

(No Model.)

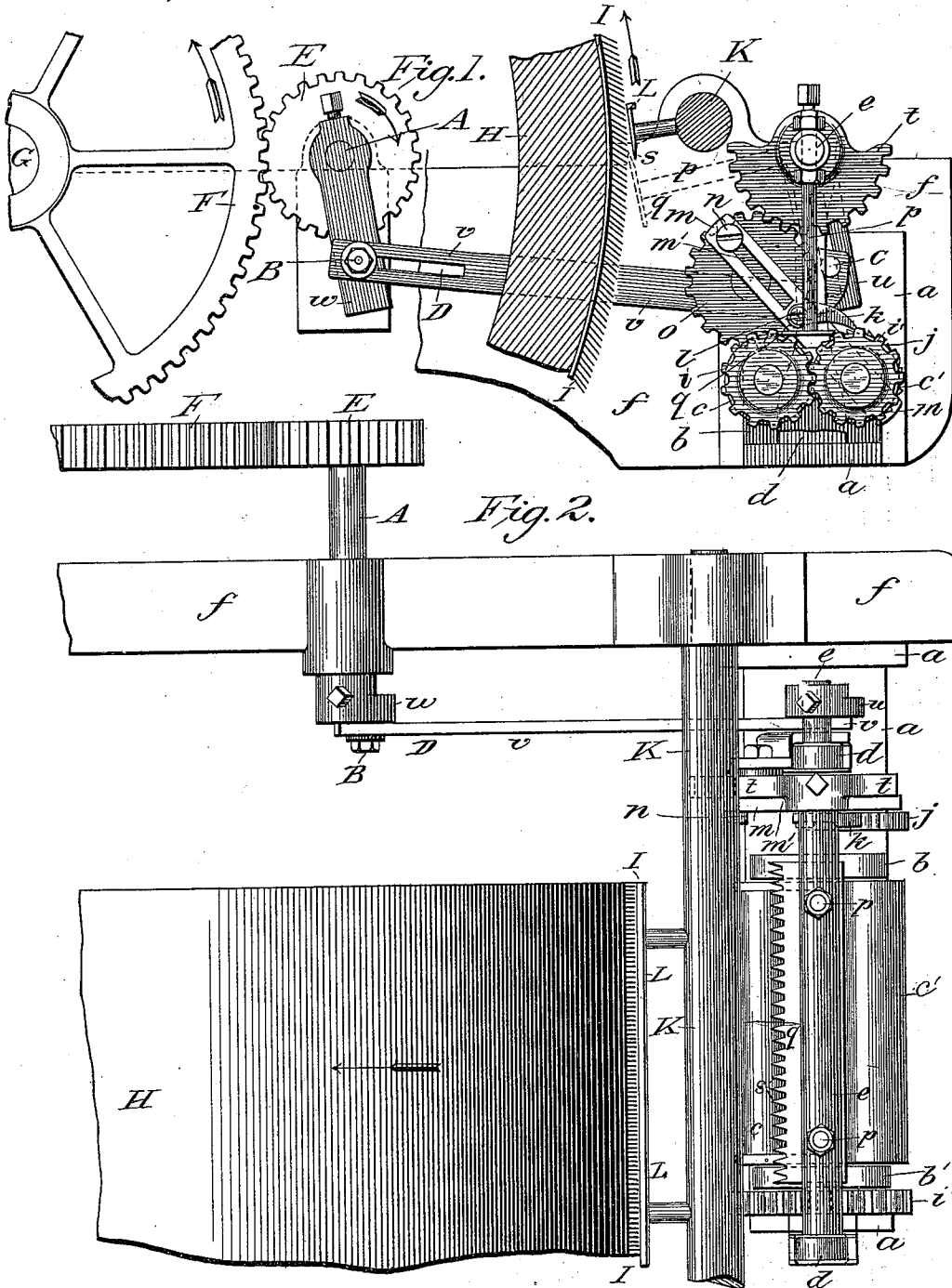
2 Sheets—Sheet 1.

R. W. DUXBURY.

ART OF MAKING ROVING FOR THE MANUFACTURE OF SPOTTED OR
PARTY-COLORED OR CLOUDED YARN.

No. 421,824.

Patented Feb. 18, 1890.



