

(No Model.)

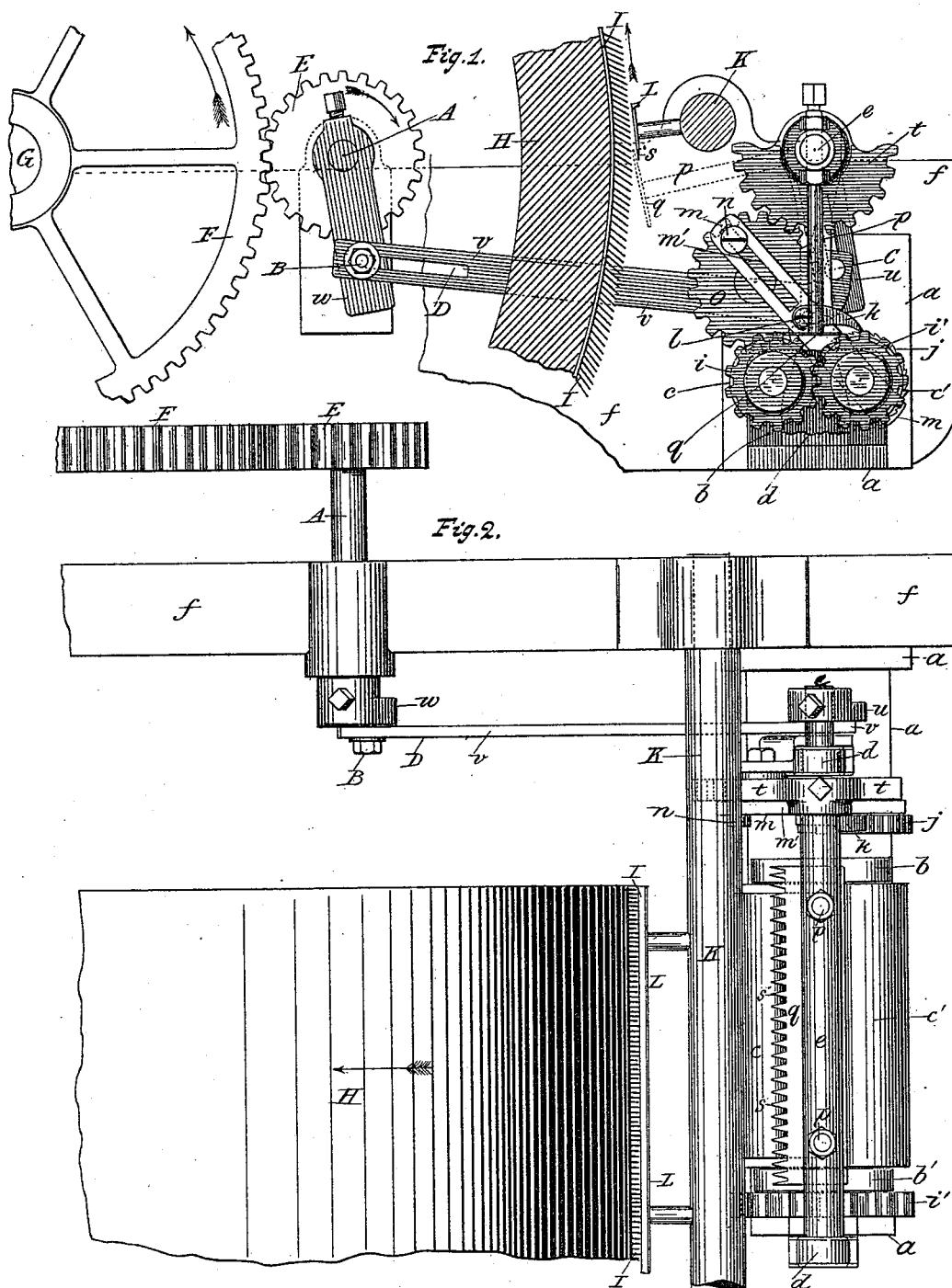
2 Sheets—Sheet 1.

R. W. DUXBURY.

CARDING MACHINE FOR PRODUCING SLIVERS OF VARYING COLORS.

No. 421,823.

Patented Feb. 18, 1890.



Witnesses.

J. H. Davidson

Inventor.

R. William Duxbury
By W. Davidson Jones atty

2 Sheets—Sheet 2.

Patented Feb. 18, 1890.



Witnesses.

J. H. Davidson

Inventor

Inventor.
R. William Duxbury
By W. Davidson Jones
att'y

UNITED STATES PATENT OFFICE.

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

CARDING-MACHINE FOR PRODUCING SLIVERS OF VARYING COLORS.

SPECIFICATION forming part of Letters Patent No. 421,823, dated February 18, 1890.

Application filed September 27, 1888. Serial No. 286,516. (No model.)

