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O. EDELMANN
SPINNING MACHINE
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Fig. 1.

Fig. 3.



Fig. 4.

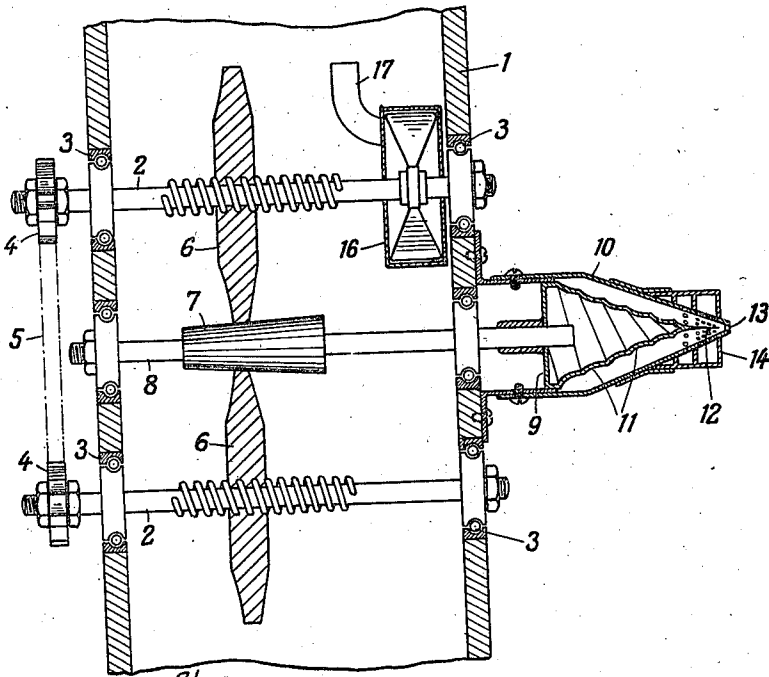
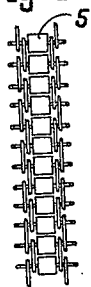
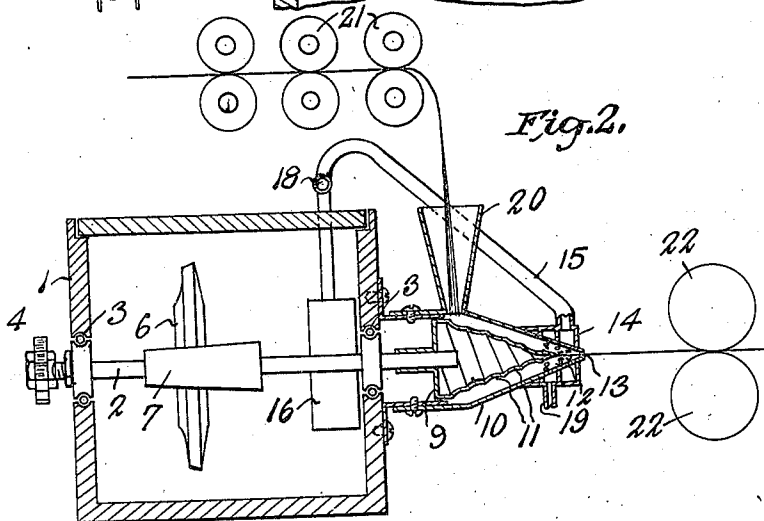


Fig. 2.



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SPINNING MACHINE.

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This invention relates to a spinning machine in which the fibres are sucked, by a funnel, into a hollow conical body which has spiral-shaped grooves and which terminates in a point leading to the mouth of the funnel. The hollow conical body is rotated by a friction wheel gear consisting of a cone mounted on the axle of the hollow conical body and of driving disks mounted on two driving shafts in the shape of screw spindles and exerting a positive action upon the cone by the centrifugal power transmitted to them.

An embodiment of the invention is shown, by way of example, in the accompanying drawing in which—

Fig. 1 is a longitudinal section and

Fig. 2 is a cross section.

Fig. 3 shows in side elevation and

Fig. 4 in plan view the link chain which connects the driving spindle.

Two driving shafts 2 are journaled in ball bearings 3 in a casing 1. On the end of each shaft a sprocket wheel 4 is mounted, said sprocket wheels being connected the one with the other by a link-chain 5. One of the spindles 2 is coupled with a high-speed electro-motor not shown. Both spindles 2 might be coupled with the electro-motor.

In order to obtain the highest possible revolving speed of the spindles 2 the transmission between the driving disks of the motor and the toothed wheels 4 is selected as 1 by 5 or more. The shafts 2 are screw spindles and a disk 6 is mounted on each shaft 2. Between said shafts 2 a shaft 8 is journaled in ball bearings 3 in the casing 1 and on the front end of shaft 8 a hollow conical body 9 is mounted which is enclosed by a funnel 10. This conical body 9 has spiral shaped windings 11 terminating in a point 12 extending to the mouth 13 of the funnel. A chamber 14 around the funnel communicates with the inner space of said funnel 10 as its wall consists of wire gauze. The chamber 14 is connected by a flexible tube 15 to an exhauster 16 mounted on one of the shafts 2 and having an exhaust tube 17. In the connecting tube 15 a regulating valve 18 is arranged. Nozzles open into the funnel 10, said nozzles being connected by a pipe 19 to a pipe for compressed air or steam, not shown. The funnel 10 has further an intake funnel 20 above which the stretching rollers 21 are arranged. Deliver-

ing rollers 22 are arranged in front of the funnel mouth 13.