Witnesses,
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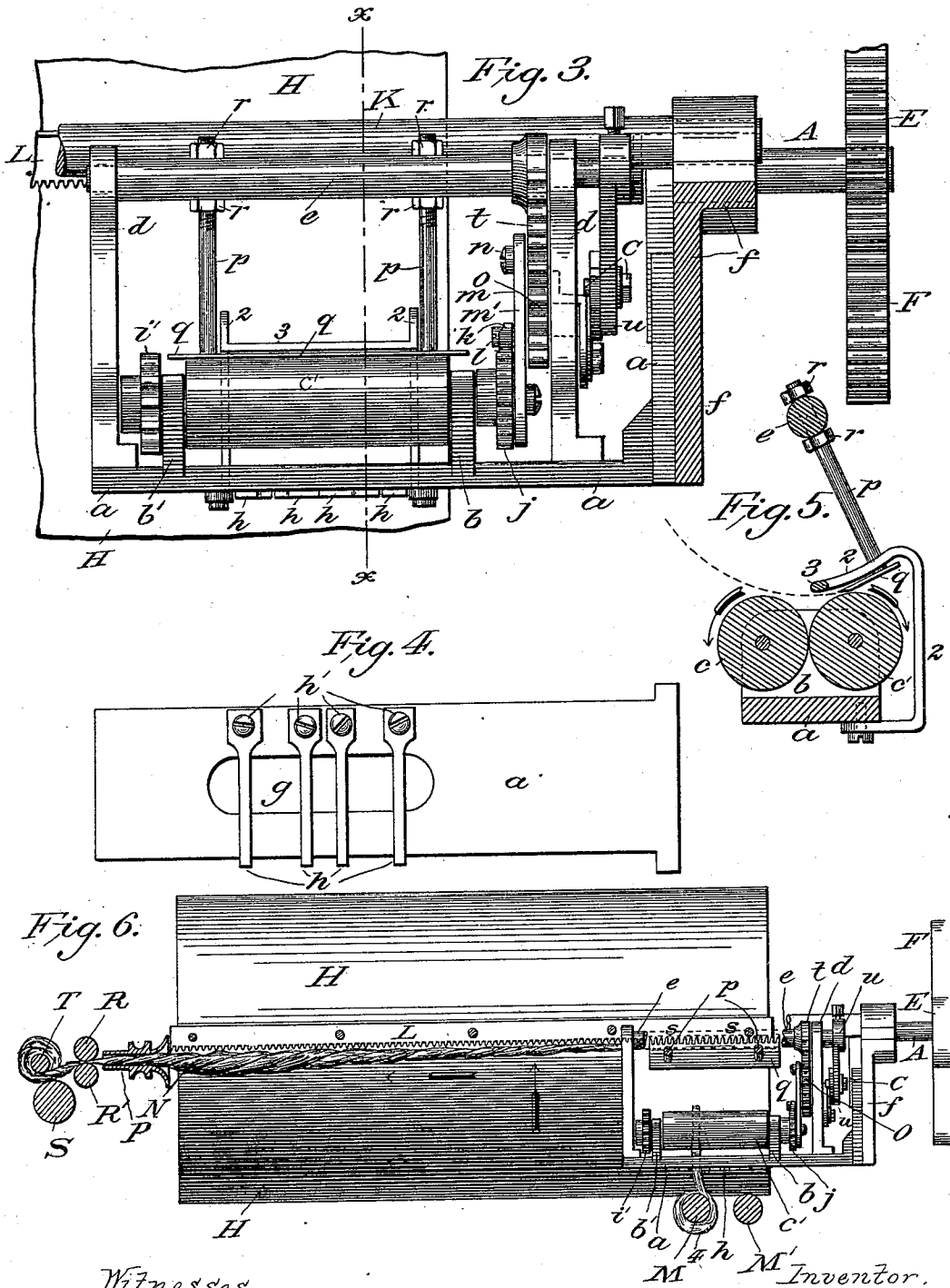
Inventor,
Robert William Duxbury
 By *W. Davidson Jones*
 his attorney

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UNITED STATES PATENT OFFICE.

ROBERT WILLIAM DUXBURY, OF AMSTERDAM, NEW YORK, ASSIGNOR OF
ONE-HALF TO GEORGE M. HEWITT, OF SAME PLACE.