To all whom it may concern:

Be it known that I, ROBERT WILLIAM DUXBURY, a citizen of the United States, residing at the city of Amsterdam, in the county of Montgomery and State of New York, have invented certain new and useful Improvements in Carding-Machines for Producing Slivers of Varying Colors; 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.

Referring to the drawings making a part of this specification, Figure 1 is a sectional broken elevation of a part of a carding-machine embodying 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 as it is combed from the "doffer-card." Fig. 5 is a fragment of a section on the broken line *xx* in Fig. 3; and Fig. 6 is a front elevation exhibiting the line of travel of the sliver as combed from the doffer-card, and containing the additional colored stock thrown in by my improvements and showing one position of the auxiliary comb.

The object of my invention is to produce a knitted fabric of varying shades or colors and circumferential stripes without additional attachments to a knitting-frame as has heretofore been necessary, and consequently I produce yarn of varying colors as may be desired by introducing into the sliver as it is combed from the doffer-card additional stock of the desired color. This I accomplish by attaching my invention to the "second breaker" of a set of cards in such position as I will hereinafter fully describe, 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 (see Fig. 6) end of the doffer-card and doffer-comb, from 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. This I accomplish by constructing 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* by any of the well-known methods the standards *d*, and into these standards *d* the rock-shaft *e* is journaled, all substantially as shown. 55

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 in the bottom of the frame *a*, I form the oblong perforation *g* and provide it with guides *h*, extending crosswise of the perforation *g* and secured with screws *h'* to the frame *a*, as shown in Fig. 4 of the drawings. These guides *h* (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'*, &c., to the rollers *c* and *c'*. I secure to the lower 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* and *c'*, so that the comb *q* will clear the surface of rollers *c* and *c'* and the 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 comb, 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. 65 70 75 80

j is a ratchet-wheel secured to the inner end of the journal of the roller *c'*. (See Figs. 1, 2, and 3.) 85

k is a pawl secured by the screw or stump *l* in the lever *m*, and operates or revolves the pair of rollers *c* and *c'*. The lever *m* just referred to is pivoted at its lower end on the shaft of roller *c'*, and is provided with a slot *m'*, that receives therein the stump or screw *n*, which is secured in the side of 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*, I make adjustable with the adjusting-nuts *r*. (See Fig. 3.) This comb *q* is provided with teeth *s* (see Fig. 2) upon the forward side. 90 95 100

t is a sector-gear engaging the gear-wheel

o containing the screw or stump *n*. This sector-gear is secured to the rock-shaft *e*, which carries and operates the comb *g*, and is itself driven or oscillated by its arm *u*, connection *v*, and crank *w* on the shaft A. This connection *v* is adjustable lengthwise between 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 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 manner, and is so well understood that I do not deem it necessary to fully describe it, and is revolved by a small gear-wheel engaging the master gear-wheel F upon the shaft G. This small gear-wheel is upon a shaft containing a pulley, through which power is communicated to operate the card-cylinder, which said pulley and small gear-wheel are not shown in the drawings, and are so well understood by those skilled in the art that a minute description is unnecessary.

K is the comb-shaft of the carding-machine journaled in suitable boxes, 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 card-clothing I the stock that is being operated upon.

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

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

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

The operation of my invention is as follows: To illustrate, I will assume that an ordinary set of cards consisting of the "first" and "second breaker" and "finisher" is working white wool or white stock; also, that the second breaker is provided with my invention just above described, and shown in the several views of the accompanying drawings. However any other colored stock may form the base or ground color—as, for instance, scarlet or black with the same results. Motion is communicated to the set of cards from any prime motor and to my device through the medium of the gear-wheel E, crank-shaft A, crank *w*, connection *v*, and arm *u* on the rock-shaft *e*, thereby vibrating or oscillating the comb *g*, sector-wheel *t*, and gear-wheel *o*, which through the stump or screw *n* operates the lever *m* and pawl *k*, which causes the

pawl *k* to engage the ratchet-wheel *j*, and causes the rollers *c* and *c'*, that are geared together with the cog-wheels *i* and *i'*, to partly revolve forward in the direction of the arrows (see Fig. 5) at intervals or at each oscillation of the sector-gear *t* and gear-wheel *o*.

It may be well here to observe that the length of stroke or oscillation of the pawl-lever *m*, and consequently forward motion of the rollers *c* and *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 relative speed of my attachment may be decreased or increased by substituting a larger or smaller gear in place of the gear-wheel E.

