(No Model.)

P. DURANÇON.

MECHANISM FOR OPENING AND SEPARATING THREADS OF HANKS OR SKEINS.

No. 334,113. Patented Jan. 12, 1886.

Fig. 1.

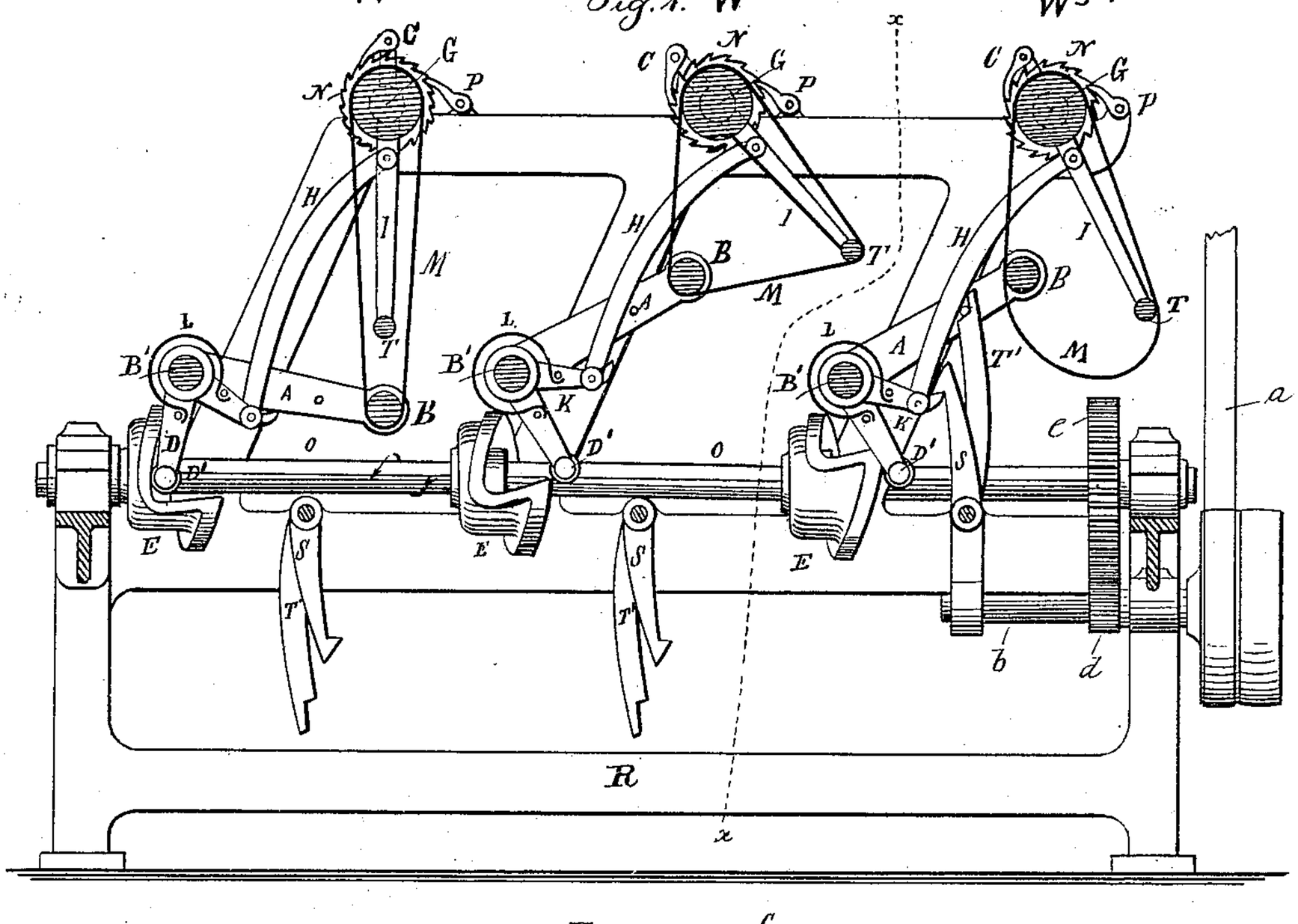
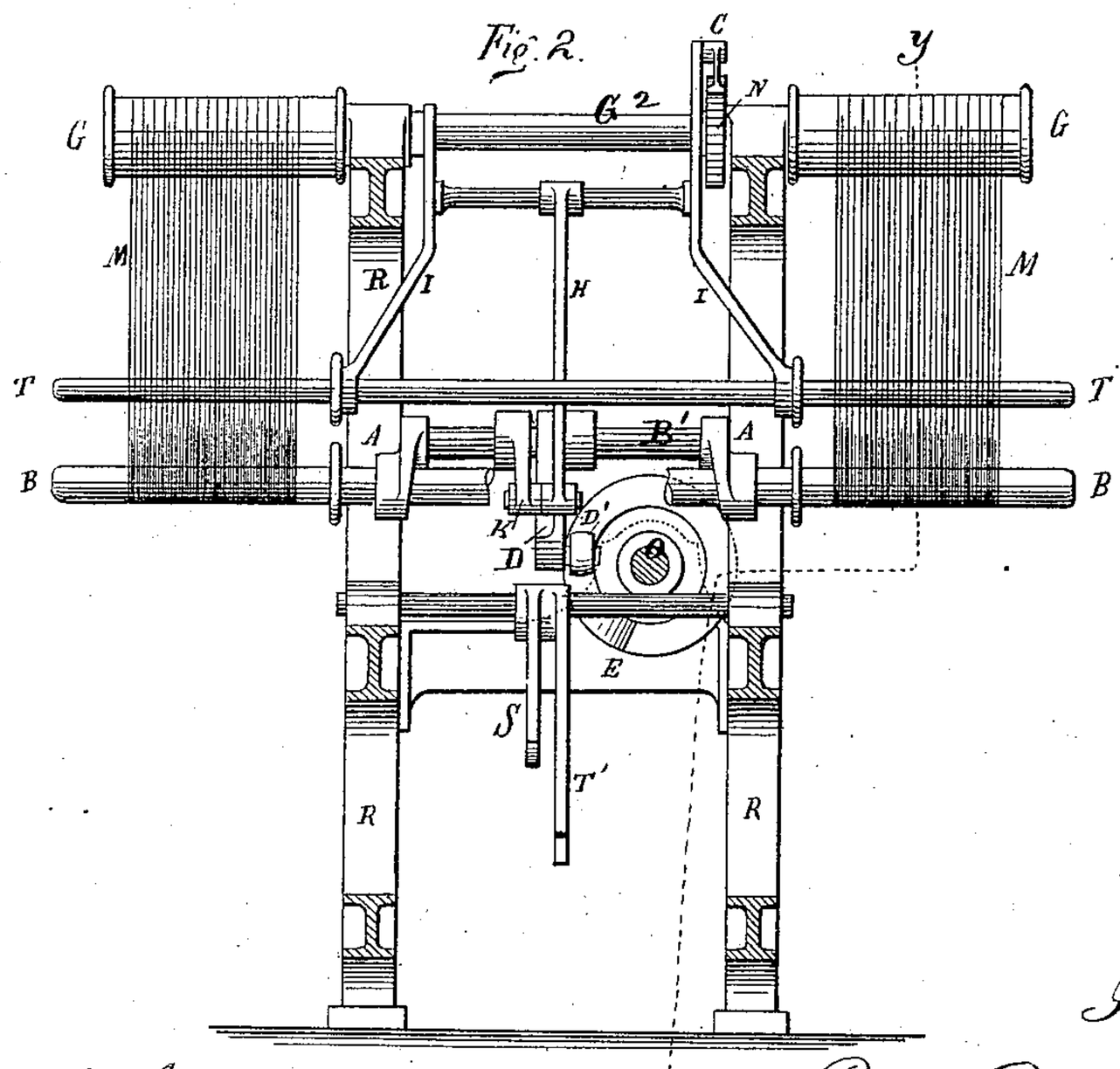


Fig. 2.



