

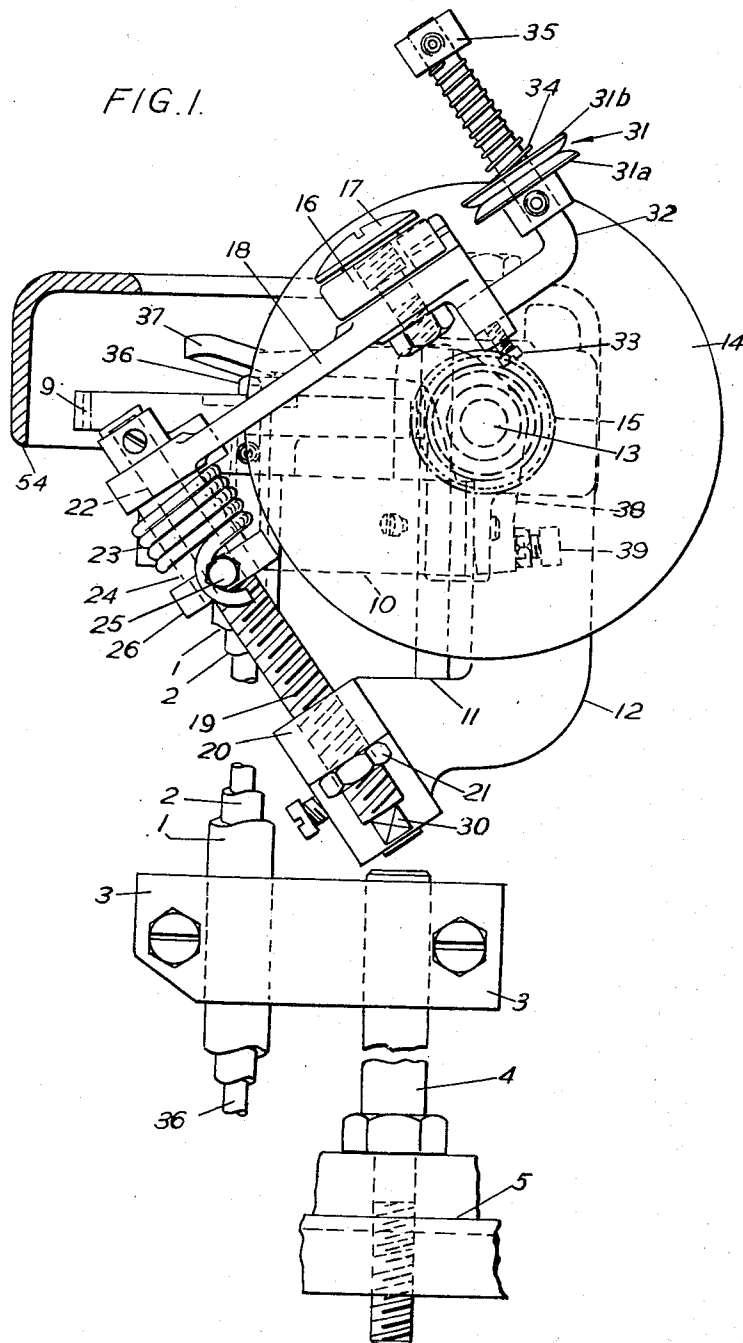
Jan. 26, 1954

C. F. MANGER
YARN FURNISHING DEVICE

2,667,266

Filed Oct. 24, 1950

5 Sheets-Sheet 1



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FIG. 2.

