No. 739,983. PATENTED SEPT. 29, 1903.

M. CAMPBELL.

SPINNING MACHINE.

APPLICATION FILED MAY 16, 1901.

NO MODEL.

FIG. 3.

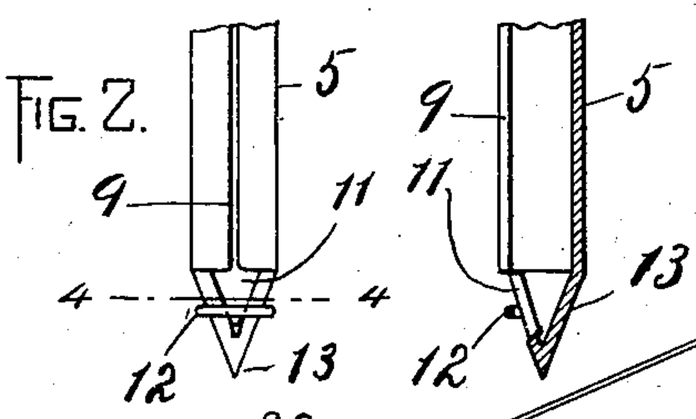

FIG. 4.

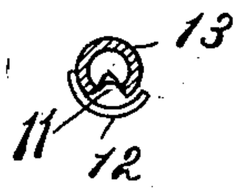

FIG. 1.

