(No Model.)

S. A. FLOWER & W. S. RHOADES.

FIBER CURLING MACHINE.

No. 547,751. Patented Oct. 8, 1895.

Fig. 1.

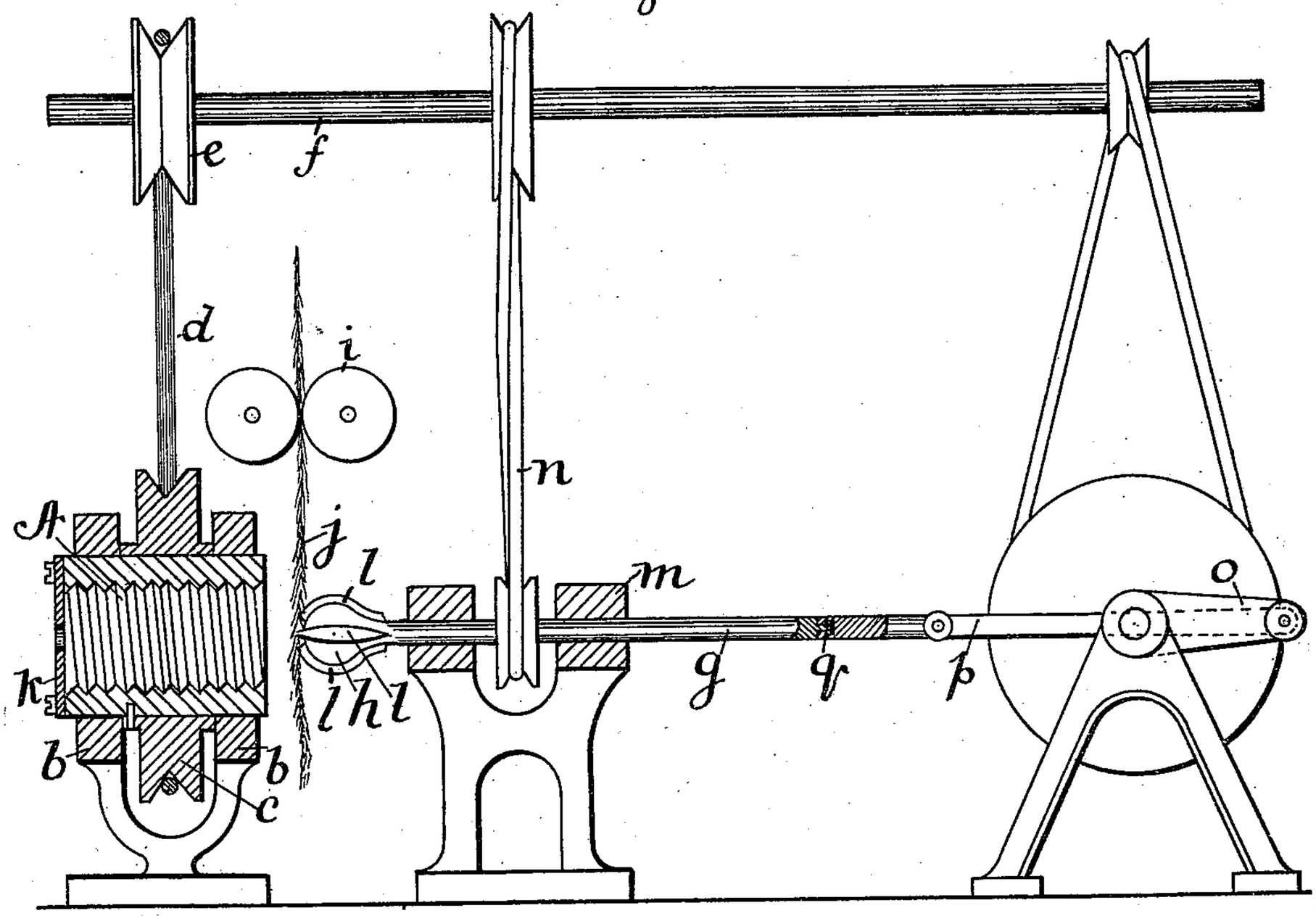


Fig. 2.

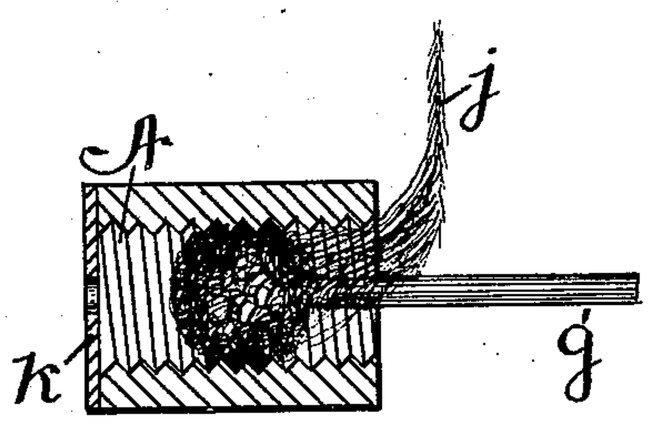


Fig. 3.

