Nov. 24, 1931. D. AUDINO 1,832,850

SPOOL RACK

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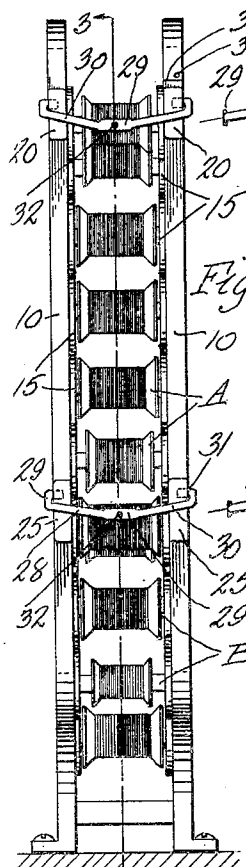


Fig. 1.

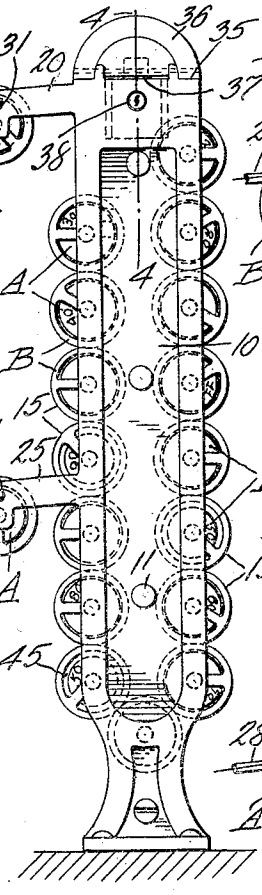
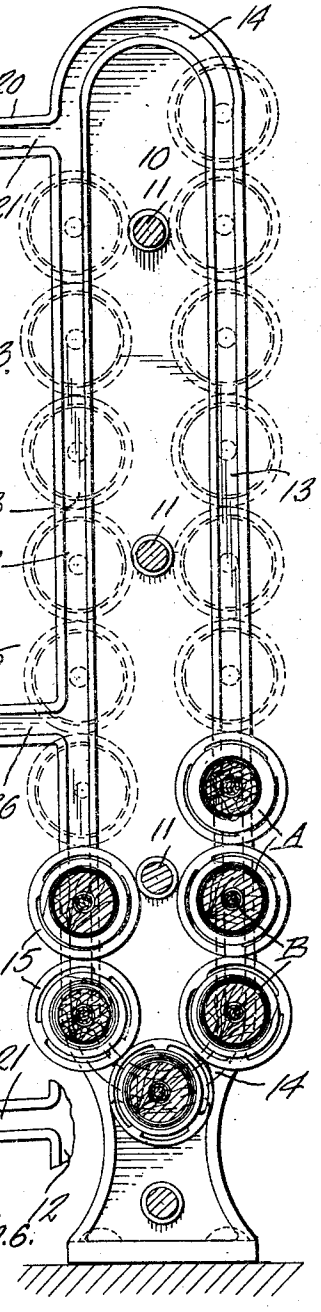


Fig. 2.



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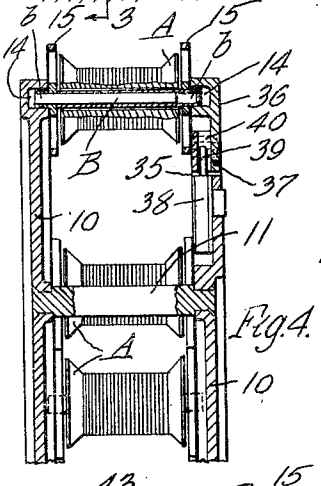


Fig. 4.

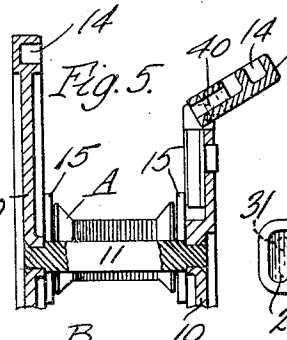
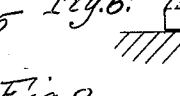


Fig. 5.



