May 9, 1933. A. M. GUILLET 1,907,961

METHOD OF JOINING SECTIONS OF ROLLS TOGETHER

Filed Sept. 20, 1930 2 Sheets-Sheet 1

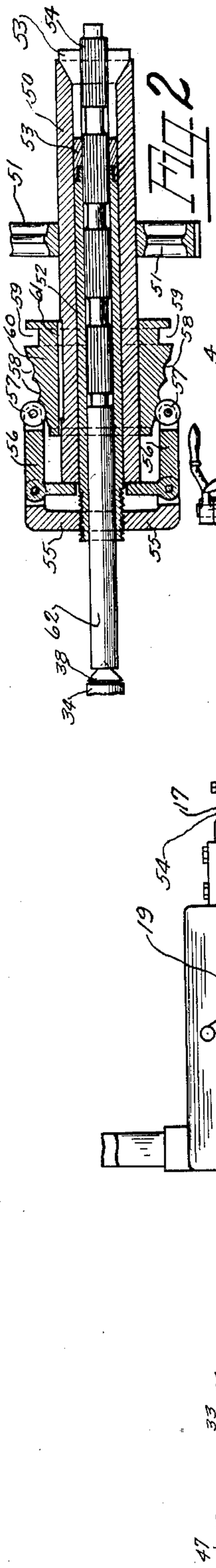

FIG 2

FIG 1