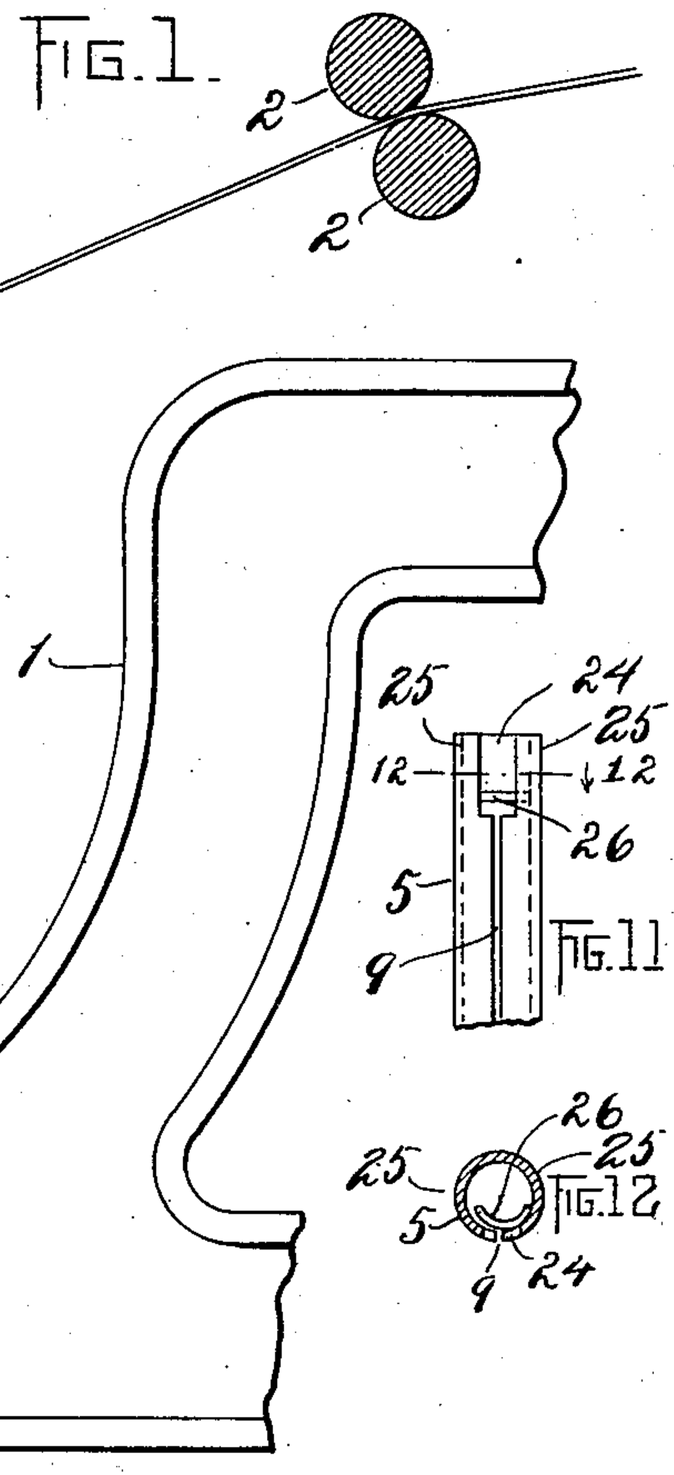

FIG. 2.

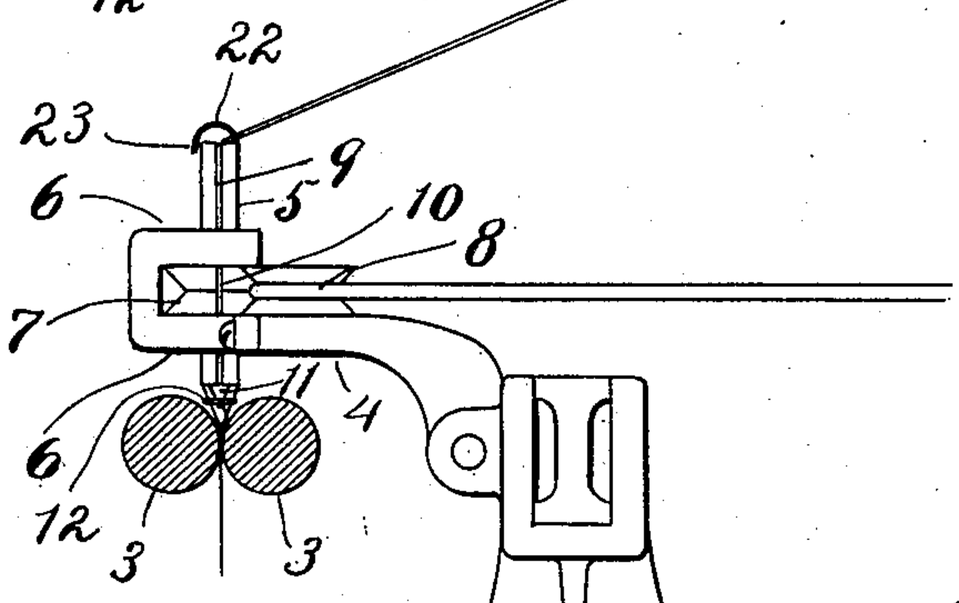

FIG. 11.

FIG. 12.

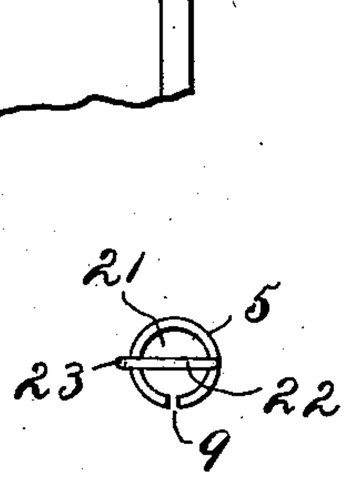

FIG. 5.