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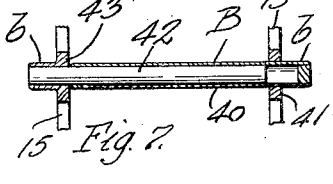

Fig. 7.

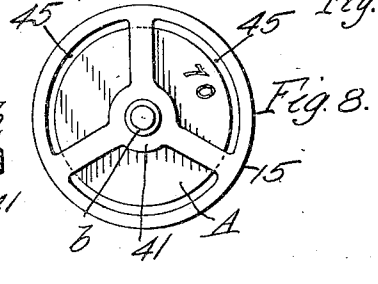

Fig. 8.

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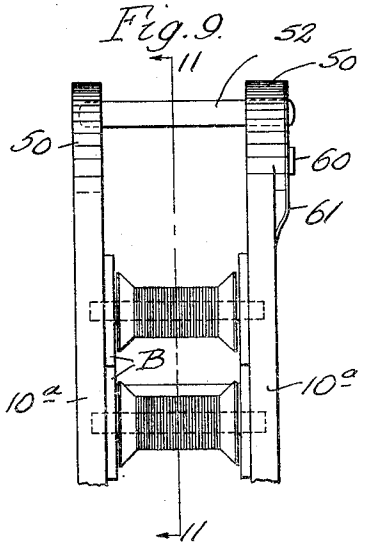
Fig. 9.



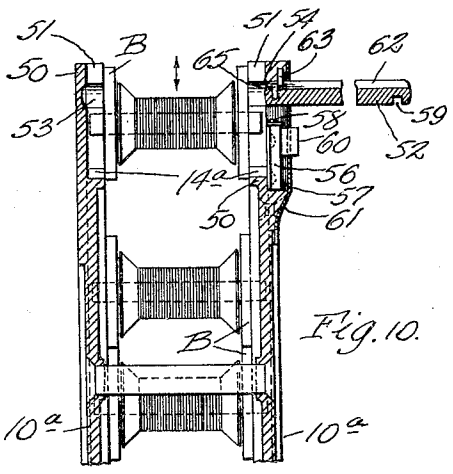
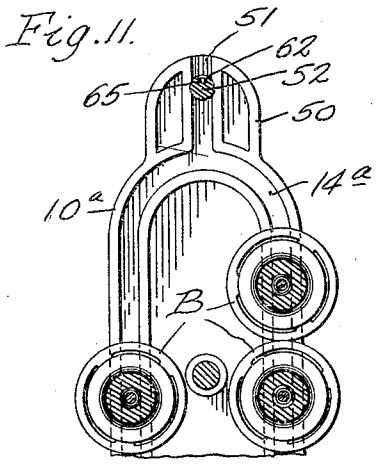


Fig. 10.

Fig. 11.



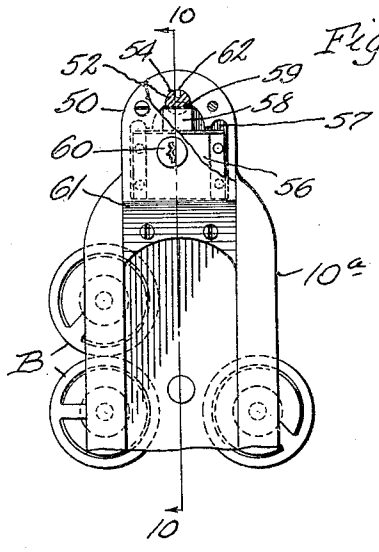


Fig. 12.

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UNITED STATES PATENT OFFICE

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SPOOL RACK

Application filed December 4, 1929. Serial No. 411,447.