ART OF MAKING ROVING FOR THE MANUFACTURE OF SPOTTED OR PARTY-COLORED OR CLOUDED YARN.

SPECIFICATION forming part of Letters Patent No. 421,824, dated February 18, 1890.

Application filed September 16, 1889. Serial No. 324,091. (No model.)

To all whom it may concern:

Be it known that I, ROBERT WILLIAM DUXBURY, a citizen of the United States of America, residing at the city of Amsterdam, in the county of Montgomery and State of New York, have invented a certain new and useful Improvement in the Art of Making Roving for the Manufacture of Spotted or Party-Colored or Clouded Yarn; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters and figures of reference marked thereon, which form a part of this specification, for the purpose of exhibiting and illustrating my method and the manner of reducing the same to practice.

The object of my invention is to produce yarn of varying colors, as may be desired, by introducing at intervals additional stock of any desired color into the sliver as it is combed from the "doffer-card" of a set of cards usually called the "second breaker."

It may be well here to observe that the set of cards in connection with which I practice my invention consists of and is usually known as the "first breaker," "second breaker," and "finisher." The crude or uncarded stock is primarily fed to the first breaker. From the first breaker it is fed to the second breaker. While the stock is being combed from the doffer-card of the second breaker, I introduce at intervals (preferably with certain mechanical devices adapted for that purpose, which I will hereinafter refer to, to more fully illustrate and show the working of my invention) the different-colored stock previously prepared in slivers and contained upon spools provided for that purpose, this colored stock being added while the sliver is being combed from the doffer-card by the "doffer-comb" and drawn crosswise and wound into spools by a pair of draw-rollers and a revolving trumpet, which are placed at the extreme end of the doffer-card. These last-mentioned spools of sliver containing the different-colored additional stock thrown therein at intervals are placed upon racks adapted for that purpose, and the contents thereof are fed into the finisher, drawn

and carded in the usual and ordinary manner, and delivered by the "doffer-rings" to the action of the "rub-rollers" as the roving passes to and is wound upon the long spools, from whence it is spun into yarns by the spinning jacks or mules, thereby producing yarn of varying colors, which, when knitted or woven, produces a beautiful and very desirable cloth not heretofore produced.

To practice my invention I employ certain mechanical devices. However, my method is susceptible of operation without the aid of any particular mechanical devices. As an illustration, the additional colored stock may be introduced by hand into the sliver while being combed from the doffer-card and produce fair results. Automatic mechanical devices are preferable, for the reason that the results are more perfect and satisfactory.

Referring to the accompanying drawings, which exhibit the mechanical devices just above referred to and making a part of this specification, Figure 1 is a sectional elevation, in part, of a machine employed in carrying out my invention. Fig. 2 is a plan. Fig. 3 is a front elevation. Fig. 4 is a view of the adjustable guides through which the additional colored stock is passed to the sliver that is combed from the doffer-card. Fig. 5 is a sectional elevation on the broken line xx in Fig. 3, and Fig. 6 is a longitudinal elevation exhibiting the line of travel of the sliver as combed from the doffer-card containing the additional colored stock thrown in at intervals.

To practice my invention, I attach to the second breaker of a set of cards, in such position as I will hereinafter fully describe, mechanism which, in connection and operation with the doffer-card, doffer-comb, and side-drawing mechanism, introduces or throws at intervals different-colored stock into the sliver at the right-hand end (see Fig. 6) of the doffer-card and doffer-comb which the sliver first starts to pass to the revolving trumpet and side-drawing rolls and spool at the left-hand side or end of the card.

It may be well here to remark that the mechanical devices which I am about to describe constitute and comprise the substance of a coapplication filed September 27, 1888,

Serial No. 286,516, now pending before the Patent Office for Letters Patent, for the improved machinery employed to practice my process.

