(No Model.)

4 Sheets—Sheet 1.

N. CUPERS.

APPARATUS FOR SPINNING FIBROUS MATERIALS.

No. 511,878. Patented Jan. 2, 1894.

Fig. 2.

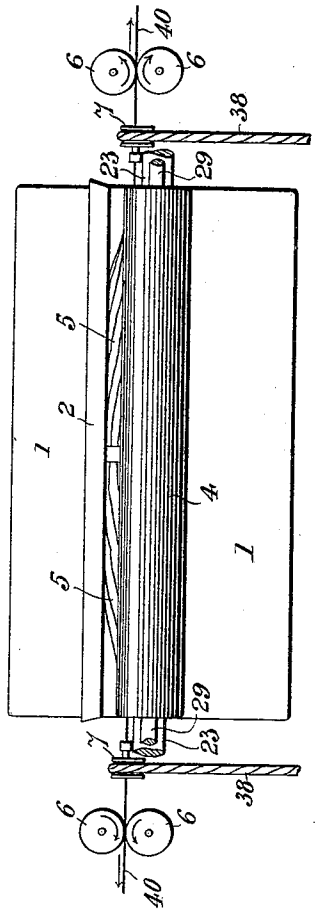


Fig. 3.

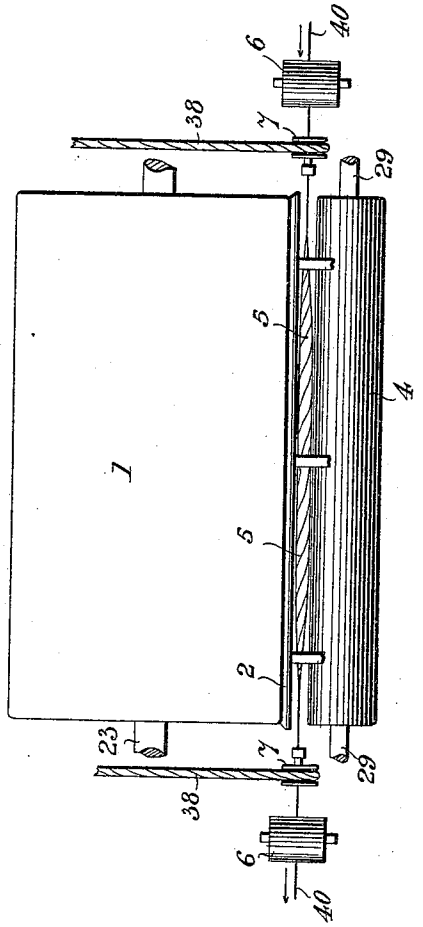
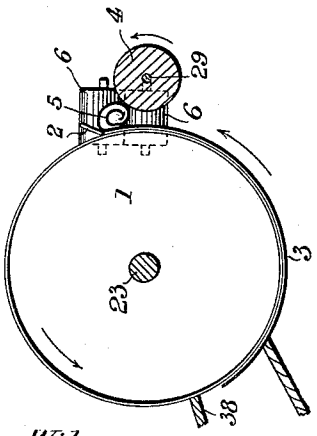


Fig. 1.



Witnesses.
A. N. Dobson
L. P. Kramer.

Inventor:
Nicolas Cupers
by Foster Freeman
Attorneys

THE NATIONAL LITHOGRAPHING COMPANY,
WASHINGTON, D. C.

(No Model.)

4 Sheets—Sheet 2.

N. CUPERS.

APPARATUS FOR SPINNING FIBROUS MATERIALS.

No. 511,878. Patented Jan. 2, 1894.