This invention relates to improvements in spool racks, or supports of the sort used for supporting a plurality of spools of thread, or the like in an orderly arrangement to enable thread from any one or more of the spools to be delivered to a sewing machine or other objective. The use of such racks permits a relatively large number of spools to be supported in convenient position to enable a desired thread to be readily selected for use. For instance in garment factories it is frequently necessary to use sewing silk of different colors or different kinds on successive garments or portions of a garment being sewed in a given machine, and it is desirable to have the different spools of silk accessibly disposed, so that the operator can quickly supply the sewing machine with the required thread. Such a rack also prevents the threads from being soiled or tangling, and by providing means for locking the spools in the rack, prevents the unauthorized detachment of the spools therefrom, avoiding loss or theft.

The objects of the invention are to provide an improved spool holder or rack of simple and rugged construction formed to support a relatively large number of spools in compact order while occupying itself a relatively small space; also to provide a rack or support of this character on which a plurality of spools can be mounted, so that any one of the spools can be moved to a common operative position from whence uniform delivery of the thread can be had; also to provide an improved rack in which the spools are supported side by side, and which permits collective movement of all of the spools thereon to enable any spool to be removed for replacement by another spool, or a selected spool to be brought to a predetermined operative position; also to construct a spool rack in which the spools are arranged side by side in a row, and which permits one or more selected spools to be shifted out of said row to an operative position; and also to provide a spool rack having a plurality of individual spool spindles and a guideway in which the spindles are loosely mounted to move along the same, and to provide means permitting the spindles to be shifted out of said guideway for placing a selected spool in operative position.

Other objects are to provide a spool rack having improved and simplified means for locking or securing the spools in place on the rack and which means can be readily actuated to permit insertion or removal of the spools; also to provide a rack having individual spool spindles of novel construction for rotatably supporting the spools; also to provide the rack with a series of spool spindles which, while being all of the same size and construction, are adapted to support spools of different lengths; and also to provide the rack with spindles for this purpose which are constructed so that the operator can readily see the size and color numbers or designations of the thread on the ends of the spools while in place on the rack.

Other objects are to construct a spool rack in which a number of spools are loosely mounted, and which permits two or more spools to be shifted and supported in operative positions whereby a corresponding number of threads may be simultaneously delivered to different points; and also to improve spool racks in the other respects hereinafter set forth and claimed.

In the drawings.

Figure 1 is a front elevation of a spool rack illustrating an embodiment of the invention;

Figure 2 is a side elevation thereof;

Figure 3 is a vertical cross section thereof, on an enlarged scale on line 3—3 Fig. 1;

Figure 4 is a fragmentary vertical section thereof, on an enlarged scale, on line 4—4 Fig. 2;

Figure 5 is a similar view showing one form of locking means for permitting the insertion and removal of the spools and spool spindles, in released position;

Figure 6 is a fragmentary side elevation of a seat in which a spool spindle is rotatably mounted for supporting a spool in operative position;

Figure 7 is a longitudinal section of one of the individual spool spindles;

Figure 8 is an end elevation of one of the

spool spindles with a spool mounted thereon, detached from the rack.

Figure 9 is a front elevation of the upper end of a spool rack having locking means of modified construction for permitting the insertion and removal of the spools from the rack;

Figure 10 is a vertical section thereof, with the locking means in spool releasing position, on line 10—10, Fig. 12;

Figure 11 is a vertical cross section thereof on line 11—11, Fig. 9, and

Figure 12 is a side elevation thereof, partly in section.

In the illustrated embodiment of the invention, the improved spool rack comprises a pair of spaced frame members 10 rigidly secured together by means of a plurality of spacing rods or members 11 of suitable construction.

These frame members 10 are preferably in the form of narrow upright plates or castings, each of which is provided with an inwardly facing peripheral guide groove or channel 12, preferably of endless or continuous form including opposite, relatively elongated upright parallel side portions 13 connected by upper and lower transverse end portions 14 of semi-circular or other form.