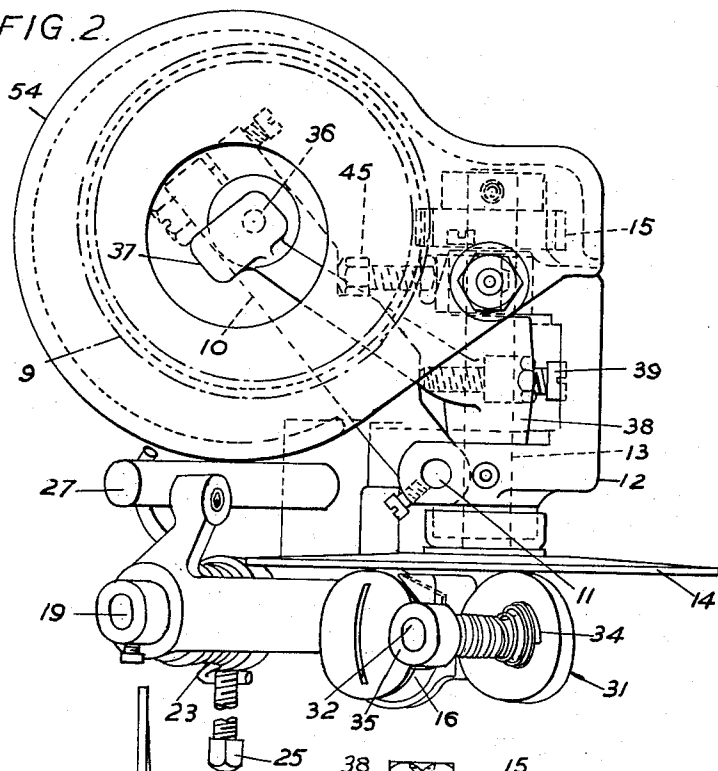
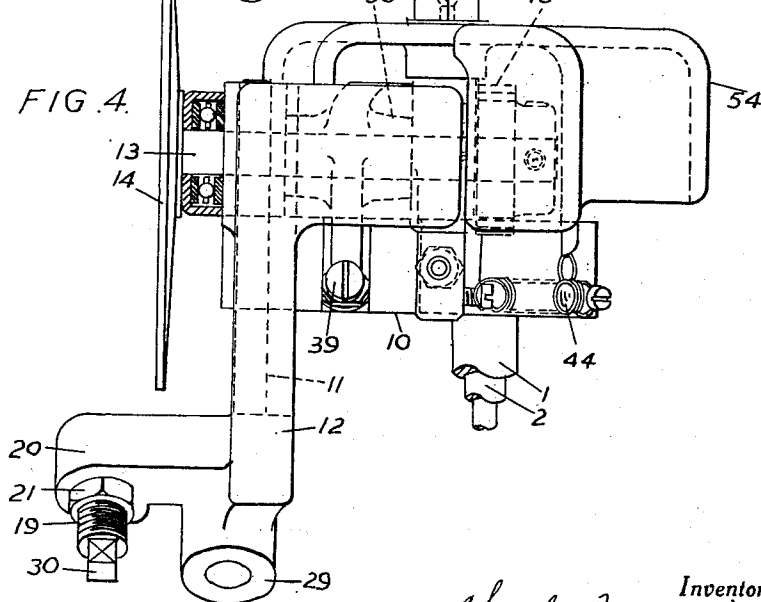


FIG. 4.



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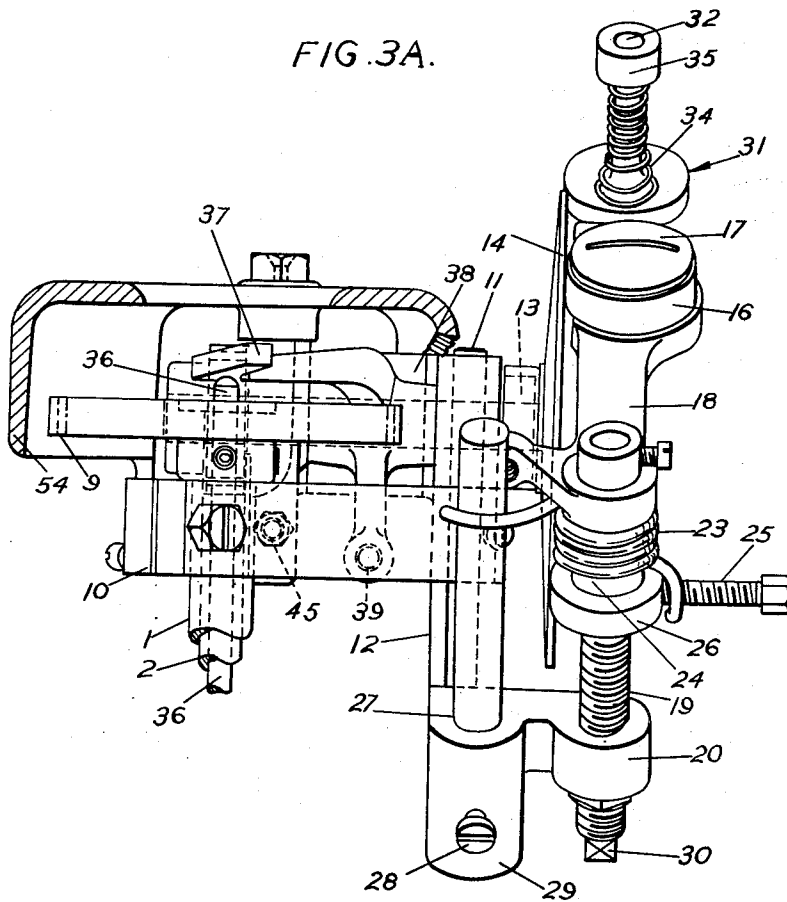
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FIG. 3A.