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PIERRE DURANÇON, OF LYONS, FRANCE.

MECHANISM FOR OPENING AND SEPARATING THREADS OF HANKS OR SKEINS.

SPECIFICATION forming part of Letters Patent No. 334,113, dated January 12, 1886.

Application filed January 2, 1885. Serial No. 151,726. (No model.) Patented in France September 16, 1884, No. 162,002.

To all whom it may concern:

Be it known that I, PIERRE DURANÇON, a citizen of the Republic of France, residing at Lyons, France, have invented an Improvement in Mechanism for Opening and Separating Threads of Hanks or Skeins, of which the following is a specification.

Before or after the various manipulations to which skeins or hanks of textile materials are subjected in dyeing it is necessary to straighten, separately stretch, and equalize the filaments which have become mixed and crossed and contracted during the preceding operation. This work is now done by hand. The hank or skein is suspended by a pin, and the operator passes his two hands within the skein, and while he strikes with one hand the lower part of the skein a succession of quick blows he with the other hand keeps the skin taut and turns it on the pin to vary the place of the blow. The machine which forms the subject of this application for patent operates in a similar manner by means of two devices which take the place of the operator's hands, the hank being suspended from a roller that takes the place of the pin.

In the drawings, Figure 1 is a sectional elevation at the line *y y* of Fig. 2, and Fig. 2 is a cross-section at the line *x x* of Fig. 1.

In Fig. 1 I have shown three of the hank-opening devices. The number may be more or less. I will describe one of them. The skein or hank M, composed of the desired number of skeins is suspended by a roll or drum, G, which receives at the proper time a progressive rotary motion by means of the pawl C. The beater B is a cylinder or bar parallel with the drum G, and it is mounted at the end of a bent lever, A, upon a cross-shaft, B′, and a shorter arm, D, is provided with a roller, D′, that is acted upon by a cam, E, which cam at each revolution raises the beater to a certain height and allows it to freely fall with its weight increased, if necessary, by an additional weight or a spring. The cam E is upon a shaft, *o*, supported in bearings on the frame R, and upon this shaft *o* there is a gear-wheel, *e*, meshing with a wheel, *d*, on the shaft *b*, also supported in bearings in the frame R. The shaft *b* is the driving-shaft of the machine, and I have represented a belt, *a*, passing over a pulley on said shaft *b*, as the means for rotating the same. The tension device or bar T is suspended within the hank from the shaft G^2 by the arms I I, and said arms are free to oscillate upon said shaft.

K is a crank-arm loose upon the cross-shaft B′, and H is a link pivoted to a cross-bar between two arms, I I, which link extends to the crank-arm K.

L is a spring one end of which is connected to the crank-arm K and the other end is connected to the arm D.

One arm I carries the pawl C, which acts on the ratchet-wheel N, secured to the drum G, and the backward movement of the drum is prevented by the pawl P.

I prefer to make the machine double, so that the rollers G are at the ends of a cross-shaft, G^2, supported in the frames R R, which frames also support the shaft B′, and are provided with end bars and bearings for the shaft *o*. The bars T and B also cross the machine and extend beyond the frames the same distance or rather farther than the rollers G, the lever-arms A and I being in pairs. I have shown in Fig. 1 three sets of the opening devices, but more or less in number may be used.

The set of devices at W illustrate the positions of the parts when the beater B has fallen and struck a blow upon the inner surface of the hanks or skeins. The set of devices at W^2 illustrate the positions of the parts when the hanks are under tension and the beater raised and ready to fall. The parts at W^3 are held in position for applying or removing the skeins or hanks.