The set of cards, as hereinbefore stated, are supposed to be supplied and working white stock, and the spool M supplied with scarlet sliver 4, which has been prepared in the usual and common manner with a set of 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 A the comb *g* is vibrated forward from the position shown in Fig. 5 to the position shown in Fig. 6, and in broken lines in Fig. 1 and backward to the first position named in Fig. 5. In these movements the comb *g* sweeps close to the surface of the rollers *c c'* and close to the under surface of the stop-rod 3. (See Fig. 5.) It is evident that at the backward movement of the comb *g* the rollers *c* and *c'* are revolved forward a short distance, thereby drawing up between the rollers a short distance the scarlet-colored sliver 4. As the comb *g* passes backward under the stop-rod 3 it sweeps or carries behind the stop-rod 3, the upper end of the sliver 4. When the comb makes the forward or return motion, the teeth of the comb strikes into the sliver, which is held below by the rollers *c c'* and above by the stop-rod 3, and it is torn or combed off in uniform quantities and thrown or carried up by the comb *g* 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 *g* and the points or the extremity of the card-clothing, as shown in Fig. 1 at *s*, when it is gradually rolled into the sliver N by the rolling process caused by the trumpet P and side drawing-rolls R and R', friction-roll S, and spool T. As the cards are worked, this operation is repeated, thereby intimately placing in the sliver N at intervals scarlet-colored stock, which said sliver is taken to the finisher card and run into roping, and thence to a 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 into cloth on a loom or on a knitting-machine, produces cloth having stripes of different color of uniform width.

I have described my invention as using

one additional color, which is thrown in the sliver N by the comb *q*. I do not confine my invention to the use of only one additional color, as an additional colored sliver may be introduced at the same operation from the spool M', (see Fig. 6,) or any reasonable additional number of different-colored slivers may be used with equal facility and fed into the rollers *c c'* through the guides *h* at the same time.

It may be well here to remark that I have introduced as high as five additional different-colored slivers at one time into the sliver N with perfect and satisfactory results. Knitted goods of different varieties, including stockings and socks manufactured from yarn produced, as described, with my invention, are beautiful, desirable, and cheap to manufacture.

I will here observe that the method embodied in the mechanical devices constituting the subject-matter of this application forms the subject-matter of a co-application for Letters Patent now pending, filed September 16, 1889, Serial No. 324,091.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination, with the doffer-card and doffer-comb, which jointly produce a sliver which is drawn in the direction of the length of the doffer-card, of the vibrating auxiliary comb, means for drawing the sliver from the doffer in the direction mentioned, and means for actuating the auxiliary comb, whereby a sliver of one color or kind of stock is introduced at intervals into and incorporated in the body of the sliver from the doffer-card, substantially as and for purposes set forth.

2. The combination, with the doffer-card and doffer-comb, which jointly produce a sliver of one color or kind of stock, and a revolving trumpet and drawing-rollers at one side or end of the card and comb, of the vibrating comb *q* and means to actuate the auxiliary comb, whereby portions of a sliver of another color or kind of stock are intermittently transferred into the body of the first sliver and incorporated at intervals in the body of the same, substantially as and for the purposes set forth.

3. In a carding-machine, the combination of the doffer-card, doffer-comb, revolving trumpet, side drawing-rollers R R', a pair of auxiliary rollers *c c'*, an auxiliary comb *q*, and devices for actuating the said rollers and comb operated in connection with a carding-machine, whereby stock may be combed from an auxiliary sliver at intervals as it is passed through the pair of rollers *c c'* and thrown into and incorporated with the sliver combed from the doffer-card by the doffer-comb and drawn lengthwise of the doffer-card and wound into a spool, as shown, set forth, and described.

4. In a carding-machine, the doffer-card and doffer-comb, combined with the side drawing mechanism, the rollers *c c'*, and a rock-shaft *e*, having a comb *q* in close proximity to the pair of rollers *c c'*, and devices for actuating the rock-shaft and rollers, as and for the purposes herein shown and described.

5. The combination of the doffer card and comb, the revolving trumpet and side drawings-rollers, the rollers *c c'*, the said rollers being provided with gears *i i'* and the roller *c'* with the ratchet-wheel *j*, the oscillating shaft *e*, having secured thereto the comb *q*, the lever *m*, provided with the slot *m'*, and pawl *k*, engaging the ratchet-wheel *j*, the gear-wheel *o*, provided with the stud or pin *n*, the sector-gear *t*, secured to the rock-shaft *e*, the arm *u*, connection *v*, arm *w*, cog-wheel E, and master-wheel F, all as shown and operating as set forth.

6. The combination of the doffer-card, the doffer-comb, the revolving trumpet, the side drawing-rollers R R', and the rollers *c c'* and auxiliary comb, the former operating at intervals, and means to operate the auxiliary comb and the rollers, substantially as described and set forth, whereby stock from an additional or supplementary sliver can be transferred at intervals to and incorporated in the sliver combed from the doffer-card, as set forth.

In witness whereof I hereunto subscribe my name and affix my seal this the 21st day of September, 1888.

R. WILLIAM DUXBURY. [L. s.]

Witnesses:

W. DAVIDSON JONES,
ERNEST H. KURLBAUM.