

(No Model.)

N. L. RANDALL.

DRAWING ROLL.

No. 331,328.

Patented Dec. 1, 1885.

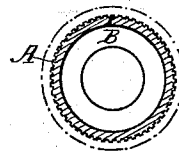
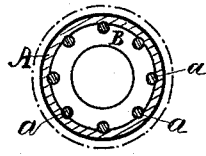
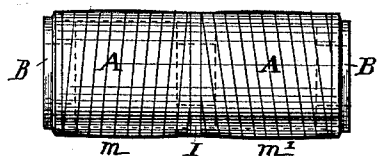
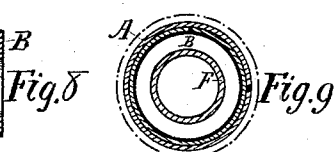
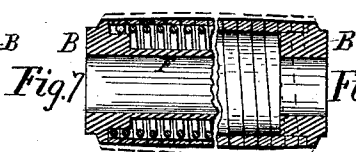
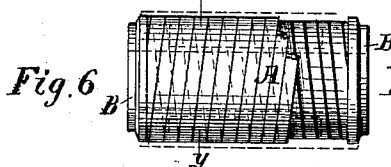
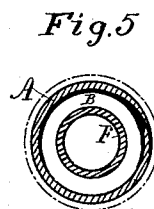
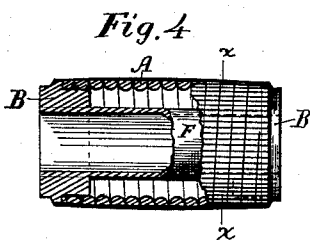
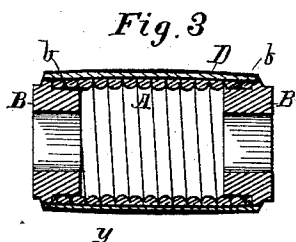
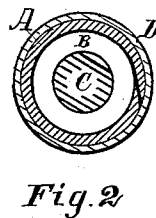
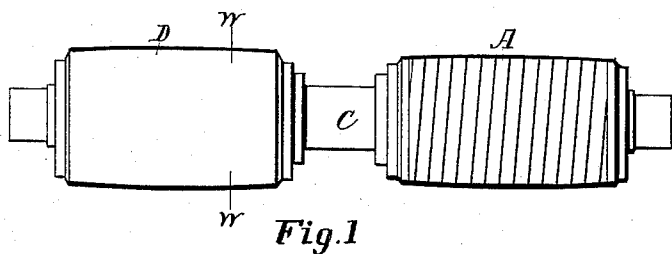


Fig. 10

Fig. 11

Fig. 12

Witnesses.

Inventor

J. Walter Smith.
E. H. Burleigh.

Fig. 13

Nelson L. Randall
By Chas. H. Burleigh
Atty-

UNITED STATES PATENT OFFICE.

NELSON L. RANDALL, OF GRAFTON, ASSIGNOR TO THE WRIGHT MACHINE COMPANY, OF WORCESTER, MASSACHUSETTS.

DRAWING-ROLL.

SPECIFICATION forming part of Letters Patent No. 331,328, dated December 1, 1885.

Application filed March 31, 1884. Serial No. 126,144. (No model.)

To all whom it may concern:

Be it known that I, NELSON L. RANDALL, a citizen of the United States, residing at Grafton, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Drawing-Rolls; and I declare the following to be a description of my said invention, sufficiently full, clear, and exact to enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My present invention relates to the construction of the drawing-rolls employed on spinning-machines, and on other classes of machines for working fibrous sliver, roving, or partially-finished threads or yarns; and the object of my invention is to provide a roll having a flexible or yielding body-cylinder for supporting the exterior covering or working-face in a manner that will give a strong grip upon the fibers of the roving and yield to inequalities in the material acted upon without exerting severe crushing action on the covering and the roving materials. This object I attain by a roll constructed substantially as herein illustrated and described, the particular subject-matter claimed being hereinafter definitely specified.

The nature of my invention consists in making the body or cylinder of the roll of wire in a helical coil or coils, supported at the ends by suitable disks or heads, and with intervening series of coils or rings that are free to bend, spring, or yield to external pressure singly or in groups, thus rendering the body of the roll flexible or elastic beneath its covering or surfacing, and independent of any elasticity due to the covering material.

Figure 1 is a view of a pair of drawing-rolls made in accordance with my invention, one of the rolls being shown with and the other without an exterior covering. Fig. 2 is a transverse section of the roll and arbor at line *ww* on Fig. 1. Fig. 3 is a longitudinal section of the roll. Fig. 4 is a part sectional and part side view of the roll without exterior covering, made with a tubular bushing through its center. Fig. 5 is a transverse section at line *xx* on Fig. 4. Fig. 6 is a side view of the roll

made with a double-coil cylinder, the outer coils being shown as broken away on a portion to reveal parts beneath. Fig. 7 is a longitudinal sectional view illustrating a modification of construction in which the cylinder is formed of a double coil of round and flat wire. Fig. 8 shows a modification in which the cylinder is formed of square wire. Fig. 9 is a transverse section at line *yy* on Fig. 6. Fig. 10 shows a modified form of the roll adapted for two lines of roving, or made with a central disk for supporting the coils. Fig. 11 is a transverse section of a modified construction in which the coils or rings are supported by longitudinal bars or springs within the roll. Fig. 12 is a transverse section showing the roll made with corrugated peripheral surface. Fig. 13 is a longitudinal section showing the roll made of triangular wire, and with heads fixed upon the arbor.