Means are provided for mounting a plurality of spools A on the rack, so that they extend transversely of and are retained between the frame members 10 with their axes disposed horizontally and parallel, one with the other, as shown in Figures 1–3.

For this purpose, each spool A is mounted on an individual spindle or support B of such length and construction that its opposite ends *b* form journals extending into the opposed channels 12 on the frame members, and are slidable lengthwise thereof.

Preferably each of the spindles B is provided adjacent its ends or journals *b* with circular enlargements, rollers, or spool retaining parts 15, so spaced that when a plurality of these spindles are mounted on the rack, they will be disposed side by side or in a row with the peripheries of said rollers 15 in contact, with the spools A disposed between said flanges.

It will be seen from the foregoing that when a plurality of the spindles B with the spools A are mounted on the rack, the entire series of spindles and spools may be shifted lengthwise along or around the guideways 12, so as to bring any desired spool to a required position.

Preferably the rack is provided with means enabling any selected spool shifted in this manner to be supported in a common operative position. In the construction shown for this purpose, the frame members or uprights 10 are provided with a pair of opposed projecting arms 20 each having formed therein a lateral guide portion or channel 21 which communicates with the guide channels 12 in said uprights, and are formed to receive the journals *b* of a spool spindle B. When, therefore, it is desired to place a particular spool into operative position, this spool may be grasped by the operative and by exerting pressure thereon in a direction lengthwise of the guide channels 12, the remaining spools A on the rack may be displaced, their spindles B sliding along said guideway until the selected spool is brought opposite the lateral arms 20, whereupon the journals *b* of its spindle B may be guided into the lateral channel portions 21 in said arms.

The outer ends of the lateral guide channels are preferably formed with depending portions or seats 22 for receiving and rotatably supporting the ends *b* of a spindle, so that a selected spool A can be maintained in an operative position and prevented from shifting back into the guideways 12 of the rack while in use.

While one thread is being delivered to and used on a sewing machine, for example, it is desirable that another thread be delivered to and wound on a bobbin by the same machine, or for any other desired use.

For this purpose the spool rack can be provided with one or more additional pairs of opposed lateral projections 25, similar to the projections 20, and which are provided with channel portions 26 communicating with the guide channels 12 and terminating in seats 27. By this arrangement, one or more spools A mounted on the individual spindles B, can be selected from the group of spools on the rack, shifted to and operatively supported in said seats.

In order to guide and tension the thread or threads being delivered for use, the spool rack may be provided with suitable guide and tension devices, preferably associated with each pair of lateral projections 20 or 25. Two of such devices are shown for this purpose, each of which comprises a transversely extending bail or member 28 having an intermediate transverse portion 29 and opposite side arms 30. The opposite ends of the device are loosely pivoted in holes 31 in said laterally projecting arms, and preferably above the seats 22 or 27. The transverse portion 29 is provided with a small hole 32 through which the thread from the adjacent operatively mounted spool is passed. The transverse portion 29 of the bail or device is located at some distance from its pivotal connections 30 so that the weight of the member acts to tension the thread.

Any suitable means may be provided to permit the spools A, each mounted on their individual supports or spindles B, to be placed in or removed from the spool rack, and securely retained against unauthorized removal or displacement therefrom. For example, in the construction shown in Figs. 2,

4 and 5 one of the frame members 10 is divided transversely near its upper ends, as at 35, so as to provide a movable portion 36 which is hinged to the remaining stationary portion at 37 to swing outwardly relatively to the latter. A lock or other securing device 38, preferably arranged in the stationary part of this upright 10 is provided with a vertically movable bolt or latch member 39, see Fig. 4, which, when the movable member is in upright operative position, enters a recess 40 therein, and prevents the same from swinging about its hinge relatively to the stationary part. The upper portion 14 of the guide channel 12 is formed in said movable frame portion 36, and is continuous with the upright side portions 13 of this guide channel in the stationary part of the frame member 10. Thus, by unlocking the movable member 36 and swinging the same about its hinge 37, as shown in Fig. 5, the spool spindles with or without the spools thereon can be readily inserted into or removed from the guide channels 12 of the rack.