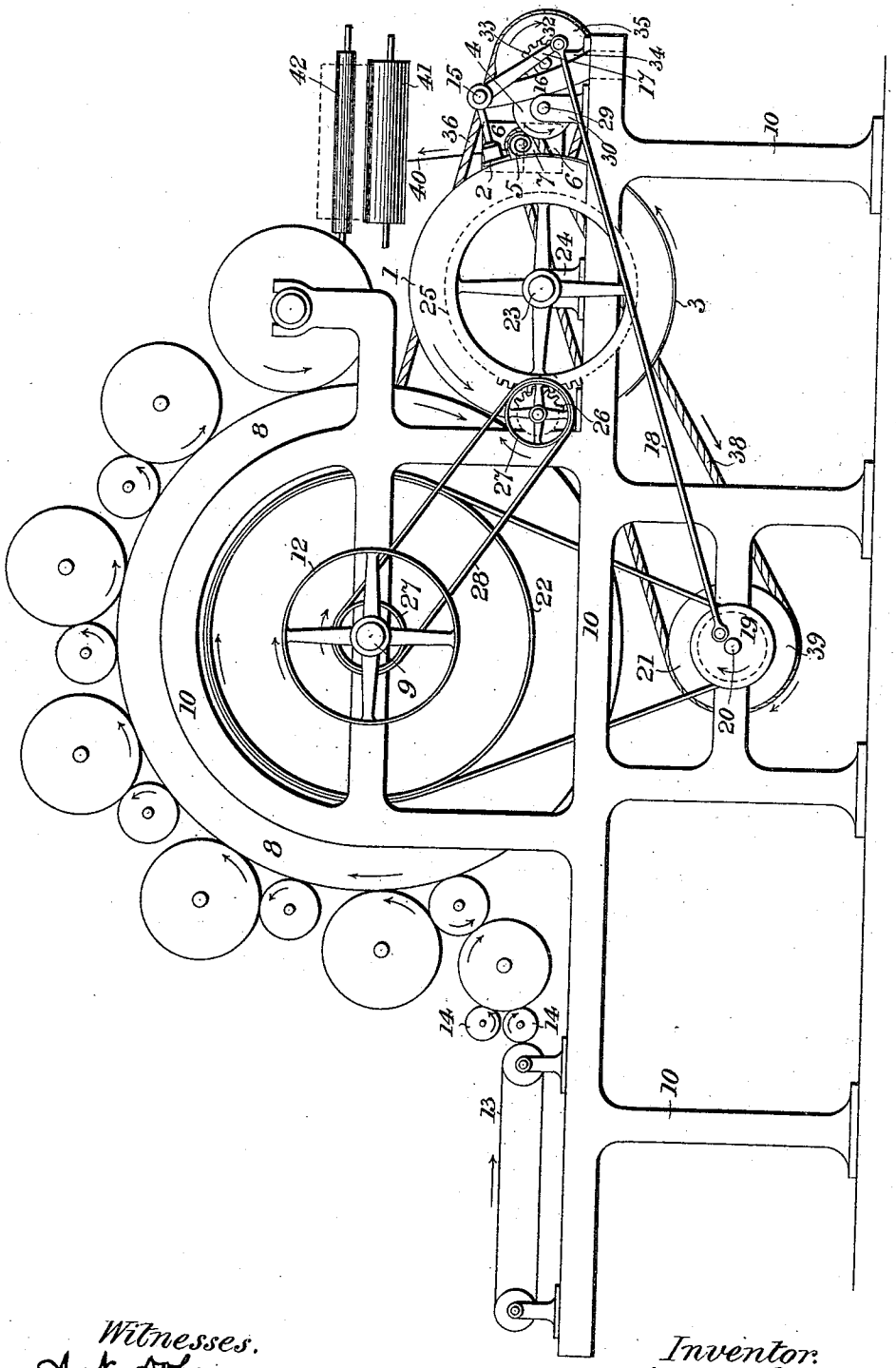


Fig. 4.

Witnesses.
A. N. Dobson
G. P. Kramer.

Inventor:
Nicolas Cupers
By Foster Freeman
Attorneys.

THE NATIONAL LITHOGRAPHING COMPANY.
WASHINGTON, D. C.

(No Model.) 4 Sheets—Sheet 3.

N. CUPERS.

APPARATUS FOR SPINNING FIBROUS MATERIALS.

No. 511,878. Patented Jan. 2, 1894.

Fig. 5.

