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SPINNING MACHINE

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FIG. 1.

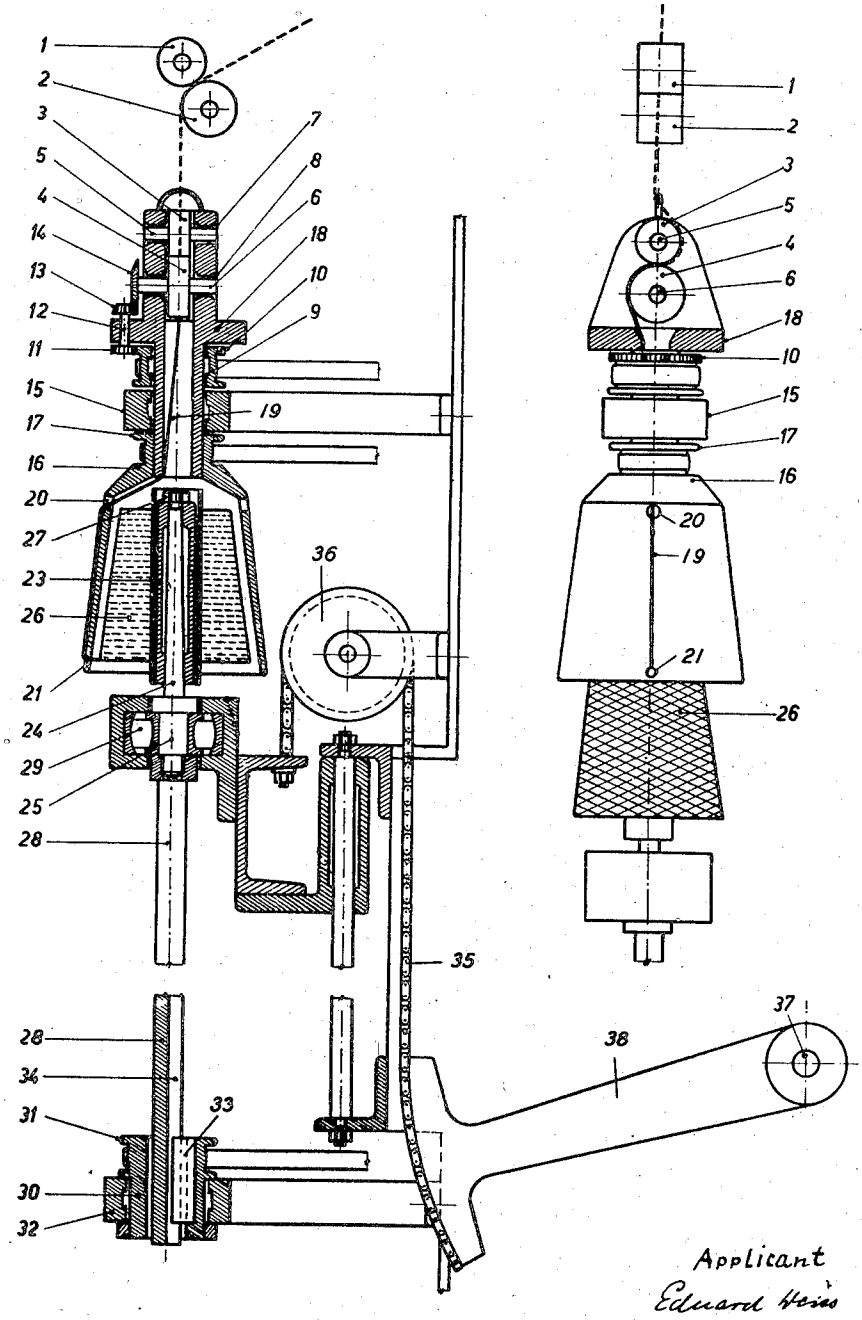


FIG. 2.

Applicant
Edward Weiss
By E. J. Freeman
Atty.

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SPINNING MACHINE

Eduard Weiss, Brunn, Czechoslovakia

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5 Claims. (Cl. 57—74)

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This invention relates to a continuously operating machine for spinning fibrous raw materials. According to the invention the twisting and winding of the thread take place simultaneously, but on different arrangements.

The twisting is effected by means of a pair of rolls, which conveys at the same speed as the drawing or feed rolls and at the same time rotates about the longitudinal axis of the roving between this pair of rolls and the drawing or feed rolls. During the twisting the thread always maintains its vertical position. The effect of this procedure is, that the roving has the twist imparted to it without any additional tensile stressing. As the twisting takes place without tension, it is possible to work at the maximum technically attainable speed of revolution. This signifies a very great output increase in the delivery of yarn per spinning element and the possibility of producing yarns of all kinds and thicknesses, whilst in addition the main causes of thread breakages are eliminated.