5 I construct the frame *a* (see several figures of the drawings) provided with the boxes *b b'*, in which are journaled the rollers *c c'*. I also secure to the frame *a* the standards *d*, into which standards the rock-shaft *e* is journaled, 10 all substantially as shown. The frame *a*, I secure to the inside of the cast-iron or wooden frame *f* of the carding-machine with bolts in the general relative position, as shown and described. Centrally located, as shown, in 15 the bottom of the frame *a*, I form the oblong perforation *g* and provide it with guides *h*, extending crosswise of the said perforation *g* and secured with screws *h'* to the frame *a*, all substantially as shown in Fig. 4 of the 20 drawings. These guides (see Fig. 4) may be increased or diminished in number, as occasion may require, to keep separate the different-colored slivers fed from the spools *M M'* to the rollers *c c'*. I secure to the lower 25 portion of the frame *a* (see Figs. 3 and 5) the angular stop-rod 2, with the horizontal portion 3 extending lengthwise and parallel with the comb *q* and rollers *c c'*, so that the comb *q* will clear the surface of rollers *c c'* and the 30 under portion of the stop-rod 3, thereby preventing the stock or sliver which passes up between the rollers *c c'* from yielding to the stroke of the comb *q* until the portion caught by the teeth of the comb is torn off by the 35 comb *q*, thereby securing perfect work. Upon the journals of the rollers *c* and *c'* and outside of the box *b'*, I secure the cog-wheels *i i'*, which engage each other and cause the rollers *c c'* to revolve in unison.

40 *j* is a ratchet-wheel secured to the inner end of the journal of the roller *c'*, substantially as shown. (See Figs. 1, 2, and 3.)

k is a pawl secured by the screw or stump *l* to the lever *m*, which operates or revolves the 45 pair of rollers *c* and *c'*. The lever *m*, just above referred to, is pivoted at its lower end on the shaft of the roller *c'*, and is provided with a slot *m'*, that receives therein the stump or screw *n*, which is secured in the side of 50 the gear-wheel *O*. The stump *n* passes freely lengthwise through the slot *m'*.

In the rock-shaft *e*, I secure the arms *p*, having attached thereto the comb *q*. The comb *q* is adjustable by means of the adjusting-nuts *r*. (See Fig. 3.) This comb *q* is 55 provided with teeth *s* (see Fig. 2) upon the forward side.

t is a sector-gear engaging the gear-wheel *O*, containing the screw or stump *n*. This 60 sector-gear is secured to the rock-shaft *e*, which carries and operates the comb *q*, and is driven or oscillated by the arm *u*, connection *v*, and crank *w* on the shaft *A*. This connection *v* is adjustable lengthwise between 65 the stump or bolt *B* in crank *w* and the stump or bolt *C* in the arm *u* by securing the bolt *B* at any desired place in the slot *D*.

The shaft *A* is provided with a gear-wheel *E*, which engages the large gear-wheel *F* upon 70 the main shaft *G* of the doffer-card *H*.

The doffer-card *H* is provided with the card-clothing *I* in the usual and ordinary 75 manner, which is so well understood that I consider it unnecessary to fully describe it, and is revolved by a small gear-wheel engaging the master gear-wheel *F* upon the shaft 75 *G*. This small gear-wheel is upon a shaft containing a pulley, through which power is communicated to operate the card-cylinder. Said pulley and small gear-wheel are not 80 shown in the drawings, and the working thereof is so well understood by those skilled in the art that a minute description is unnecessary.

K is the rock-shaft of the carding-machine, 85 journaled in suitable boxes and having attached thereto the doffer-comb *L*, which vibrates or oscillates rapidly by means of an eccentric, or by any of the well-known appliances in common use, and combs from the 90 card-clothing *I* the stock being operated upon.

M (see Fig. 6) are spools containing the colored "sliver" 4, that is torn or combed off by 95 the comb *q* and deposited in the sliver *N* as it is combed from the doffer-card *H* by the doffer-comb *L*.

P (see Fig. 6) is the revolving trumpet to 100 condense and slightly twist the sliver *N* as it is drawn crosswise and through the said trumpet *P* by the side-drawing rollers *R* and *R'* and friction-roller *S*, and wound into a bobbin or spool *T* by friction with the roller *S*.

The direction of motion is indicated by the arrows, and like letters and figures of refer- 105 ence indicate like parts in each of the several figures of the drawings.