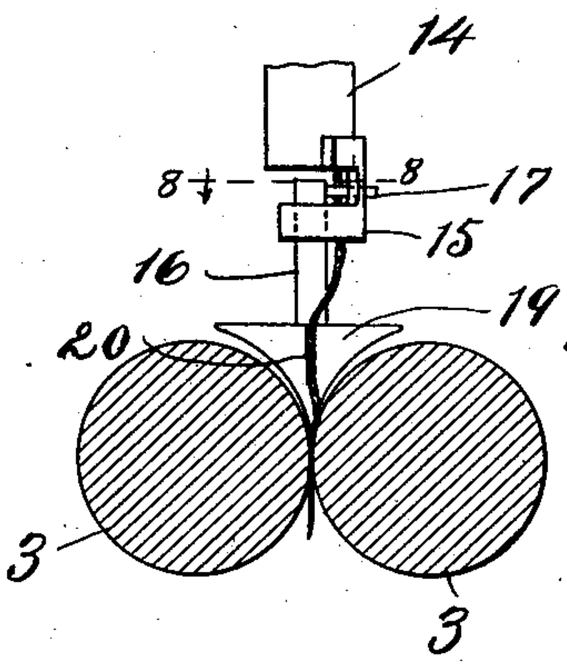

FIG. 6.

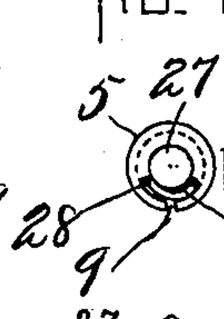

FIG. 14.

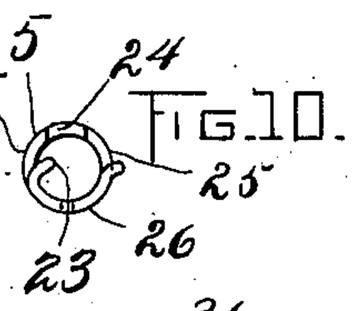

FIG. 10.

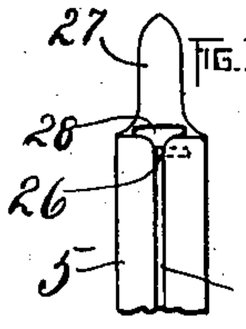

FIG. 13.

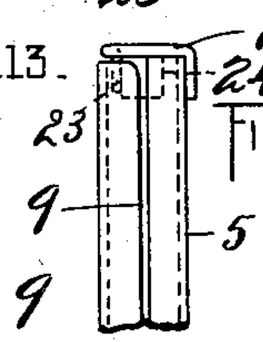

FIG. 9.

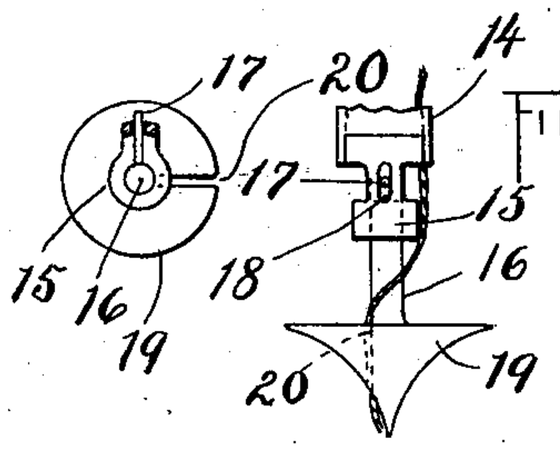

FIG. 8.

FIG. 7.

WITNESSES:
E. Batchelder
George Rogers.

INVENTOR:
Malcolm Campbell
by Wright Brown Quinby & Atty.

No. 739,983. Patented September 29, 1903.

UNITED STATES PATENT OFFICE.

MALCOLM CAMPBELL, OF BOSTON, MASSACHUSETTS.

SPINNING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 739,983, dated September 29, 1903.

Application filed May 16, 1901. Serial No. 60,435. (No model.)

To all whom it may concern:

Be it known that I, MALCOLM CAMPBELL, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Spinning-Machines, of which the following is a specification.

This invention relates to spinning and twisting machines, and particularly to those for spinning and twisting wool.

The objects of the invention are to simplify the twister, to enable it to twist closer to the nip of the drawing-rolls, and to make the twisting end of the twister automatically adjustable with respect to said rolls.

With these ends in view the invention consists in the novel features of construction and arrangement, which I shall now proceed to describe and claim.