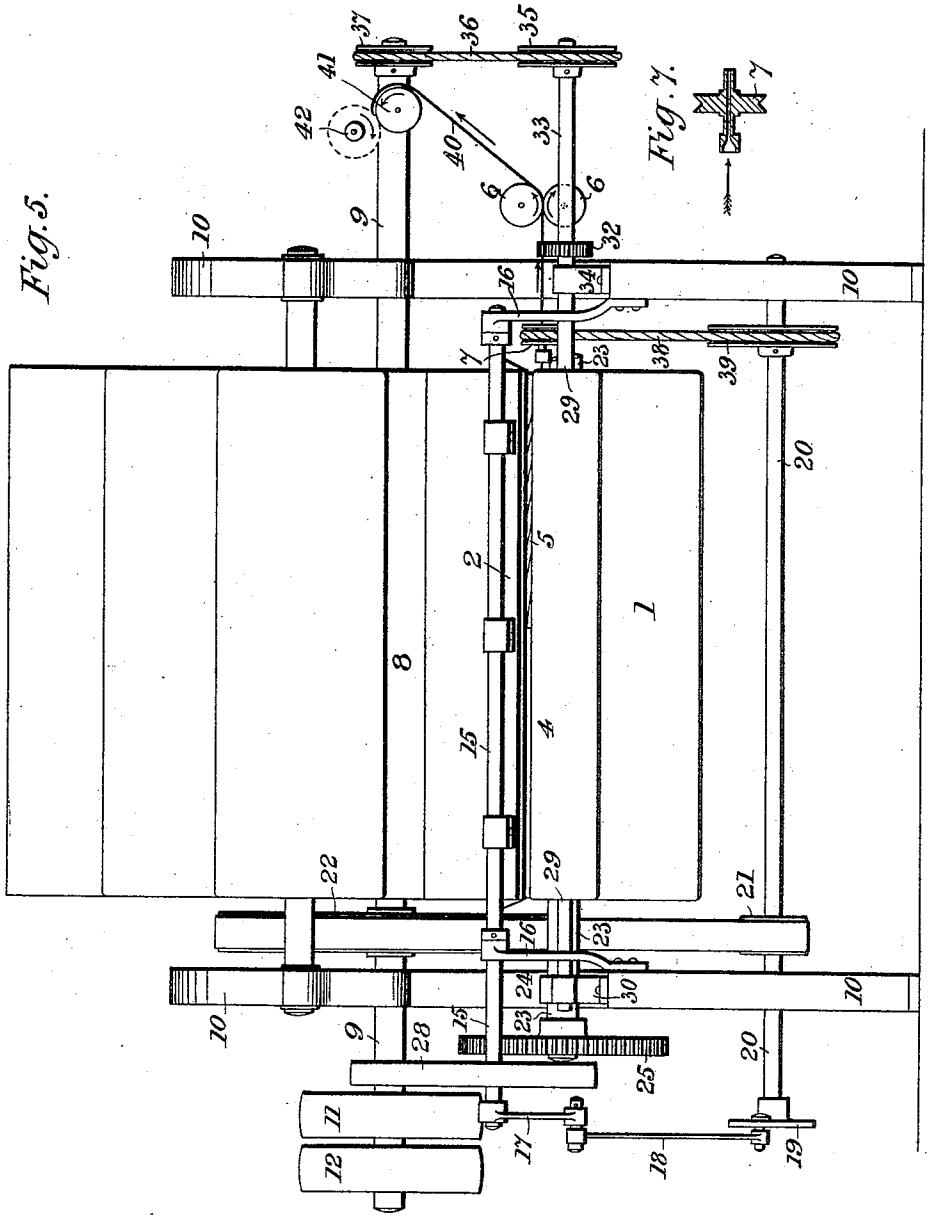


Fig. 7.

Witnesses.
A. N. Dobson
G. P. Kramer.

Inventor.
Nicolas Cupers
By Foster Freeman
Attorneys

THE NATIONAL LITHOGRAPHING COMPANY,
WASHINGTON, D. C.

(No Model.)

4 Sheets—Sheet 4.

N. CUPERS.

APPARATUS FOR SPINNING FIBROUS MATERIALS.

No. 511,878. Patented Jan. 2, 1894.