To illustrate the working of my method, I will assume that an ordinary set of cards, as heretofore stated, consisting of the first 110 and second breakers and finisher, is working white stock or white wool, also that the second breaker is provided with the special devices just above described, and shown in the several views of the accompanying 115 drawings, to enable me to practice my invention. I have named white stock as a base to operate upon. This may, however, be replaced by any other colored base or ground color. As an illustration, scarlet or black may be 120 used with the same results. Motion is communicated to the set of cards from any prime motor, and through the medium of the gear-wheel *E*, crank-shaft *A*, crank *w*, connection *v*, and arm *u* to the rock-shaft *e*, thereby 125 vibrating or oscillating the comb *q*, sector-wheel *t*, gear-wheel *o*, which, through the stump or screw *n*, operates the lever *m* and pawl *k*, which lever in vibrating causes the pawl *k* to engage the ratchet-wheel *j*, and causes the rollers *c* and *c'*, with the gear-wheels *i* and *i'*, 130 to partly revolve forward in the direction of the arrows (see Fig. 5) at each oscillation of the sector-gear *t* and gear-wheel *o*. I will here remark that the length of stroke of the

pawl-lever *m*, and consequent movement of the rollers *c c'*, may be regulated as desired by adjusting the bolt *C* of the connection *v* in the slot in the arm *u* at a greater or less distance from the rock-shaft *e*; also, the speed of this special attachment may be increased or decreased by substituting a larger or smaller gear-wheel in place of the gear-wheel *E*. A set of cards, as hereinbefore described, is supposed to be working white stock. The spool *M* is supplied with scarlet sliver 4, which has been prepared in the usual and common manner by cards for that purpose. The end of the scarlet sliver from the spool *M* is introduced into the bite of the rollers *c* and *c'*. (See Fig. 6.) At each revolution of the crank-shaft *e* the comb *q* is vibrated forward from the position shown in Fig. 5 to the position shown in broken lines in Fig. 1 and back to the point of starting. In these oscillating movements the said comb *q* sweeps close to the surface of the rollers *c c'* and the under surface of the stop-rod 3. (See Fig. 5.) Through the medium of the connecting mechanism, as the comb *q* vibrates the rollers *c* and *c'* are revolved forward a short distance at each vibration, thereby drawing between the rollers *c c'* the scarlet-colored sliver 4 a short distance. As the comb *q* makes the return-stroke it sweeps behind the stop-rod 3 the upper end of the sliver 4. When the comb makes the forward stroke, the teeth of the comb strike into the sliver, which is held below by the rollers *c c'* and above by the stop-rod 3, and is combed off in uniform quantities and carried up by the comb *q* into the sliver *N* as it is combed from the doffer-card *H* by the doffer-comb *L* at the intersection of the combs *L* and *q* and near the points of the card-clothing, as shown in Fig. 1 at *s*, where it is gradually rolled into and with the sliver *N* by the coaction of the comb *L*, trumpet *P*, and side-drawing rolls *R* and *R'*, and wound upon the spool *T* by the friction-roll *S*. By continuing the operation as just above described the sliver *N* has at intervals intimately placed therein colored stock, which is taken and fed into the "finisher-card" of the set of cards in

the usual and ordinary manner, which is well understood by those skilled in the art, and re-carded and run into roving, and wound on long spools in sections, which spools are taken to the spinning jack or mule and spun into yarn in the ordinary and usual manner, thereby producing yarn or thread having colored sections of equal lengths at equal and uniform distances apart, which, when woven or knit, produces a very desirable cloth which has not heretofore been produced.

In practicing my process I do not confine myself to the introduction of only one additional colored sliver into the sliver that is combed from the doffer-card, as a reasonable plurality of different-colored slivers 4 may be introduced at the same time through the medium of the feed-rollers *c c'* and guides *h*. I will here remark that I have introduced as many as five additional different colors at one time with perfect and satisfactory results.

In describing my improved method I have referred to special mechanical devices which I have discovered are adapted to effectually reduce my method into practice, and which devices, as heretofore stated, form the subject of a pending application for Letters Patent, and I only introduce them to illustrate the method of practicing my process.

What I claim as new, and desire to secure by Letters Patent, is—

The improvement in the art of making rovings for use in the manufacture of spotted or party-colored or clouded yarn, which consists in incorporating at intervals with a sliver, while it is being doffed from the doffer-cylinder of a second breaker, portions of stock of different color or kind, condensing the sliver thus formed, and then feeding the same into and recarding and forming the same into rovings in a finisher-card, as described.

In witness whereof I have hereunto subscribed my name and affixed my seal this the 11th day of September, 1889.

ROBERT WILLIAM DUXBURY. [L. s.]

Witnesses:

E. H. KRULBAUM,
PERRY KLIM.