In referring to parts, A denotes the peripheral cylinder, barrel, or body of the roll, which is formed of coiled wire.

B denotes the heads or circular disks for supporting the ends of the coils at proper radial distance from the axial center.

C indicates the arbor or core upon which the roll is mounted, and D indicates the exterior covering, of leather or other suitable material, such as is commonly used for covering the surface of drawing-rolls.

The barrel or cylinder of the roll may be formed of one or more strands of wire wound in close helical order, so that the sides of the several rings or coils will touch each other, or nearly so, laterally; but said coils should not crowd against each other with sufficient force to interfere with the flexibility of the roll, or so as to prevent the free springing action of the individual rings or coils independently of each other when acted upon by external pressure.

The wire of which the flexible cylinder is formed may be of any suitable size and of any desired form of section—as round, half round, square, flat, triangular, or other suitable shape—and it may be wound or disposed either as a single helix or coil, as a double helix, or as an outer and inner coil one upon another, and with either right or left hand pitch of spiral, or both, as most convenient or

desirable for any particular class of work. The ends of the coiled barrel or cylinder A are supported by the heads B, the parts being attached together in any suitable manner. In the present instance the heads are provided with a shoulder or rabbet, *b*, that fits into the coil A. The ends of the coil are properly squared to match against the flange of the heads, and the parts are secured together by soldering, or in other suitable manner. The heads are properly centered and bored to fit the arbor C, upon which they serve as bearings for the revolving flexible shell; or, if preferred, a tubular bushing or quill, F, can be arranged through the heads for connecting one with the other and for giving the bearing upon the arbor. This latter form would be preferable in cases where a very flexible barrel or cylinder is used, in order to prevent lateral expansion and contraction of the roll. The outsides of the coils are dressed off flush with each other, thereby giving a continuous peripheral surface for sustaining the leather covering D, which surface may be made plain and smooth, or it may be roughened or longitudinally corrugated, as indicated in Figs. 4 and 12.

The barrel A is preferably made of slightly greater diameter at its central part than it is at its respective ends, so that its pressure when in use will be exerted at the position where it bears upon the strand of roving.

The wires or rods for forming the rings or coils in the body of the rolls may be of steel, iron, brass, or any suitable metal or material, and for this purpose I also contemplate using vulcanized rubber, celluloid, zylonite, or similar compositions in the form of wire, for constructing rolls for certain classes of work.

In the drawings I have shown several modifications in construction which come within the scope of my invention, and which modifications include the roll made with a central quill or support from one head to the other, (see Figs. 4, 5, 6, 7, and 9;) the roll made with a double coiled shell, one coil upon another and pitched in opposite directions, (see Figs. 6 and 9;) the roll made with an inner coil of round wire and an outer coil of flat wire, (see Fig. 7;) the roll made with a coil of square wire, (see Fig. 8;) the roll made with longitudinal rods or spring-bars *a*, extending from one head to the other within the circle for supporting the peripheral rings or coils, (see Fig. 11;) the roll made for operation on two lines of roving, as at *m m'*, and having a head or disk, I, at its center, thus giving two independently flexible or yielding portions, (see Fig. 10;) and the roll made with a coil of triangular wire, and with the heads fixed to the arbor. (See Fig. 13.)

The improved roll constructed as herein shown and described is rendered flexible and yielding in its barrel or cylindrical shell, so

that said cylinder or body will spring or give way inside of the external covering, D, thereby permitting the surface to conform to the strand of roving without exerting that degree of crushing action due to a rigid body-cylinder, and which tends to the wearing of grooves in the surface-covering, consequently the covering remains in good condition for a longer time, and a covering of thinner or less elastic material can be employed than has heretofore been practicable. The rolls can be operated with less weighting, as the surface fits down upon the roving and gives a surer grip upon the fibers, with a weight sufficient to spring inward one or two rings or coils in the body-cylinder.

I am aware that a drawing-roll has heretofore been described in a foreign patent, wherein a body of elastic material is externally wound with wire; but in such construction the roll is solid, the wire being supported from the interior, and elasticity being due to the material beneath the wire, whereas in my invention the wire or coiled rod forms a hollow cylindrical shell, and the coils alone give support and elasticity to the periphery of the roll.

What I claim as of my invention, and desire to secure by Letters Patent, is—

1. A drawing-roll for spinning or roving machines, the body of which consists of a hollow cylinder formed of coiled wire, substantially as hereinbefore set forth.

2. A drawing-roll consisting of a hollow peripheral shell or barrel formed of coiled wire supported by heads or end disks, said wire being laid in laterally-close unattached coils and externally dressed off to receive the face-covering, substantially as hereinbefore set forth.

3. A drawing roll formed as described, with a hollow cylindrical barrel made from wire in close elastic coils or rings, with its exterior surface dressed off and longitudinally corrugated or roughened for retaining the surface-covering, substantially as set forth.

4. The combination of a flexible roll, A, consisting of a hollow cylindrical shell formed of coiled wire, with supporting-heads B, and the central arbor, C, substantially as and for the purpose set forth.

5. The drawing-roll having a hollow cylindrical body formed of yielding coils of wire arranged in the manner described, with the central part of said body of slightly greater diameter than the ends, substantially as and for the purposes set forth.

Witness my hand this 12th day of March, A. D. 1884.

NELSON L. RANDALL.

Witnesses:

CHAS. H. BURLEIGH,
J. WALTER SMITH.