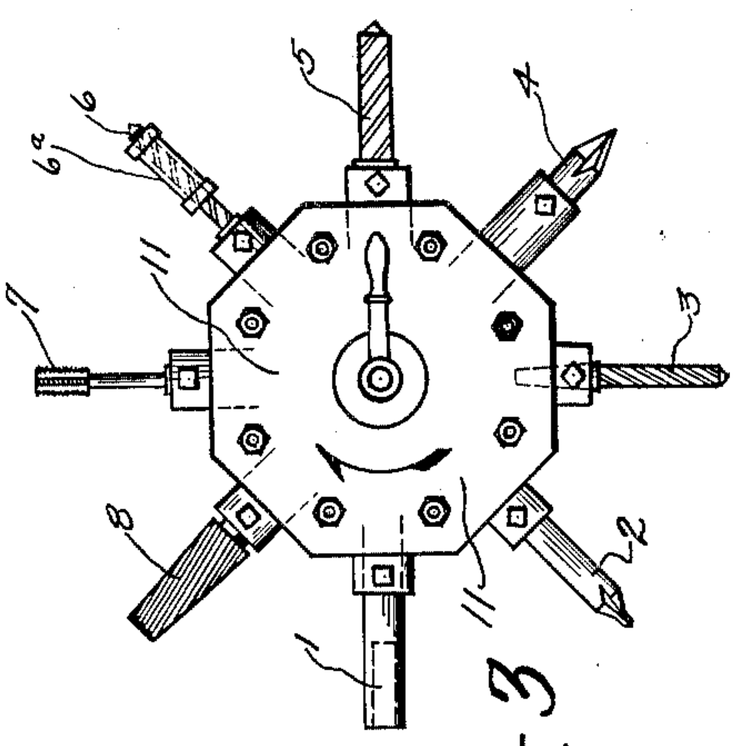

FIG 3

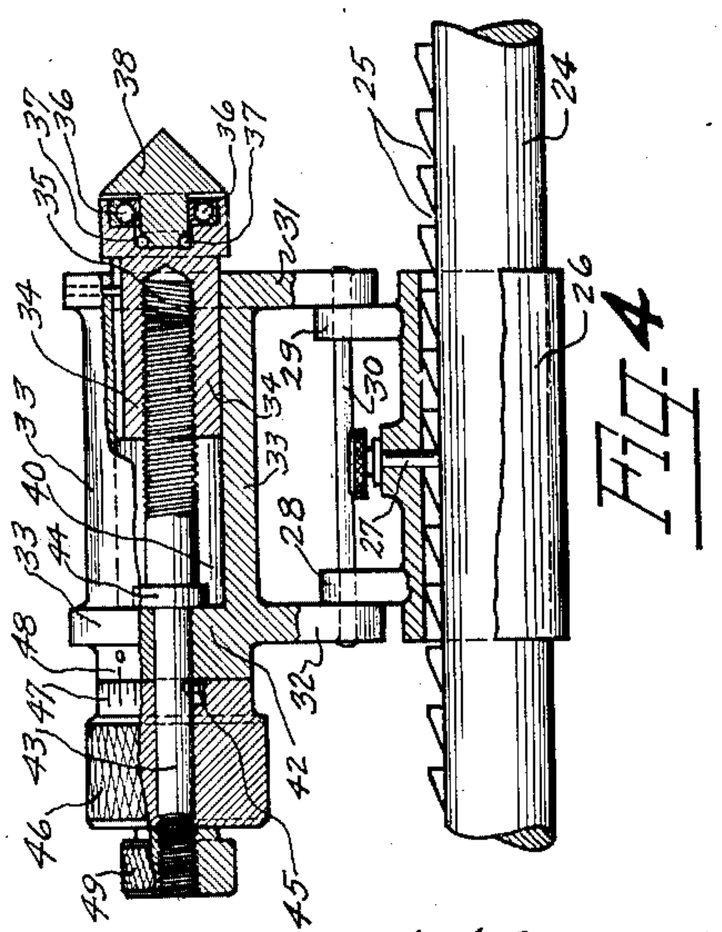

FIG 4

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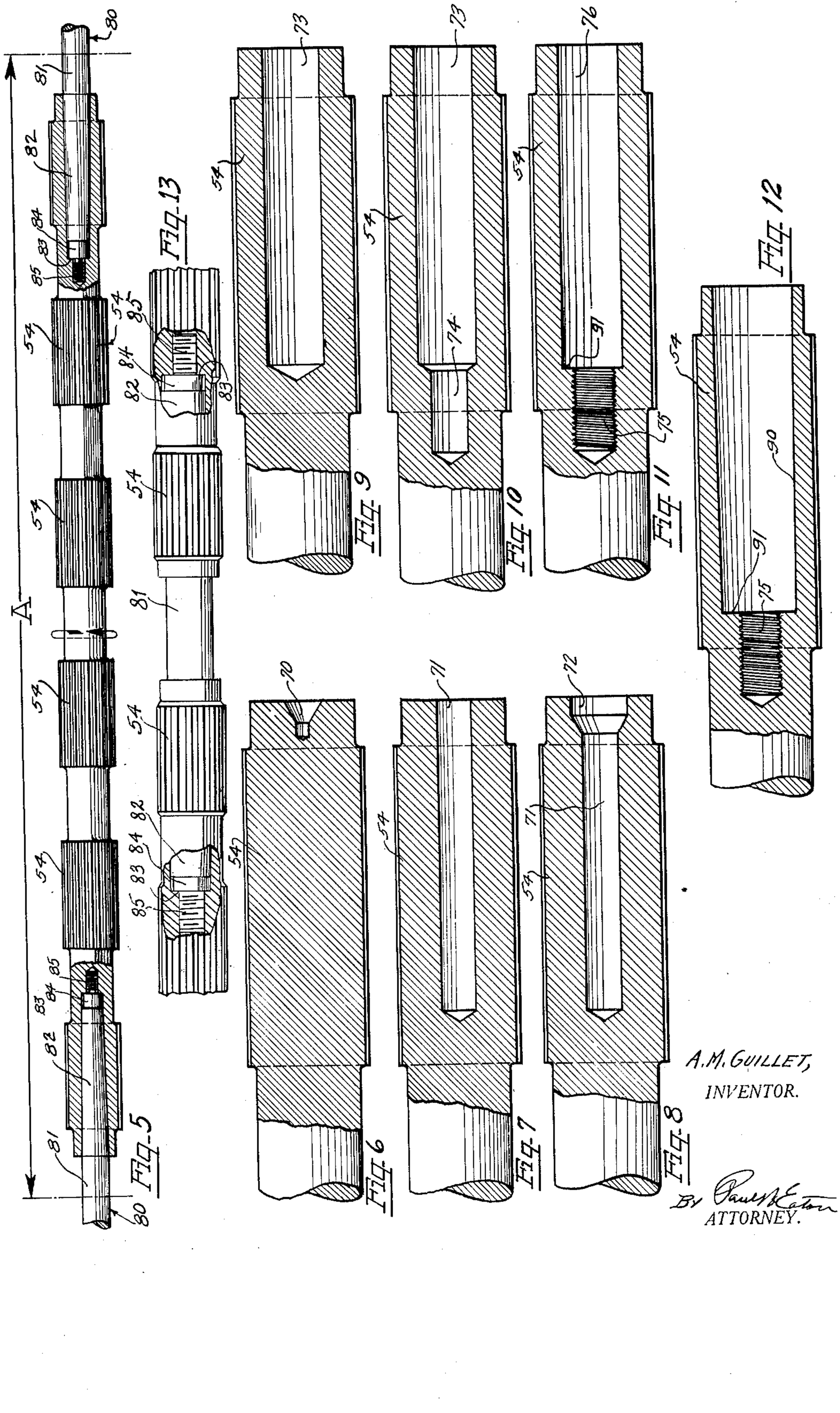

