeeding device. The thread store device of this embodiment is then operating normally.

Obviously, various other forms of thread store devices of the type comprising a plurality of spaced thread-advancing members at least two of which are in inclined relation and at least one of which is rotatable about its own axis may be adapted to the method of initially threading up provided by this invention. Thus in the
 30 embodiment of Figures 7 and 8 the thread store device shown comprises a generally cylindrical member 3b which is rotatable about its own axis and a plurality, two in the embodiment shown, of thread-advancing members 2b and 2c which
 35 are spaced from and inclined to generally cylindrical member 3b. Since all the thread-advancing members need not be rotatable, in this embodiment the thread-advancing members 2b and 2c are not rotatable about their own axes,
 40 the thread simply sliding over the surfaces of these members. The thread-advancing members 2b and 2c are supported from one end only thereof by frame member 4b, which, as in the embodiment of Figures 4, 5 and 6, may be adapted to be rotated about the axis of generally cylindrical member 3b. Obviously, the thread store
 45 device of Figures 7 and 8 may be threaded up in a manner identical with that of Figures 4, 5 and 6 and no further description of the operation is believed necessary. Flexible blades 37b, which may be supported by thread-advancing
 50 members 2b and 2c, may be provided to contact with the generally cylindrical member 3b to aid the leading end of the thread in becoming engaged with the band of thread wound about the thread-advancing members during rotation thereof about the axis of generally cylindrical member 3b. If there are provided a plurality of
 55 thread-advancing members 2b and 2c spaced from thread-advancing member 3b, the amount of inclination of each of such members to member 3b for a given spacing of the thread turns may be reduced and members 2b and 2c may, as shown, be of small size with respect to member 3b and spaced close thereto, thus reducing the amount of eccentricity of the path of the thread being initially wound about the thread-advancing members 3b, 2b and 2c, as indicated
 60 by the lines 1b and 1b', Figure 7.

It is obvious that the method of initially winding thread or the like about thread store devices of the type above indicated may be modified in various ways and that the several forms of apparatus shown as adapted to the practice of this

method are merely illustrative and capable of various modifications without departing from the spirit of the invention. For instance, the axis of rotation of the thread store device during initial winding operation may be in other positions than those shown; whereas in the embodiments of Figures 1, 2 and 3, all generally cylindrical members are rotated about their own axis, obviously only one need be so rotated; and in the embodiment of Figures 4, 5 and 6, both
 5 members may be positively driven instead of only one, as shown. Furthermore, the invention is not restricted to the initial winding of thread or the like about store devices of the above type; the invention may be applied to the winding of
 10 lengths of any material capable of being so handled. The term "thread" in the appended claims is intended to include, besides thread, all such materials.

It is intended that the patent shall cover, by 20 suitable expression in the appended claims, whatever features of patentable novelty reside in the invention.

What is claimed is:

1. A method of initially winding thread on a
 25 thread store device of the type comprised of a plurality of spaced longitudinally extending thread-advancing members, at least two of which are in inclined relation, adapted by rotation of at least one thereof about its own axis to advance
 30 longitudinally thereof thread wound about said thread-advancing members comprising the steps of rotating said thread-advancing members about an axis extending longitudinally thereof, meanwhile causing the thread to wind for one
 35 or more complete turns about said thread-advancing members at a point remote from the point at which the thread is to be discharged from said thread-advancing members; discontinuing such rotation; and causing the turns of
 40 thread so wound about the thread-advancing members to advance to the discharge point by rotating about their own axes such thread-advancing members as are rotatable.

2. A method of initially winding thread on a
 45 thread store device of the type comprised of a plurality of spaced longitudinally extending thread-advancing members, at least two of which are in inclined relation, adapted by rotation of at least one thereof about its own axis to advance
 50 longitudinally thereof thread wound about said thread-advancing members comprising the steps of rotating said thread-advancing members about an axis extending longitudinally thereof, meanwhile causing the thread to wind for one or
 55 more complete turns about said thread-advancing members at a point remote from the point at which thread is to be discharged from said thread-advancing members, and completing the winding of the thread about said thread-advancing members by rotating about their own axes such thread-advancing members as are rotatable.

3. A method of initially winding thread on a
 60 thread store device of the type comprised of a plurality of spaced longitudinally extending thread-advancing members, at least two of which are in inclined relation, adapted by rotation of at least one thereof about its own axis to advance
 65 longitudinally thereof thread wound about said thread-advancing members comprising the steps of rotating said thread-advancing members about an axis extending longitudinally thereof; causing the thread to wind for one or more complete turns about said thread-advancing members at a point thereon remote from the point at which
 70

the thread is to be discharged from said thread store device; causing the leading end of the thread to engage said turns of said thread so wound about said thread-advancing members during such rotation; and causing said turns of thread so wound to advance longitudinally of the thread store device by rotating about their own axes such thread-advancing members as are rotatable.

turns of said thread so wound about said thread-advancing members during such rotation; and causing said turns of thread so wound to advance longitudinally of the thread store device by rotating about their own axes such thread-advancing members as are rotatable.