Of the accompanying drawings, Figure 1 represents a section with parts in side elevation of a spinning-frame provided with my improvements. Fig. 2 represents an enlarged front elevation of the lower end of the twister. Fig. 3 represents a vertical section thereof. Fig. 4 represents a section on the line 4 4 of Fig. 2. Fig. 5 represents a top plan view. Fig. 6 represents a section showing a modification. Fig. 7 represents a rear elevation of the twister shown in said figure. Fig. 8 represents a section on the line 8 8 of Fig. 6. Fig. 9 represents an elevation of the upper end of another modified twister-head. Fig. 10 represents a top plan view thereof. Figs. 11 and 12 represent, respectively, a front elevation and plan of another modification of the upper end. Figs. 13 and 14 represent similar views of still another modification.

The same reference characters indicate the same parts in all the figures.

In the drawings, 1 represents a spinning-frame having top or delivery rolls 2 2, lower or drawing rolls 3 3, and a rail 4, supporting the twister-heads. The novel twister-heads herein shown comprise a tubular twister stem or body 5, mounted to rotate in bearings 6 and having a whirl or pulley 7, engaged on the rear side by a driving-belt 8. The tubular stem 5 is formed from end to end with a longitudinal slot 9 in its wall, and the whirl 7 at 10 and also the bearings 6 are slotted in order to permit the yarn to be laterally threaded into the twister-head instead of being passed axially through the tubular stem 5. At the lower end of the slot 9 is an enlarged aperture 11, bridged by a guard-finger or hook 12, having a free end whereby the yarn is retained when first engaged with the twister during the threading operation. The construction thus far described is claimed in a separate application, Serial No. 43,008, filed by me January 12, 1901.

The lower or twisting end of the twister-head is made conical at 13 to enable it to be inserted into the contracted space between the drawing-rolls 3 3, close to the nip of the latter. The lower end of the aperture 11 constitutes a yarn-guide eccentric to the axis of rotation of twister-stem 5 and adjacent to the extremity of the conical end 13. This yarn-guide and the portion of the conical end 13 below it exert a frictional gripping action upon the yarn, which twists it by the rotation of the twister-head and starts the twist from the point of the conical end 13 close to the nip of the drawing-rolls.

In order to avoid the necessity of making delicate adjustments between the drawing-rolls and the conical end of a twister-head such as that above described, I have devised a modification (shown in Figs. 6, 7, and 8) in which the twister-head comprises a tubular upper body or stem 14 similar to the upper portion of the tubular stem 5 and stationarily mounted with respect to the drawing-rolls 3 3. Fixed to the end of the body 14 is an apertured guide 15, in which a stem 16 is mounted to rise and fall freely, but is prevented from rotating with respect to the body 14 by means of a pin 17 on said stem occupying a longitudinally-elongated slot 18 in the shank of the guide 15. The stem 16 carries at its lower end a conical twister end 19, which rotates with the twister-body 14 and is supported by the drawing-rolls 3 3, being also concaved to conform to the periphery of said rolls. The twister end 19 is provided with a

laterally-exposed longitudinal groove 20, extending to the vicinity of the stem 16 and having its lower end adjacent to the point of the twister end 19 and eccentric to its axis of rotation. This groove 20 constitutes a yarn-guide, having the same action on the yarn as the guide 11, hereinbefore described. This form of movable twister end automatically compensates for any minute changes in distance between the twister-head rail 4 and the drawing-rolls 3 and avoids the necessity for careful adjustment of the twister ends with respect to the drawing-rolls when the machine is assembled.