In the modified construction shown in Figs. 9–12, the upright side members 10*a* are formed or provided with projections 50 at their upper ends. Each of these projections is formed with a groove or channel 51 extending from the outer edge thereof to and in communication with the guide grooves 14*a* in which the spool supports B are arranged.

The grooves or channels 51 are normally obstructed by a transversely extending locking rod or member 52, one end of which is received in a closed seat 53 in one of the members 10*a*, while the other end is received in a hole 54 extending through the other member 10*a*. The rod or locking member 52 when in its locking position, as shown in Figs. 9 and 11 in which it extends crosswise of the spool holder effectually prevents the journals of the spool holders from being moved out of the lateral grooves or channels 51.

In order to retain the rod 52 in its spool holder retaining or locking position, a suitable lock 56 is riveted or otherwise rigidly arranged in a cavity 57 in one of the members 10*a* so that the bolt 58 thereof, when projected, can be engaged in a transverse notch 59 in the then adjacent end of said rod 52, thus preventing endwise movement of the rod. The cylinder 60 of the lock extends through a hole in a removable cover plate 61 so as to be accessible for actuating the bolt 58. By actuating the lock 56 the bolt 58 thereof may be retracted from the notch 59, thus permitting the locking rod 52 to be moved endwise to the position shown in Fig. 10, in which position the lateral groove or channel portions 51 are unobstructed, thus permitting the spool holders B to be removed or inserted.

In order to maintain notch 59 of the rod 52 in operative relation to the bolt 58 of the lock, the rod may be provided with a lengthwise groove 62 into which a fixed pin or projection 63 on the spool rack extends. The inner end of the locking rod 52 may be provided with a projection or pin 65 disposed in the slot 62 thereof and which, when the rod is moved to its unlocking position, engages the stationary pin 63 to prevent the rod from being entirely removed. Means of any other suitable construction may be provided for locking the spool holder to retain the spool supports in place thereon and prevent unauthorized removal of the spool supports or theft of the spools.

Since spools of different kinds and sizes of thread often vary in length, it is desirable to form the supports or spindles B so that such different sized spools can be mounted thereon, while at the same time permitting the rollers or flanges 15 of said spindles to be retained in alinement so as to contact one with another, as before described. For this purpose, and to enable the spools to be placed on the spindles between the rollers 15 thereof, each spindle B, see Fig. 7, is made in two sections, one of which includes an axial tube or sleeve 40*a* to which the hub 41 of one of the rollers or flanges 15 is rigidly secured with an end of said sleeve projecting beyond the roller to provide one journal *b* of the spindle. The other part of the spindle comprises an axial rod or portion 42 of a diameter such that it will telescope with said sleeve 40*a*. To this rod 42 is secured the hub 43 of the other roller 15 of the spindle with a part projecting outwardly to form the other journal *b*. When the two parts are telescoped, one within the other, the roller 15 on the rod 42 abuts against the open inner end of the sleeve 40*a*. Thus, the intermediate portion of the sleeve 40*a*, which is of the same length in all of the sleeves, acts as a spacer preventing inward relative movement of the rollers 15 of each spindle, while the rollers 15 in turn are prevented from outward movement, when mounted on the rack, by engagement with the inner faces of the frame members 10. These rollers being disposed between the ends of the spools and said members 10 act to hold the spools out of contact with the latter. Thus, spools A of any length within the limits of the sleeves 40*a* can be accommodated on the spindles B, see Fig. 1, by separating the two parts of a spindle and inserting the tubular portion 40*a* into the hole in a spool A, and then passing the other portion 42 into said sleeve from the opposite end of said spool.

Also by forming the spindles or supports B with the rollers 15 disposed close to the frame members 10, the spindles are prevented from being turned obliquely across the space between said frame members to a position where they might be forced out of the guideways as might be the case, for example, were a

short spool to be mounted on a spindle not provided with the rollers 15.