The rotation of the shaft *o* and the cam E causes the lever-arm D to rock the shaft B′ and raise the beater B at the same time the spring L acts upon the arm K, and the link H pushes the tension-bar T and makes it act against the hank at one side, for keeping the threads taut. The length of movement of the tension-bar being a little greater than that necessary to spread the hank, the spring L is compressed and only a regular tension results. During this time the pawl C has moved the drum G and the hank has also been partially turned around so as to receive the blow of the beater B at another part of its length. This brings the parts to the position shown at

W^2, where the cam is passing away from the lever-arm D, and allowing the shaft B′ to turn and the beater to fall and carry with it the spring L, arm K, and tension-bar T, and the beater strikes sharply the bottom of the skeins or hank without having nevertheless ceased to to be in contact with the threads of such hank.

It will be noticed that the hank is never abandoned to itself and that it is moved at each blow in order that it may be struck at every part of its length, so that the threads are shaken apart, stretched, straightened, and equalized as efficiently as by hand-work.

To substitute another skein or hank, the beater B is stopped at its highest position, as shown at W^3, and the tension-bar T moved back toward the center against the action of the spring L, which gives a sufficient slack to render the removal or finishing operation easy. This result can be obtained at one operation by throwing up a double pawl, S T′, during the ascent of the beater, one part, S, of the pawl holding the lever K and stopping the movement of the tension-bar at the desired point, and the other part, T′, blocking or holding the beater B at its highest point. The cam E then turns without producing any effect until the skeins or hanks have been removed and another substituted, or until the pawl S T′ is moved down and the parts again put in operation.

The object of using two drums, G, on the shaft G^2 and outside the frames and in extending the beaters B and tension-bars T also outside the frames is to operate upon two skeins at the same time and equalize the strain coming upon the beaters, tension-bars, and their supports and prevent the same becoming bent or injured.

The mechanism for actuating the beaters and tension-bars is contained between the two parallel frames R R, and the drums G and working portions of the beaters and tension-bars are outside the frames, which facilitates the application and the removal of the hanks.

There are openings in the frames to allow for the movements of the beaters and tension-bars. There may be any desired number of drums. One shaft, *o*, carries all the cams, and these latter are placed upon the shaft so as to produce the blows successively and cause the action of the machine to be regular. The motive power may be supplied by a belt from any suitable motor, or it may be supplied by a special motor placed at the end of the machine.

The drums, beaters, and tension-bars may be of metal or other material, according to the nature of the threads to be operated upon; or, if necessary, they may be covered with india-rubber.

I do not limit myself to the precise devices shown for giving the specified motions to the beaters and tension-bars.

I claim as my invention—

1. The combination, with the drum G, over which the skeins or hanks are passed, of the beater B and tension-bar T, and mechanism, substantially as specified, for operating the beater and the tension-bar, substantially as and for the purposes described.

2. The combination, with the drums G, cross-shaft G^2, and supporting-frames R, of the beaters B, arms A, link H, shaft B′, the tension-bars T, arms I, pawls C P, ratchet-wheel N, arms D K, spring L, shaft *o*, and cam E, substantially as set forth.

3. The combination of a drum and mechanism, substantially as specified, for imparting to the same a step-by-step rotation, a yielding tension-bar and beater acting within the skein, and mechanism, substantially as specified, for operating said tension-bar and beater, the beater to produce a blow upon the threads in the hank as it falls, and the yielding tension-bar to spread and stretch the hank, substantially as specified.

4. The combination, with the drum G, of the beater B, shaft B′, and spring L, the tension-bar T, the arms A I K D, link H, double pawl S T′, the shaft *o*, and cam E, substantially as specified.

The foregoing specification of my improvement in mechanism for opening and separating threads of hanks or skeins signed by me this 6th day of December, A. D. 1884.

PIERRE DURANÇON.

Witnesses:

IVIN RABILLOND,

JULES LEPNETTE.