By arranging two such pairs of rolls, which convey at different speeds, it is possible, if this be desired, to effect a drawing of the thread, whilst the twisting is done without tension.

The finished yarn is wound on a sleeve which rests loosely on a flexibly journalled spindle. On this sleeve the tube for the yarn winding is placed firmly. The sleeve with tube and yarn winding is carried round by the rotating spindle by means of friction which is adjustable by a screw nut and, in addition, the spindle performs an upward and downward motion equal to the height of the yarn winding. The speed of revolution of the spindle is smaller than the speed of revolution of the twisting device, in order to produce the winding of the yarn. This effects a constant lag of the yarn winding with the sleeve relative to the spindle and this lag will be the greater, the large the diameter of the yarn winding becomes in the course of the spinning process. At the same time the thread tension remains unchanged in spite of the increase of the diameter of the yarn winding.

In Figs. 1 and 2 of the accompanying drawing a constructional example of the invention is illustrated, Fig. 1 showing the upper and Fig. 2 the lower operative position for spinning.

The pair of rolls 1, 2 are the drawing or feed rolls which feed the roving to the pair of rolls 3, 4. The latter rotate on the one hand about their axes 5, 6 and on the other hand about the longitudinal axis of that portion of the roving,

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which lies between the pair of rolls 1, 2 and the pair of rolls 3, 4.

The rotation about the longitudinal axis is produced through the shafts 5, 6 not only rotating about their own axes, but also turning with their bearings 7, 8 in horizontal planes. The rotary motion about its axis 6 is imparted to the lower roll 4 through a whorl 9, driven for instance by a band, said whorl being made integral with a toothed wheel 10 which meshes with a toothed wheel 11, on the shaft 12 of which is mounted a bevel wheel 13 which meshes with the bevel wheel 14, whereby the roll 4 has a rotary motion about its axis 6 imparted to it. The roll 3 is carried round by friction.

The rotary motion of the pair of rolls 3, 4 about the axis of the roving is given to it by the provision below the bearing 15 of the bell 16 which is driven by a driving whorl 17. The bell 16 is firmly connected to the bearing body 18 of the pair of rolls 3, 4, so that the axes 5, 6 and consequently the rolls 3, 4 as well turn in horizontal planes, that is about the axis of the roving, so that the twisting of the spun yarn takes place.

The twisted thread 19 is passed through the hole 20 out of the bell 16 and re-enters the interior of the bell through the hole 21, where it is then attached to the tube 22. The tube 22 is pushed on to the sleeve 23 with a tight fit. The sleeve 23 is placed loosely on the conical upper part 24 of a spindle 25 and is carried round by friction along with the tube 22 and the yarn winding 26. The amount of friction is adjustable by means of the nut 27. The spindle 25 is made in two parts, the conical upper part 24 being screwed firmly to the lower part 28.

The spindle is journalled in a flexible manner, being supported on the one hand in the barrel-shaped roller bearing 29 and on the other hand with a suitable amount of play by a sleeve 30 which is made in one piece with a driving whorl 31 and is supported in a fixed bearing 32. In this sleeve 30 a key 33 is inserted, which engages with suitable clearance in a groove 34 of the spindle part 28, so that the spindle takes part in the rotary motion of the driven sleeve 30. The bearing 29 and thereby the spindle 25 with the yarn winding 26 can be moved upwards and downwards in the groove 34, by being suspended from a chain 35 which is taken over pulley 36 and is lowered and raised alternately by the height of the yarn winding by means of a rocking lever pivoted at 37.

I claim:

1. In a continuously operated spinning appa-

ratus a pair of vertically superposed horizontal twisting rolls to receive a roving therebetween said roving passing to and from said rolls in a substantially vertical direction, means to rotate said rolls about their horizontal axes and simultaneously about the vertical feeding direction of the roving, a yarn-winding device located underneath said pair of rollers said device including a sleeve-supported tube to receive the yarn and a spindle carrying said tube, a bell downwardly extending from said lower twisting roll and rotatable therewith about said vertical feeding direction and encasing said yarn winding device to conduct the yarn from the twisting rolls onto said tube and means to rotate said spindle independently of the rotation of said bell.

2. In a continuously operated spinning apparatus according to claim 1 means to operatively couple the yarn-winding carrying tube and the spindle by adjustable friction means.

3. In a continuously operated spinning apparatus according to claim 1 means to vertically displace the yarn winding device and to thereby lower the wound-up yarn body from the encasing bell, said means including a chain connected with the spindle.

4. In a continuously operated spinning apparatus according to claim 1 means to flexibly support the spindle of the yarn winding device, said spindle consisting of an upper conical portion and a lower cylindrical portion and a barrel shaped roller bearing to connect said portions.

5. In a continuously operated spinning apparatus according to claim 1 the bell conveying the yarn from the twisting rollers to the winding device being provided with an upper exit opening and a lower entrance opening.

EDUARD WEISS.

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