Another important feature of this construction is that the rollers or parts 15 of the spindles B are made of somewhat greater diameter than that of the largest spool ordinarily used on the spool rack. Consequently, the spools will be held out of contact one with another with their axis uniformly spaced, regardless of varying diameters and lengths of the spools, and the group of spindles on the rack can roll one on another when shifted along the guideway. In this way the desired spools can be selected and brought to operative position with little effort due to the rolling action of the spindles upon each other, particularly when moving transversely across the upper or lower ends of the rack.

It is often the case that when using spool racks or supports of this character that a number of different threads varying only slightly in color and size are present on the rack at the same time, so that it is difficult for the operator to select the correct thread or threads for the work in hand. It is desirable, therefore, to provide means enabling the operator to be able to positively identify the thread on each spool A on the rack as by the size and color numbers or other designations usually present on the ends of the spools. For this purpose, one or both rollers or flanges 15 of each spindle B is made of open or skeleton form, or is otherwise constructed to provide one or more sight openings 45. Thus, by merely rotating a spindle or spool, the size and color numbers on the end of the latter can be brought to view through an opening 45, outwardly of the edges of the uprights 10, as shown in Figs. 2 and 8.

Claims.

1. A spool rack having a plurality of spindles each formed to rotatably support a spool, a guide on which said spindles are arranged and along which they are movable collectively to permit any one of said spools to be shifted to a predetermined operative position, and means for retaining a selected spool in said operative position.

2. A spool rack having a plurality of spindles each formed to rotatably support a spool, a guide on which said spindles are loosely arranged and along which they are movable collectively, and said guide having an offset portion into which any one of said spindles can be diverted to dispose the spool thereon in operative position.

3. A spool rack having a plurality of spindles each formed to rotatably support a spool, a guide on which said spindles are loosely arranged in a row side by side and along which they are movable collectively, and said holder having a fixed part associated with and formed to receive any one of said spindles from said guide to place the spool thereon in an operative position.

4. A spool rack having an endless guideway, means for supporting a plurality of spools to move collectively along said guideway, and means associated with said guideway for rotatably supporting a selected spool in a predetermined operative position, whereby any one of said spools may be placed in said operative position by shifting said spools along said guideway until said selected spool reaches such position.

5. A spool rack having a plurality of spindles each formed to rotatably support a spool, and an endless guideway in which said spindles are arranged and along which they are movable collectively, a lateral part connecting with said guideway into which any one of said spindles can be moved and support its spool in operative position by moving it along said guideway and displacing the other spindles with their spools therein until said selected spool is brought opposite said lateral part, and then moving its spindle into the same.

6. A spool rack having a plurality of spindles each formed to rotatably support a spool, and an endless guideway in which said spindles are loosely arranged and along which they are movable collectively, whereby any one of said spools with its spindle can be brought to a predetermined position relative to said guide by moving said spools and spindles collectively around said guideway.

7. A spool holder having a plurality of individual spool supports, on each of which a spool is rotatably mounted, a guideway in which said supports are movably disposed, and supporting means on said holder into which a selected spool and its support can be shifted from said guideway and supported in operative position.

8. A spool holder having a plurality of spool supports, on each of which a spool is rotatably mounted, a guideway in which said supports are disposed, and supporting parts on said holder into which one or more of said spools and supports can be shifted from said guideway and supported in a corresponding number of predetermined operative positions, whereby one or more threads can be simultaneously delivered for use.

9. A spool rack having a pair of spaced complementary guideways, a plurality of individual spool supports extending between and loosely engaged in and movable along said guideways, and opposed lateral guide portions in communication with said guideways into which the support of a selected spool can be diverted and supported in an operative position.