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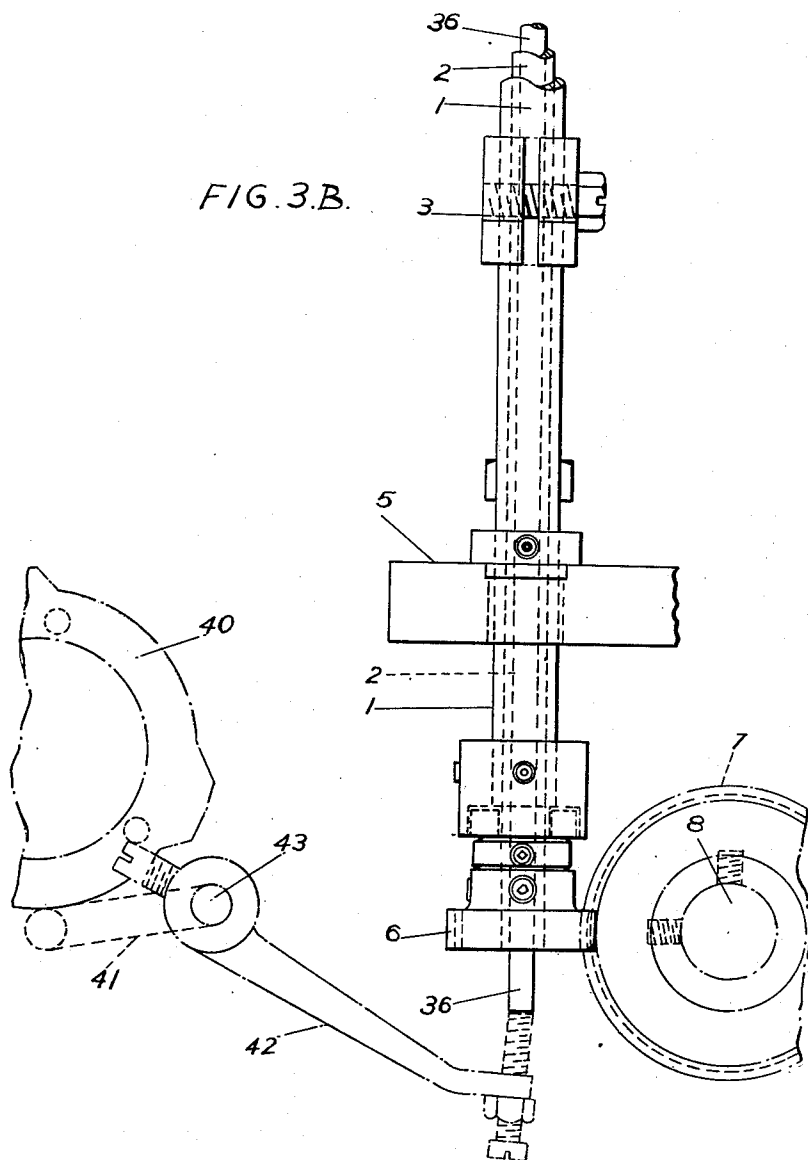
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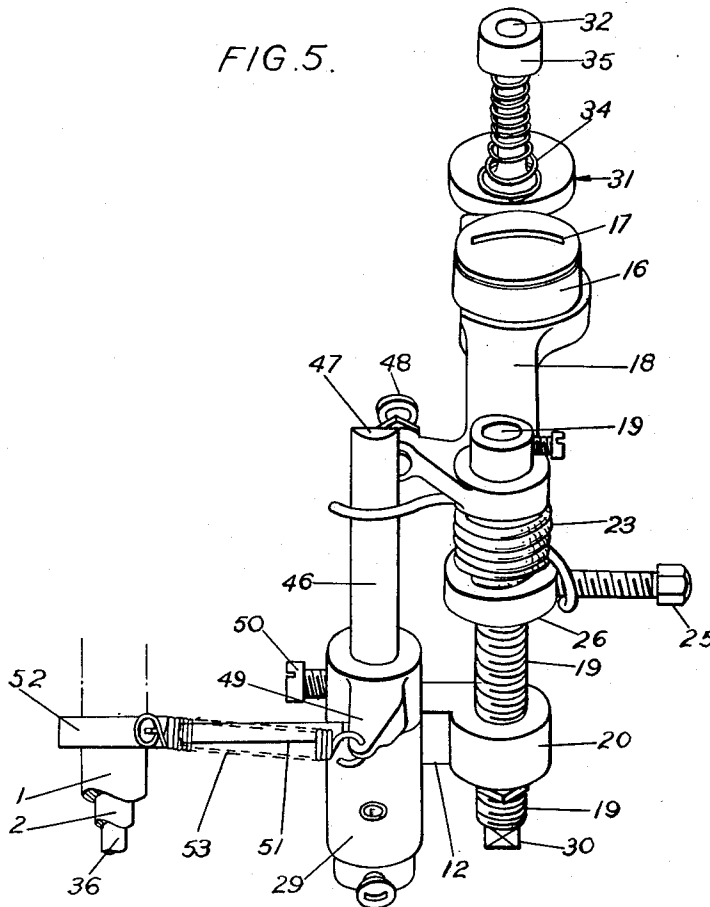
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FIG. 5.