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Patented May 9, 1933 1,907,961

UNITED STATES PATENT OFFICE

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METHOD OF JOINING SECTIONS OF ROLLS TOGETHER

Application filed September 20, 1930. Serial No. 483,194.

This invention relates to an improved method of forming an interchangeable bearing or roller neck in the rolls for spinning frames, roving frames, and the like, and relates to a method of boring out and interiorly threading the end portions of the rolls in such a manner as to insure that the length of the rolls when assembled shall be of a given length from the central bearing portion of one roller neck to the center of the bearing portion of the next adjacent roller neck, regardless of the length of the units or rolls themselves within given limits.

Heretofore, in the repair of rolls for spinning frames, roving frames and the like when the journal or roller necks become worn to the extent of requiring new necks or when the fitting consisting of a square male portion fitting into a female square becomes worn, one method of repair has been the forming of a new square, cutting off the old journal at its junction with the roll, boring out the roll and fitting a new journal into the bore in said roll, and in this way it often happens that the length of the rolls vary from the center of one journal portion to another, and in case said rolls are repaired according to the teachings of my Patent Number 1,659,261, issued on February 14, 1928, there are no means whereby the length from the central point of one roller neck to the central point of the other roller neck will be uniform, and it is an object of my new and improved method to insure that the length shall be uniform, and also that the completed rolls will operate in the same manner, or better, as new rolls, it being one of the objects of my invention to apply this method to the formation of new rolls as well as to the repair of old rolls.

Some of the objects of my invention having been stated, other objects will appear as the description proceeds, when taken in connection with the accompanying drawings, in which—

Figure 1 is a side elevation of a turret lathe used in connection with my method;

Figure 2 is a longitudinal cross-sectional view taken through the upper central portion of Figure 1;

Figure 3 is a plan view of the turret;

Figure 4 is a side elevation, partly in cross section, of my micrometer shown in the left hand corner of Figure 1;

Figure 5 shows a completed roll prepared in accordance with my method;

Figure 6 shows the second step in the operation of preparing the end of a new roll in accordance with my improved method;

Figure 7 shows the third step in preparing new rolls;

Figure 8 shows the fourth step in preparing new rolls;

Figure 9 shows the fifth step in preparing new rolls;

Figure 10 shows the sixth step in preparing new rolls;

Figure 11 shows the seventh step in preparing new rolls;

Figure 12 shows the eighth and last step in my improved method;

Figure 13 shows a complete journal and portions of adjoining rolls.

Referring more particularly to the drawings the numeral 10 indicates the main framework of a conventional turret lathe employed in carrying out my process of joining rolls and other articles together, which turret lathe has a turret 11 rotatably and slidably mounted on the portion 12 controlled by a hand wheel 13, said turret being adjusted as to the stopping point of the various implements by means of the adjusting mechanism 14 comprising a plurality of controls 15.

This turret lathe has an upstanding portion 16 with a cutter member 17 thereon for cutting off the end of the object before commencing an operation, if desired, which is controlled by a hand wheel. A housing indicated by the reference character 19 has the mechanism housed therein illustrated in Figure 2 and hand levers 20 and 21 are used for controlling the operation of the mechanism. This turret lathe has a conventional shaft 24 projecting therefrom with notches 25 therein.