Part of the function of the twister-head is to give the yarn a series of intermittent pulls or jerks. For this purpose the upper end of the tubular twister-body 5 is provided with an eccentric yarn puller or jerker, of which four forms are shown in the drawings. In Figs. 1 and 5 a vertically-arched wire finger 22 is secured at one end to the upper edge of the body 5 and is provided with a free end 23 adjacent to the edge on the opposite side of the tube-orifice. On one side of this finger is the slot 9, and on the opposite side the space between the finger and the semicircular edge of the tube constitutes an aperture for receiving the yarn during the operation of the twister. The space between the free end 23 of the finger and the wall of the tube constitutes a permanently open passage leading laterally into this aperture, through which the yarn is threaded after being passed through the slot 9, said passage being arranged to prevent the escape of the yarn from said aperture when the twister is running. Each half of the finger 22, from the twister-axis outwardly, constitutes a yarn jerker or shoulder, so that the twister will operate properly in either right-hand or left-hand running. The twister-axis is set at a wide angle to the line between the delivery and drawing rolls, as seen in Fig. 1, so that as it rotates the yarn engages and winds partly around and then slips off of the finger 22 and is thereby intermittently jerked or pulled out.

In the form shown in Figs. 9 and 10 a notch 24 is provided in the upper edge of the tube-wall opposite the slot 9, in which the yarn permanently resides during the twisting. In this case the cheeks 25 25 of the tubular body constitute eccentric yarn-jerkers for running in either direction, the yarn winding part way around the tube over either cheek, according to the direction, and then slipping off. To prevent the yarn from becoming caught in the slot 9 as it winds around the tube, I provide a guard-finger 26, bridging said slot and concentric with the upper edge of the tube, said finger having a free end 23, between which and the tube-wall is a permanently open threading-passage, by way of which the yarn may be passed from the slot 9 into the yarn-receiving aperture, which in this case constitutes the whole of the tube-orifice.

In Figs. 11 and 12 the notch 24 is located immediately above the slot 9 and the guard-finger 26 occupies a position in relation to said slot similar to that which it occupies in Figs. 9 and 10.

Figs. 13 and 14 illustrate a modification in which the tubular body is surmounted by an axial projection 27, the surface of which constitutes an eccentric yarn-jerker for running in either direction. The slot 9 is guarded by a finger 26, and above this finger is a yarn-receiving aperture 28.

Various other modifications may be made without departing from the spirit of my invention.

I claim—

1. A twister-head for spinning-machines comprising a stem or body having a conical twisting end, provisions for the lateral insertion of the yarn into the said stem or body, and an eccentric yarn-guide adjacent to the extremity of said end.

2. A spinning-machine having drawing-rolls in combination with a twister-head comprising a stem or body having a conical pointed twisting end entering the converging space between said rolls above the nip, and an eccentric yarn-guide adjacent to the extremity of said end.

3. A spinning-machine having drawing-rolls in combination with a twister-head comprising a body stationarily journaled with respect to the rolls, and a twisting end supported by the rolls and axially movable with respect to said body.

4. A spinning-machine having drawing-rolls in combination with a twister-head comprising a body stationarily journaled with respect to the rolls, and a conical twisting end supported by the rolls and axially movable with respect to the body, said end having an eccentric yarn-guide adjacent to its extremity.

5. A spinning-machine having drawing-rolls in combination with a twister-head comprising a body stationarily journaled with respect to the rolls, and a conical twisting end supported by the rolls and axially movable with respect to the body, said end being concave to conform to the surface of the rolls and having an eccentric yarn-guide adjacent to its extremity.

6. A spinning-machine having drawing-rolls in combination with a twister-head comprising a body stationarily journaled with respect to the rolls, a twisting end supported by the rolls and axially movable with respect to the body, and means to prevent the rotation of said end relatively to the body.

7. A twister-head for spinning-machines comprising a body, and a twisting end freely movable axially with respect thereto.

8. A rotary twister having an eccentric yarn-jerker, a yarn-receiving aperture adjacent thereto, and a permanently open threading-passage leading laterally into said aperture and arranged to prevent the escape of the yarn.

9. A rotary tubular twister having an eccentric yarn-jerker at one end, a yarn-receiving aperture adjacent thereto, a slot for threading the yarn laterally into the twister-head, and a guard-finger arranged to prevent the entrance of the yarn into said slot and having a free end.

In testimony whereof I have affixed my signature in presence of two witnesses.

MALCOLM CAMPBELL.

Witnesses:
R. M. PIERSON,
H. L. ROBBINS.