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UNITED STATES PATENT OFFICE

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YARN FURNISHING DEVICE

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Application October 24, 1950, Serial No. 191,780

Claims priority, application Great Britain
 October 29, 1949

15 Claims. (Cl. 203—200)

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This invention is an improved yarn furnishing device for textile machines and its chief object is a construction of yarn furnishing device which is particularly well suited for use, on circular knitting machines, for feeding elastic yarn (either covered or uncovered) to the needles, such yarn being either knitted by the needles or incorporated in the fabric without being knitted.

Unless special precautions are taken to avoid it, difficulty will be experienced in incorporating or knitting elastic yarn in tubular knitted fabric owing to the fact that, for various reasons, the yarn is not drawn off the bobbin or other wound supply with an even tension. To overcome this difficulty proposals have already been made for a yarn furnishing device comprising two rotary furnishing members which feed the yarn between them and of which one is movable over the surface of the other in order to vary the rate of feed of the yarn according to their relative positions. Such a device has included means for driving one of these members and a yarn tensioning device to tension the yarn before it enters between the furnishing members.

The present invention comprises a modified form of such a device and includes, broadly, the combination of a rotary furnishing disc, a rotary furnishing roller cooperating with the face of the disc to grip the yarn, means for adjusting the roller towards and away from the center of the disc to vary the rate of yarn feed, a pair of meshing gears for driving the disc a bracket mounted for movement towards and away from one of the gears, a spindle in the bracket carrying the disc and the other gear, and means to move the bracket in order to disengage the gears.

It is obvious that in place of a flat disc the same object can be achieved when that disc is replaced by a conical surface, generally a shallow conical surface. Where a disc is referred to herein and in the claims it is to be understood that such a conical surface is also included.

The foregoing and other features of the invention set out in the appended claims are incorporated in the yarn furnishing device which will now be described by way of example with reference to the accompanying drawings in which:

Figure 1 is a front elevation and Figure 2 is a plan of the device:

Figures 3A and 3B are side elevations of the device, showing its driving connections and the mechanisms for moving the gears out of mesh;

Figure 4 is an opposite side elevation of a portion of the device;

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Figure 5 shows a modification to be made to the device for the purpose of feeding bare elastic.

The device shown in Figures 1-4 is primarily intended for use, in a circular knitting machine, for feeding covered elastic yarn. It comprises a support 1, housing a hollow driving shaft 2 which for convenience in description will be considered as being vertical. This support 1 is adjustably fixed by a clamp 3 to a post 4 on the table or other convenient part 5 of the knitting machine. At its lower end the shaft 2 is provided with a bevel or other gear 6 by which it may be driven from a gear 7 on a running shaft 8 of the machine, and at its top end is provided with skew or helical gear 9 for a purpose hereinafter described.