In the housing 19 a conventional spindle 50 is mounted and adapted to be rotated by means of a gear wheel 51 and within this spindle 50 is mounted a sleeve 52, said sleeve having secured on one end thereof a collet

or chuck 53 for holding a roll 54 and on the other end of this sleeve is secured a member 55 which has pivoted levers 56 therein with a roller 57 in one end thereof and the other end of these pivoted levers 56 is adapted to have engagement with the spindle 50 to move the sleeve 52 with relation to the spindle 50 to grip the roll 54.

The rollers 57 are adapted to work in circumferential grooves 58 and in groove 59 of member 60 suitable means (not shown) are provided for moving members 60 along the spindle 50, the member 60 being adapted to rotate with the spindle 50 by means of having a groove therein meshing with key 61.

The sleeve 52 is also adapted to accommodate a rod 62 in one end thereof to fit against the roll 54 and the other end thereof is adapted to press against the live center 38.

On shaft 24 is adjustably mounted cuff 26 which has a pin 27 for adjusting the same along the notches 25 and this cuff 26 has lugs 28 and 29 thereon in which is mounted a pin 30 and on this pin 30 is pivotally mounted lugs 31 and 32 projecting from casing member 33 in which is rotatably mounted a live center member 34 which is interiorly threaded as at 35 and has thrust bearings 36 and 37 therein with a spindle 38 rotatably mounted in said thrust bearings, the member 34 having longitudinal movement in a cavity 40 and the said casing 33 has the rear end thereof closed as at 42 except for a hole therein in which a shaft 43 is mounted, this shaft 43 having an enlargement 44 thereon to limit the rearward movement of the shaft 43 and this shaft 43 has pin 45 therein which is adapted to engage a corresponding cavity in member 46 which has graduation 47 thereon adapted to be read by means of an indication 48 on the member 33 and on the end of the shaft 34 is threadably mounted a lock nut 49 for purposes of locking the device in adjusted position.

The turret 11 has a plurality of tools therein comprising the stop 1, the centering tool 2, the lead drill 3, the truing instrument 4, with the large drill 5, the tap drill 6, the tap 7, the reamer 8. The tap drill 6 has the collar 6*a* slidably mounted thereon, to cause the same to be disposed in the center of the hole made by the drill 5.

With the above described apparatus, a new roll 54, having its ends unbored, is placed in the sleeve and held in rigid position by means of the sleeve 52 being moved with relation to the spindle 50 but before said roll is gripped in position the turret 11 is moved forward to cause the stop 1 to engage the end of roll 54 to press it back to a certain definite point and when this has taken place the roll is gripped in position by moving the spindle with relation to the sleeve and when the roll has been placed in proper position and gripped therein a centering tool 2 is forced against the end of roll 54 and a cavity 70 is formed by means of the centering tool 2 and then the turret is given another partial rotation and a lead hole 71 is drilled by means of a lead drill 3 and then the turret is given another one-eighth rotation and a truing hole or cavity 72 is drilled in the end of the roll by means of tool 4 and then the turret is given another one-eighth rotation to drill a large bore 73 with tool 5 preferably a three-groove drill and then the turret is given another one-eighth rotation to use tool 6 for drilling a tap hole 74 and then the turret is given another one-eighth rotation to tap the said hole 74 by placing thread 75 therein with a tool 7 and then the turret is given another one-eighth rotation and a reamer 8 is used to mill out a cavity 76 and the operation is completed for this end of the new roll. During the above-described operation shaft 62 is not used.

When one end of the roll has been completed the said roll is removed from the machine and reversed to cause the completed end of the roll to fit against end of shaft 62 and the above operation is repeated for the other end of the roll.

Before the first operation for boring the last end of the roll has commenced the turret is advanced forward and the stop member 1 pushes the roll against the end of shaft 62, whose other end is resting against the live center 38.

The position of live center 38 is adjusted to cause the same to fit against shaft 62 when the roll is stopped in proper position at the beginning of the operations on the second end of the roll.

In case a short roll occurs the boring operation performed on the end of the roll which is last operated upon will be shallower than the boring operation for the first end of the roll and in case the roll is longer than a conventional roll then the boring operation will proceed to a deeper point in the end of the roll last bored so that in all cases the distance from the central point of one journal member 80 to the central point of the other journal member 80 will be uniformly the same so that when rolls are prepared according to my method that the same can be assembled to fit into a spinning frame, roving frame and the like to cause the bearing portions 80 to fit perfectly in the roll stands as it is sometimes the case that these rolls are as long as forty feet.