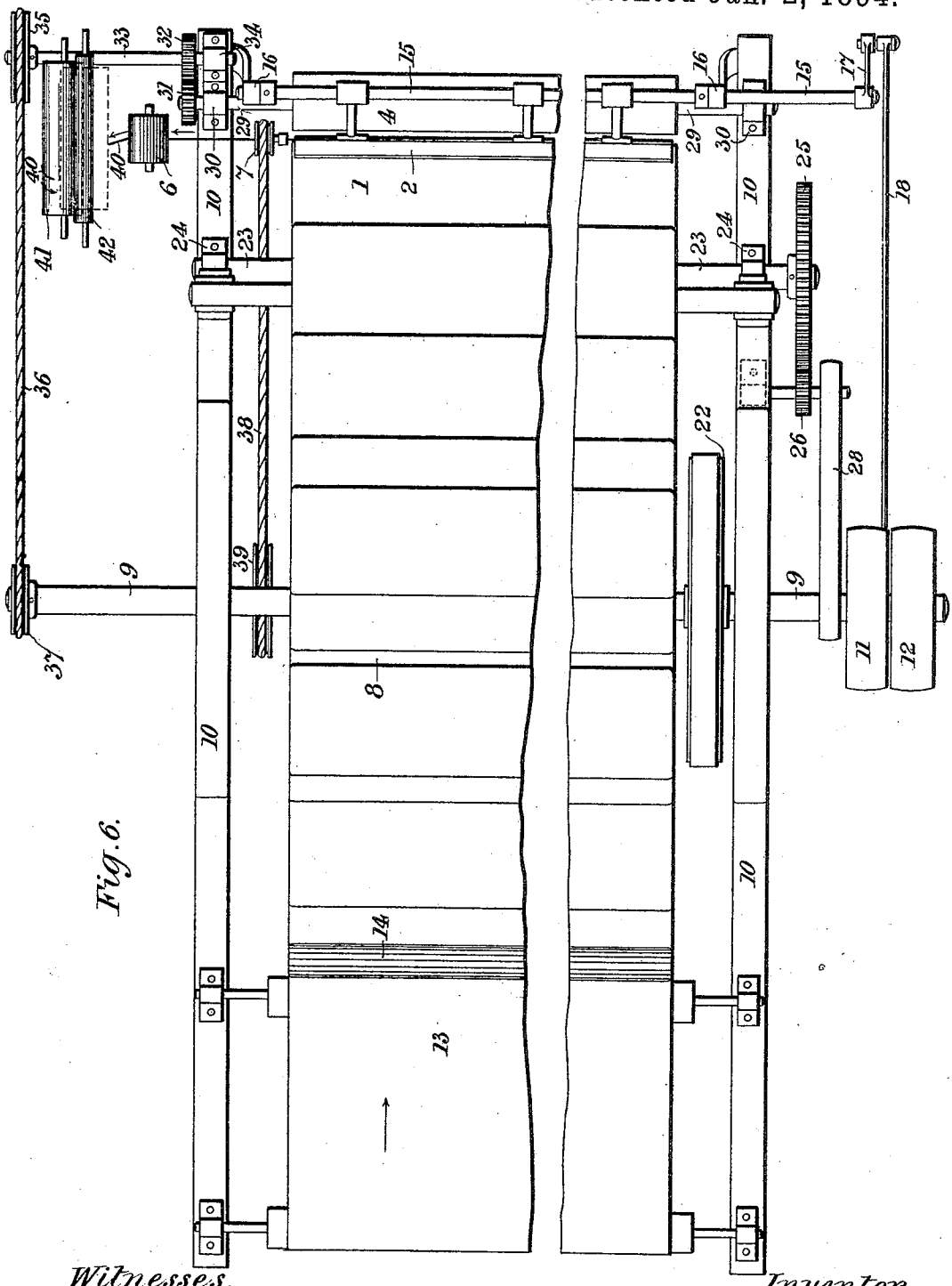


Fig. 6.

Witnesses.
A. N. Dobson
G. P. Kramer.

Inventor:
Nicolas Cupers
By Foster Freeman
Attorneys

THE NATIONAL LITHOGRAPHING COMPANY,
WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

NICOLAS CUPERS, OF WEERT, NETHERLANDS.

APPARATUS FOR SPINNING FIBROUS MATERIALS.

SPECIFICATION forming part of Letters Patent No. 511,878, dated January 2, 1894.

Application filed March 16, 1893. Serial No. 466,335. (No model.) Patented in Belgium April 15, 1892, No. 99,060, and in France April 19, 1892, No. 221,010.

To all whom it may concern:

Be it known that I, NICOLAS CUPERS, a subject of the King of Belgium, residing at Weert, in the Province of Limbourg, Netherlands, have invented a certain new and useful Apparatus for Spinning Fibrous Materials, (for which I have obtained Letters Patent in Belgium, No. 99,060, dated April 15, 1892, and in France, No. 221,010, dated April 19, 1892,) of which the following is a specification.

This invention relates to apparatus for the spinning of fibrous materials and by its aid materials having but a short fiber, such as peat, cow-hair, cotton waste and the like or a mixture of these or like substances may be spun directly from a mass into threads or cords of a predetermined size.

The invention may be carried out with an ordinary carding machine in conjunction with the additions and improvements, the nature of which is hereinafter set forth.

The material instead of being submitted as in ordinary spinning to the usual apparatuses which divide it longitudinally in several parts of which each one is twisted individually, is taken from the doffing cylinder by a comb having a reciprocating motion toward and from the cylinder, the material so taken being gradually formed into a roll by the aid of a roller located close to the comb and revolving in the same direction as the doffing cylinder before referred to. The material so accumulated is drawn out by the action of side rollers practically in the plane of its length through one or more revolving, twisting, or spinning wheels which may be formed with a hollow shaft and a bell mouthed opening thereto.