At the upper end of the support 1 there is a clamp 10 carrying a fixed spindle 11 the axis of which is parallel to that of the vertical shaft 2. Pivotaly mounted on this spindle 11 for rocking movement is a bracket 12 carrying a horizontal spindle 13 having a disc 14 at one end and a helical gear 15 at the other. The gear 15 is driven by the helical gear 9 secured to the upper end of the vertical shaft 2.

The disc 14 constitutes one of the furnishing members and a roller 16 constitutes the other, the yarn being gripped between the surface of the disc and the periphery of the roller. A ball bearing of the ordinary commercial type is used for the roller 16 and this is mounted on a pin 17 which is secured to a lever 18 carried by a screw 19. The latter is screwed through the boss 20 of the bracket 12 and locked by locknut 21. The lever 18 is mounted on a plain part 22 of the screw 19; a spring 23 encircles its boss 24 and is anchored at one end by the screw 25 in the collar 26 also mounted on the boss 24 of the lever 18. The other end of the spring 23 engages a rod 27 which is fixed by a screw 28 in another boss 29 of the bracket 12. The spring 23 thus urges the roller 16 towards the disc 14 to create sufficient pressure to grip the yarn between the roller and the disc. The degree of pressure is adjusted by partial rotation of the collar 26 round the boss 24 of the lever 18 and by locking it in the desired position with the screw 25.

The rate of feed of the yarn is adjusted by turning the screw 19 by means of its squared end 30, provided for this purpose, to bring the roller 16 nearer to, or farther from, the centre of disc 14. The disc 14 rotates at a constant speed, being driven from the machine, and consequently the yarn will be fed respectively slower or faster

according to whether it makes contact with the disc nearer or farther from the centre.

The lever 18 also carries an adjustable tensioning device 31 so placed that the yarn passes through the device before passing between the roller and the disc. This device 31 is carried on a rod 32 secured in a hole in the lever 18 by the screw 33 and consists of a pair of coaxial tension discs or cymbals 31a, 31b between which the yarn passes and which are pressed together by the spring 34, the pressure of which is adjustable by moving the collar 35 along the rod 32.

In order to interrupt the drive of the furnishing disc 14 when it is desired to stop the elastic feed the two helical gears 9 and 15 are thrown out of mesh. For this purpose the hollow shaft 2 contains a push rod 36 the top end of which bears against a head 37 on one arm of the bell-crank lever 38 which is pivoted on the spindle 13 and has its other arm engaged, through the adjusting screw 39, with a face of the fixed clamp 10. Thus when the control cam 40 (Figure 3B), acting through the levers 41 and 42 on the shaft 43, raises the push rod 36, the bracket 12 is swung about the spindle 11 and disengages the gears. The spring 44 urges the gears into mesh and the extent to which they mesh is adjusted by the screw 45.

When the yarn furnishing device is being used to feed uncovered elastic yarn, it is desirable to release the grip exercised on the yarn by the roller 16 and the furnishing disc 14 as the drive of the disc is interrupted. For this purpose the modification illustrated in Figure 5 is made. The rod 27 is removed and replaced by a rotatable rod 46 having a flat face 47 and the lever 18 is provided with a tappet screw 48 which bears against the flat face 47 on the rod 46 which is rotatably mounted in the boss 29. The arm 49 is attached by a screw 50 to the rod 46 and a rigid strut or abutment in the form of a push rod 51 engages the arm 49 at one end and an abutment 52 on the support 1 at the other. A spring 53 maintains contact between the push rod and the arm and the abutment and when the bracket 12 rotates about the spindle 11 to disengage the disc driving gears the boss 29 carrying the rod 46 moves toward the support 1 and so, through the action of the push rod 51 on the arm 49 the rod 46 is caused to rotate. The latter therefore acts on tappet screw 48 and swings lever 18 about pivot screw 19 so as to lift the roller 16 away from the surface of the disc 14.

Preferably, but not necessarily, the gears 9 and 15 are concealed by a cover 54 mounted on the bracket 12.

What I claim is:

1. A yarn furnishing device comprising the combination of a rotary furnishing disc, a rotary furnishing roller cooperating with the face of the disc to grip the yarn, means for adjusting the roller towards and away from the center of the disc to vary the rate of yarn feed, a pair of meshing gears for driving the disc, a bracket mounted for movement towards and away from one of the gears, a spindle in the bracket carrying the disc and the other gear, and means for moving the bracket in order to disengage the gears.