The member 80 comprises a journal portion 81 adapted to fit into the roll stand bearing with sloping portions 82 and shoulder portions 83 with a cutaway portion 84 at each end to prevent binding of the same in the cavity, and a threaded portion 85 at each end thereof.

The sloping portions 82 are adapted to fit against sloping side-walls 90 of the cavities

76 and the shoulders 83 on journal member 80 are adapted to fit against the shoulders 91 in the face of each of the sloping cavities 90 and the threaded portions 85 on each end of the journal member 80 are adapted to engage the threads 75 in the roll 54.

The cutaway portion 84 is provided to prevent any binding of the sloping portion 82 of member 80 in the sloping part of cavity 90 so as to cause a perfect fit between the sloping portion 82 and the sloping portion 90. Also it is apparent that the shoulder 83 fitting against shoulder 91 limits the inward movement of journal member with relation to the end of the roll so as to prevent swelling of said roll and thus permitting the same to be assembled to provide a long section of rolls in which the distance from one center point of the bearing portion to the other center point of another bearing portion shall be uniform.

The above described operation has been limited solely to the preparation of new rolls for drawing frames, spinning frames, roving frames and the like and of course it is evident that old rolls can be prepared in a similar manner. As is well known, the conventional roll heretofore, has consisted of several sections in which the journal portion is integral with one end of the roll and is squared and this squared portion fits into a female squared portion in the end of the next adjacent roll and as previously stated, the journal portion becomes worn and also the fit between the male and female members becomes loose requiring that the rolls be re-necked and in carrying out this operation according to my improved method of course the first operation would be to saw off the journal portion adjacent the first boss and then to take the old roll and place it into the lathe and advance the turret member until the stop member 1 places the roll in proper position at which time the roll would be secured in position by means of the collet or chuck and then instead of using the centering tool 2 in the turret the tool 4 would be used to center the squared female opening and then tool number 5 would be used to mill out the cavity similar to that shown in Figure 9 and then tool number 6 would be used, then tool number 7 and finally tool number 8, it being evident that in milling out the female end of the old roll that tools number 2 and 3 would not necessarily be used.

After the old roll has been milled out as above described of course the roll would be reversed and the other end of the roll treated in the same manner as previously described for new rolls, as this end of the roll would be solid and all of the various steps as described for new rolls would be carried out on the last end of the old rolls.

In the drawings and specification I have set forth a preferred embodiment of my invention, and although specific terms are employed, they are used in a generic and descriptive sense only, and not for purposes of limitation, the scope of the invention being set forth in the appended claims.

I claim:

1. That method of joining sections of rolls for spinning frames, roving frames and the like, together with roller necks which comprises placing the roll in a holding device and adjusting the holding device to hold the roll in a fixed position, then forming a center cavity in one end of said roll, then boring an extended lead hole a predetermined distance into the roll, then forming a truing hole in the opening made by the previous bore, then forming a larger bore of approximately the same depth of the lead bore, then forming a tap bore in the bottom of the previous bore, then forming threads in the tap bore, then reaming the large bore to its junction point with the tap bore to form a shoulder at the junction point of the tap bore and larger bore and to form said larger bore with gradually decreasing cross-section as its depth proceeds, then removing the roll from its holder and reversing its end and securing it in the holder in the same position as previously occupied and repeating the above set forth operations on its other end to form a bore within a predetermined distance from the base of the bore in the other end of the roll, then joining adjacent rolls together with a roller neck formed to fit the bore in the rolls.

2. That method of joining sections of rolls for spinning frames and the like together by interposing a roller neck between sections of rolls, which comprises milling a tapered cavity in one end of the roll to a predetermined depth, providing a bottom surface to said cavity at right angles to the axial center of said tapered cavity, providing a threaded cavity extending from said bottom deeper into said roll, then performing a like operation on the other end of the roll and at the same time limiting the depth of millings to a definite distance from the other end of the roll, then joining sections of rolls together by a journal adapted to fit all portions of said millings in the ends of the rolls.

In testimony whereof I affix my signature.

ALBERT M. GUILLET.