To clearly explain the invention reference is made to the accompanying drawings, in which—

Figures 1, 2 and 3 are respectively a section, an elevation and a plan of the collecting, twisting and drawing portions of the apparatus the views being partially diagrammatic. Fig. 4 is an elevation of an ordinary form of wool carding engine having my improvements applied thereto for the purpose of carrying out the spinning of the above described materials. Fig. 5 is an end view of same. Fig. 6 is a plan, and Fig. 7 is a section of the twisting pulley.

Referring to Figs. 1, 2 and 3—1 is the doffing cylinder and 2 the doffing comb which serves to remove the material 3 from the doffer. The sheet of material detached by the comb 2 is prevented from advancing beyond a certain point by means of the roller 4 which rotates in the same direction as the doffer and which causes the sheet of material to accumulate in the form of the roll 5 from each end of which the material is drawn out by two pairs of rollers 6. 6 after having been previously submitted to torsion by passing through the centers of pulleys 7. 7. From the rollers 6 the drawn and twisted thread or sliver may be wound upon spindles of any suitable kind. The twisting pulleys 7. 7 are in the same plane as the mass 5 which has accumulated between the doffer 1 and roller 4. The sheet of material is thus transformed directly into a thread from the time of its production or formation into the roll 5. It will be evident that by causing the speed of rotation of the drawing rollers 6. 6 to vary, threads of different thicknesses can be readily produced.

As shown in the figures referred to the roll 5 is being drawn out from both ends but by drawing it out from one end only a considerably thicker thread can be produced.

In Figs. 4 to 7 the main cylinder 8 is mounted on the shaft 9 carried by the framework 10 and is driven by the fast pulley 11. The feeding apron 13 is adapted to deliver the material to the feed rolls 14, 14 from which it is taken by the stripping and working rolls to the doffer 1, the sheet of material being detached from the latter by the comb 2 which is attached to the shaft 15 mounted in the bearings 16. 16 and receiving an oscillating movement by means of an arm 17 which is attached by a connecting rod 18 to a disk 19 keyed upon a shaft 20. The shaft 20 receives movement from the driving shaft 9 by means of a belt which passes around the pulleys 21, 22 the former being on the shaft 20 and the latter on the main shaft.

The doffer 1 whose shaft 23 is mounted in the bearings 24, 24 receives its movement in

the ordinary way by means of the gear wheels 25, 26 driven by the pulleys 27. 27 and belt 28.

The roller 4 which collects the sheet 3 and causes it to accumulate in the form of a roll 5 is mounted on a shaft 29 supported by bearings 30. 30 said shaft being provided at one end with a gear wheel 31 which engages with a corresponding wheel 32 secured on a shaft 33 mounted in bearings 34 of which only one is shown. The shaft 33 is fitted with a grooved pulley 35, driven by a rope 36 from a pulley 37 on the main shaft 9.

The twisting pulley 7 shown detached in Fig. 7 has a flaring mouth and receives its motion from a rope 38 driven by a pulley 39 from the shaft 20. The pulley 7 is mounted in some suitable support which is not shown, from which it may be readily removed, so that pulleys having central holes of varying sizes may be substituted for the purpose of producing different sizes of threads the torsion being proportionate always to the speed of rotation of the pulley. The rollers 6 6 (of which one set only is shown in the machine being described) serve to draw out the spread 40 after it has passed through the pulley 7, and are of any ordinary construction. They are coupled together by gear wheels and are suitably mounted and preferably operated from the shaft 33 by means of bevel wheels or like gearing.

One or more twisting or spinning wheels and pairs of drawing rollers may be placed at either end of the cylinder, but as a rule one set at each end will generally be sufficient. By varying the size of the opening through the twisting wheels and the speed of rotation of the various parts the size of the cord or twisted fiber produced can be varied. After having passed the drawing rollers the thread 40 is wound upon a horizontal spindle or roller 42 the rotary movement of which is obtained by its friction against a wooden roller 41 driven by any suitable means, or the winding may be effected by any other suitable apparatus.

In the spinning of peat, the fibrous parts are first separated from the material and are then treated by washing, drying, beetling and hackling before being passed to the carding machine.

In the case of cotton waste, the material is treated in a dry state, *i. e.*, without a preliminary treatment with oil or a greasy body which would be necessary in attempting to spin it by the ordinary apparatus.

An advantage of the apparatus is that it is possible to make a thread, yarn or cord, of the thickness or diameter required by one operation instead of as usual making several threads and doubling them to make the heavier numbers.

What I claim is—

In an apparatus for spinning fibrous materials, the combination with a doffing cylinder and comb, of a collecting roller parallel with said doffing cylinder and rotating in the same direction therewith, and means for twisting and drawing the material, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

NICOLAS CUPERS.

Witnesses:
VALBERT MORIS,
L. NONN.