2. A yarn furnishing device comprising the combination of a rotary furnishing disc, a rotary furnishing roller cooperating with the face of the disc to grip the yarn, means for adjusting the roller towards and away from the center of the disc to vary the rate of yarn feed, a pair of meshing gears for driving the disc, a bracket

pivoted for movement about an axis parallel with the axis of one of the gears, a spindle in the bracket carrying the disc and the other gear, and means for rocking the bracket in order to disengage the gears.

3. A yarn furnishing device according to claim 2 in which the gear having its axis parallel with the pivotal axis of the bracket is the driving gear, and the other gear carried by the disc spindle is the driven gear.

4. A yarn furnishing device according to claim 1, in which the roller is also carried by the bracket that carries the disc.

5. A yarn furnishing device according to claim 1, having the roller also carried by the bracket that carries the disc, and having means for tensioning the yarn before it enters between the disc and roller supported in fixed relation to the roller whereby both the roller and the tensioning means are moved in company as the bracket is moved.

6. A yarn furnishing device according to claim 1, having means to adjust the pressure between the roller and the disc.

7. A yarn furnishing device according to claim 1, having means to adjust the pressure between the roller and the disc which pressure adjusting means is supported from the bracket.

8. A yarn furnishing device according to claim 1, combined with means for tensioning the yarn before it enters between the disc and roller, and means to adjust the pressure between the disc and roller, and having means pivotally mounting said bracket for movement towards and away from one of the said gears, wherein the disc, roller, yarn-tensioning means and pressure adjusting means are all supported by the said bracket and are movable in company about the pivotal axis thereof.

9. A yarn furnishing device according to claim 1, combined with means to separate the furnishing disc and roller as the gears are disengaged.

10. A yarn furnishing device according to claim 1, combined with means to separate the furnishing disc and roller as the gears are disengaged, said means comprising a lever pivoted on the bracket and carrying the roller, and means operatively connecting the lever with another part of the device and so located that as the bracket is swung about its pivot the lever is moved to separate the roller from the disc.

11. A yarn furnishing device according to claim 1, combined with a lever pivoted on the bracket and carrying the roller, a rotatable camming member supported in the bracket, means operatively connecting the camming member with the said lever, and a rigid strut engaged between a fixed part of the device and the camming member on one side of its axis of rotation whereby as the bracket is swung the camming member will be turned to move the lever and carry the roller away from the disc.

12. A yarn furnishing device comprising the combination of a rotary furnishing disc, a spindle carrying said disc, a rotary furnishing roller for cooperating with a surface of the disc to furnish yarn, a spindle carrying said roller with the axis of the spindle disposed in a plane transverse to that containing the axis of the disc spindle, means to adjust the position of the roller lengthwise along its spindle thereby to adjust the roller towards or away from the center of the disc, said means comprising a lever having one end mounted on the spindle with the roller mounted thereon at a distance from the spindle, a pair of meshing gears for driving the disc one

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of said gears being mounted on the disc spindle, and a bracket which supports the disc spindle, which is pivotally mounted to swing about an axis transverse to that of the said disc spindle, and which also supports the roller spindle, whereby the gear carried by the bracket, the disc and the roller are movable in company as the bracket is turned about its axis.

13. A yarn furnishing device according to claim 12, combined with means for tensioning the yarn supported on the lever which carries the roller.

14. A yarn furnishing device according to claim 12, combined with a camming means rotatable about an axis substantially parallel with the axis of the roller spindle, means on the said bracket adapted to engage the camming means an arm extending laterally from said camming means, a rigid abutment engaged between the said arm and a fixed portion of the device and so located that as the bracket is swung about its axis the fixed abutment serves to turn the camming means and thereby to move the roller-carrying lever away from the disc.

15. A yarn furnishing device, comprising a rotary furnishing disc and a rotary furnishing roller cooperating with the face of the disc to grip the yarn, an adjustable tensioning device for applying tension to the yarn before it enters between the roller and disc, means for adjusting the roller towards and away from the

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center of the disc to vary the rate of yarn feed and for moving the tensioning device as the roller is thus moved, a pair of meshing gears for driving the disc, means for moving the gears out of mesh to interrupt the drive, a bracket pivoted for movement about an axis parallel with the axis of one of the two gears said one gear being a driving gear, a spindle in the bracket carrying the disc and the other gear said other gear being a driven gear, and means for rocking the bracket to bring the driven gear out of mesh with the driving gear.

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