8. A thread store device comprising a plurality of spaced, longitudinally extending thread-advancing members at least two of which are in inclined relation and at least one of which is rotatable about its own axis; means for supporting said thread-advancing members for simultaneous rotation about an axis extending longitudinally thereof; and means associated with each of said thread-advancing members which is rotatable about its own axis for preventing the thread from winding around such thread-advancing member.

9. A thread store device comprising a plurality of spaced, longitudinally extending thread-advancing members at least two of which are in inclined relation and at least one of which is rotatable about its own axis; means for supporting said thread-advancing members from one end only thereof in such manner that the other end thereof is wholly unobstructed, said supporting means being adapted for simultaneous rotation of said thread-advancing members about an axis extending longitudinally thereof; and means associated with each of said thread-advancing members which is rotatable about its own axis for preventing the thread from winding around said thread-advancing member.

10. A thread store device comprising a normally stationary frame; a plurality of spaced, longitudinally extending thread-advancing members mounted on said frame and adapted during normal operation of said thread store device to advance in a plurality of generally helical turns thread wound about said thread-advancing members; means for initially rotating said frame, together with said thread-advancing members, about an axis extending longitudinally of said thread store device; and means for supplying thread to said thread store device from a point fixed with respect to the locus described by said thread-advancing members during the initial rotation thereof.

11. A thread store device as described in claim 10 in which said thread-advancing members are supported from one end only of the thread store device, the other end thereof being free and unobstructed.

12. A thread store device comprising a normally stationary frame; a plurality of spaced, longitudinally extending thread-advancing members mounted on said frame and adapted during normal operation of said thread store device to advance in a plurality of generally helical turns thread wound about said thread-advancing members; and means for initially rotating said frame, together with said thread-advancing members, about an axis extending longitudinally of said thread store device; means for winding one or more turns of thread about said thread-advancing members during such initial rotation; and means for engaging the leading end of said thread with the turns thereof so wound about said thread-advancing members.

13. A thread store device comprising a normally stationary frame; a plurality of spaced, longitudinally extending thread-advancing members which during normal operation of said thread store device are adapted by rotation of at least one of said thread-advancing members about its

4. A method of initially winding thread on a thread store device of the type comprised of a plurality of spaced longitudinally extending thread-advancing members, at least two of which are in inclined relation, adapted during normal operation of said thread store device to advance longitudinally thereof thread wound about said thread-advancing members comprising the steps of rotating said thread-advancing members about an axis extending longitudinally thereof, meanwhile causing thread supplied from a point fixed longitudinally with respect to said thread store device to wind about said thread-advancing members in one or more complete turns; engaging the leading end of the thread with such turns; and thereafter instituting the normal thread-advancing operation of said thread store device.

5. A method of initially winding thread on a thread device of the type comprised of a pair of spaced, inclined, longitudinally extending thread-advancing members adapted by rotation of at least one thereof about its own axis to advance longitudinally thereof thread wound about said thread-advancing members comprising the steps of rotating said thread-advancing members about an axis extending longitudinally thereof, meanwhile causing thread to wind for one or more complete turns about said thread-advancing members substantially at the point at which the thread initially contacts said thread-advancing members during the normal operation of the thread store device; discontinuing such rotation; and rotating about their own axes such thread-advancing members as are rotatable.

6. A method of initially winding thread on a thread store device of the type comprised of a pair of spaced thread-advancing members mounted about inclined axes which are adapted to advance axially thereof thread wound about said thread-advancing members comprising the steps of rotating said thread-advancing members about an axis extending longitudinally thereof, meanwhile winding the thread about said thread-advancing members in a plurality of closely wound turns at a point remote from the point from which the thread is to be discharged from said thread store device, and thereafter instituting the normal thread-advancing operation of said thread store device.

7. A method of initially winding thread on a thread store device of the type comprised of a plurality of spaced longitudinally extending thread-advancing members, at least two of which are in inclined relation, adapted by rotation of at least one thereof about its own axis to advance longitudinally thereof thread wound about said thread-advancing members comprising the steps of rotating said thread-advancing members about an axis extending longitudinally thereof; causing the thread to wind for one or more complete turns about said thread-advancing members at a point thereon remote from the point at which the thread is to be discharged from said thread store device; discontinuing such rotation; causing the leading end of the thread to engage said

own axis to advance in a plurality of generally helical turns thread wound about said thread-advancing members; means for initially rotating said frame, together with said thread-advancing members, about an axis extending longitudinally of said thread store device; and means for supplying thread to said thread store device from a point fixed with respect to the locus described by said thread-advancing members during the initial rotation thereof.

14. A thread store device as described in claim 13 in which said rotatable thread-advancing member and at least one other thread-advancing member are in inclined relation.

15. A thread store device as described in claim 13 in which said thread-advancing members are supported from one end only of the thread store device, the other end thereof being free and unobstructed.

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