The operation is as follows:—

As the pulleys 6 are loosely mounted on the shafts 2, which consists of screw spindles, they are pressed by the centrifugal action onto the cone 7 so that the shaft 8 and with it the conical hollow body 9 are rapidly rotated. By the exhauster 16 on one of the shafts 2 the air is sucked off from the funnel 10 and the air current flowing through the intake funnel 20 into the vacuum produced sucks the fibres, in which come from the stretching rollers 21, and blows the same against the hollow conical body 9. As this hollow conical body rotates very rapidly the fibres are drawn along the same towards the point 12 and spun by the spiral shaped windings 11 of the body 9. The spun fibres are blown out from point 12 through the mouth 13 of the funnel and gripped by the delivering rollers 22. The gyrating fibres are strongly blown onto the conical body 9 and into the spiral shaped windings 11 of the same by the action of the compressed air or of the impregnated steam from tube 19. The stretching rollers must be adjustable in order to be able to regulate the quantity of fibres which pass through between the same whereby the quality of the threads is determined.

As the commonly used cord drive or belt drive does seldom stand the very high speed which is necessary and as the cord or belt slips upon the pulley, wherefrom suffers the quality of the spun material, the shafts 2 are driven by chain. The positive driving by means of the friction wheels improves with the increase of speed. The spinning spindle 1 must execute about 37,000 revolutions per minute, this speed being still further increased by selecting a higher ratio of transmission.

As the exhauster is mounted on a driving shaft 2 every spindle may have its own exhauster, whereby expensive plants for the sucking in of the fibres which gyrate through the eddies are avoided. As the air eddy is produced in the funnel from one end of the same to the other end and all over the spinning cone 9 the fibres are uniformly pulled forward towards the point 12 along the spiral shaped windings 11 and twisted to form a thread.

Owing to the fact that by the link chain

and by the friction disks 6 about 37,000 revolutions or more of the spinning spindle are obtained the efficiency of the machine is much greater than that of the commonly used spinning banks. The spinning of thin threads is much cheaper with the aid of the air eddy than it is at present. The length of the spinning cone is selected according to requirement and if the funnel is adjustable in axial direction the space between spinning cone and funnel wall can be made narrower or wider at will. If the spinning operation is started a thin wire is inserted into the mouth of the funnel on which collect the fibres whereupon the thread is pulled by hand out of the mouth of the funnel and inserted between the delivering rollers 22.

The compressed air or the impregnated steam is preferably supplied to all the spindles from a central station. The steam is preferably impregnated by a solution of 0, 1 to 1% of a very effective mucilage which dilutes in the steam and has a favorable action upon the textile fibres.

I claim:—

1. A spinning machine, comprising in combination a hollow conical spinning body having spiral windings, a funnel open at the front and enclosing said spinning body, a spindle on which said spinning body is mounted, a cone on said spindle, two driving shafts in the shape of screw spindles one at the right and the other at the left of said spindle, a friction wheel loosely mounted on each driving shaft and designed to rotate said cone on said spindle by friction at a very high speed, and means for producing an air eddy in said funnel to suck the fibres into said funnel and to blow them against said spinning cone on which the fibres are twined to form a thread which is delivered through the open point of said funnel.

2. A spinning machine, comprising in combination a hollow conical spinning body having spiral windings, a funnel open at the front and enclosing said spinning body, a spindle on which said spinning body is mounted, a cone on said spindle, two driving shafts in the shape of screw spindles one at the right and the other at the left of said spindle, a friction wheel loosely mounted on each driving shaft and designed to rotate

said cone on said spindle by friction at a very high speed, and an exhaustor on one of said driving shafts for producing an air eddy in said funnel to suck the fibres into said funnel and to blow them against said spinning cone on which the fibres are twined to form a thread which is delivered through the open point of said funnel.

3. A spinning machine, comprising in combination a hollow conical spinning body having spiral windings, a funnel open at the front and enclosing said spinning body, a spindle on which said spinning body is mounted, a cone on said spindle, two driving shafts in the shape of screw spindles one at the right and the other at the left of said spindle, a friction wheel loosely mounted on each driving shaft and designed to rotate said cone on said spindle by friction at a very high speed, an exhaustor on one of said driving shafts for producing an air eddy in said funnel to suck the fibres into said funnel and to blow them against said spinning cone on which the fibres are twined to form a thread which is delivered through the open point of said funnel, and means for forcing compressed air from the outside into said funnel and onto said spinning cone to blow the fibres concentrically onto said spinning cone.

4. A spinning machine, comprising in combination a hollow conical spinning body having spiral windings, a funnel open at the front and enclosing said spinning body, means for adjusting said funnel in axial direction, a spindle on which said spinning body is mounted, a cone on said spindle, two driving shafts in the shape of screw spindles one at the right and the other at the left of said spindle, a friction wheel loosely mounted on each driving shaft and designed to rotate said cone on said spindle by friction at a very high speed, and means for producing an air eddy in said funnel to suck the fibres into said funnel and to blow them against said spinning cone on which the fibres are twined to form a thread which is delivered through the open point of said funnel.

In testimony whereof I affix my signature.

OSKAR EDELMANN.