10. A spool rack having a pair of spaced complementary guideways, a plurality of individual spool supports extending between and loosely engaged in and movable along said guideways, opposed lateral guide portions in communication with the said guide-

ways into which the support of a selected spool can be diverted, and seats in said lateral guide portions for rotatably supporting said spindle in an operative position.

11. A spool rack having a pair of spaced frame members, a complementary guideway in each of said members, a plurality of individual spool supports extending between said members, each having oppositely extending journals loosely engaging in and movable along said guideways, and each of said frame members having an opposed seat in communication with its guideway into which the journals on the support of a selected spool can be diverted for rotatably supporting said spool in operative position, by shifting said spool and its support along said guideway to a position opposite said seats.

12. A spool rack including a guide, a plurality of spool supports each formed to rotatably support a spool, and arranged on and movable along said guide, whereby a selected spool may be brought to a desired position relative to said guide, and each of said supports having a roller larger in diameter than the spool supported thereon and which is disposed so as to rotatably engage the rollers of adjacent spools when the latter are moved along said guideway, and whereby said spools are held out of contact with one another.

13. A spool rack having a pair of opposed guideways, a plurality of individual spool spindles each formed to rotatably support a spool and having journals loosely arranged in and movable along said guideways, and rollers on each of said spindles at opposite ends of the spool thereon and of a diameter larger than the spool, said rollers being disposed so as to rotatably engage the rollers of adjacent spindles when said spindles are moved relatively to said guideways, and whereby said spools are held out of contact with one another.

14. In a spool rack, a guide, a plurality of spool spindles movable on said guide and each including a part formed to pass through the bore of a spool and having a roller arranged at one end of said spool, and a part formed to telescope with said first mentioned part and having a roller at the opposite end of the spool, and means to limit the movement of said rollers towards each other, whereby said spool is confined between said rollers.

15. A spool rack having a pair of opposed guideways, a plurality of spool spindles each formed to rotatably support a spool, and comprising two separable members formed to telescope one with the other when inserted into a spool from opposite ends thereof, a journal on each member formed to slidably engage in one of said guideways, and each of said members having a roller thereon adjacent an end of said spool and of larger diameter than said end, and stop parts on said members for maintaining said rollers in predetermined spaced relation, whereby the rollers of adjacent spindles on said rack have rolling contact in the movement of said spindles relative to said guideways.

16. A spool rack comprising a pair of complementary guideways, a plurality of spool spindles each formed to rotatably support a spool and which are engageable in and movable along said guideways, said spindles each having a pair of spaced rollers between which a spool is disposed, and at least one of said rollers having an aperture through which an end of a spool may be viewed so that designations on said end of said spool can be ascertained.

17. In a spool rack, a guide, a plurality of spool supports each formed to rotatably support a spool, said supports with the spools thereon being shiftably arranged on said guide to move to different positions, said guide having movable means for enabling said spool supports to be removed therefrom, and locking means which, when locked, prevents movement of said means and the removal of the spool supports and spools, said locking means being operable to release said movable means so that said spool supports may be removed from said rack.

18. A spool rack having a plurality of spool supports, a pair of stationary complementary guideways in and between which said spool supports are rotatably disposed and which are movable along said guideways, a movable part for preventing the removal of said supports from said guideways, means for locking said part in operative position and which part, when unlocked, is movable to a position such that the removal of said spool supports from said rack may be effected.

19. A spool rack having a plurality of spool supporting spindles, and a pair of relatively stationary complementary guideways in which said spindles are rotatably disposed and confined between said guideways but are movable along said guideways, a part movably connected to one of said guideways, means for locking said part in an operative position in which the removal of said spindles is prevented, and said means being operable to release said movable part so that it can be shifted to a position which enables the spool spindles to be placed on or removed from said rack.

20. A spool rack comprising a pair of relatively stationary opposed guides, a plurality of spool supports each rotatably supporting a spool and extending between and movably engaging with said guides, and each of said supports having a transverse enlargement at each end engaging the adjacent guide, whereby said supports are prevented from being turned to a position in which they are disengageable from said guides.

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