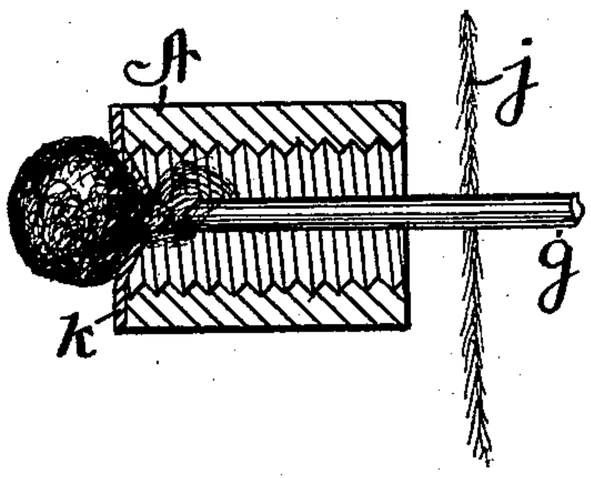
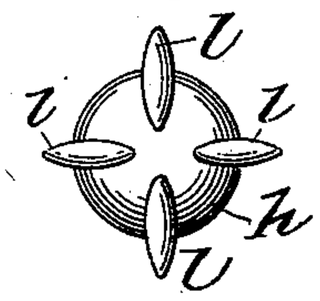


Fig. 4.



Witnesses.
H. J. Morgan
D. F. O'Malley

Inventors
Sam'l A Flower
Wm S Rhoades.
By A P Thayer
atty

UNITED STATES PATENT OFFICE.

SAMUEL A. FLOWER AND WILLIAM S. RHOADES, OF NEWARK, NEW JERSEY.

FIBER-CURLING MACHINE.

SPECIFICATION forming part of Letters Patent No. 547,751, dated October 8, 1895.

Application filed July 10, 1894. Serial No. 517,083. (No model.)

To all whom it may concern:

Be it known that we, SAMUEL A. FLOWER and WILLIAM S. RHOADES, citizens of the United States, and residents of Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Fiber-Curling Machines, of which the following is a specification.

Our invention relates to machinery for curling animal and vegetable fibers for upholstery purposes; and it consists, essentially, of a short tubular-rotating internally-threaded curling device, with which a reciprocating and rotating mandrel, having a fiber-balling head, is arranged for collecting bunches of fiber suitably supplied to it and to carry them through the twisting device and deliver them in balls of curled fibers, all as hereinafter fully described, reference being made to the accompanying drawings, in which—

Figure 1 is partly a side elevation and partly a sectional elevation of our improved fiber-curling machine. Fig. 2 is a detail, partly in sectional elevation and partly in side view, illustrating the process of the operation of the machine. Fig. 3 is another like detail further illustrating said process. Fig. 4 is an end view of the balling-head on a large scale.

A represents the tubular rotating internally-threaded curling device, which is substantially like a rather long screw-threaded nut. It is mounted horizontally in housings *b*, so as to revolve freely, and has a pull *c* by which it is to be rotated, as by the belt *d* running from the pulley *c* on the driving-shaft *f*, or may be driven in any other approved way. In this example of our invention we represent the said curling device with spiral threads, but good results may be had with threads formed in true planes.

g represents the mandrel having the balling-head *h*, said mandrel being arranged horizontally in the axial line of the bore of the curling device and in suitable proximity to one side thereof to be reciprocated through said curling device at the same time that it is being rotated on its own axis. Directly over the axial line of the mandrel and curling device, and on the side of the latter on which the mandrel is placed, and in close proximity to said side is a pair of feed-rolls *i*, by which the fibers to be curled are delivered, as in the sliver *j*, but the fibers may be fed by any other approved means, so that as they fall on the balling-head when it is withdrawn from the curling device A, it will gather a ball or wad of the same and will then carry it into and through the curler A, as indicated in Figs. 2 and 3, whereby the fibers will be effectually curled and set in stiff and lasting curls well adapted for high-grade upholstery goods.

At the opposite side of the curling device is an elastic stripper *k*, consisting of a rubber disk, in this instance, having a hole in the center, through which the ball of fiber is passed and which grips the mandrel behind the balls, as indicated in Fig. 3, and strips off and discharges the curled balls when the mandrel returns, but any other approved form of stripping may be employed. The ball-head has longitudinal ribs *l* adapted to catch and gather up the fibers hanging down by the side of the mandrel, as in Fig. 3, and also adapted to permit the curled balls to be stripped off.

The balls gathered on the head of the mandrel are parted from the sliver at or before the discharge of the curled balls, and the sliver is caught up again by the head when it returns to the hanging sliver. In this case the mandrel is mounted in the stand *m*, so as to rotate and slide freely with a belt *n* for rotating it and a crank *o* and connecting-rod *p* for reciprocating it, the connecting-rod being suitably swiveled to the mandrel, as indicated at *q*, for such connection. As the lengthwise movement of the mandrel is quite short, the pulley on the mandrel for the belt *n* may be fixed on the mandrel so as to reciprocate with it without interfering with the proper working of the belt, provided the belt is not too short, but said pulley may be secured by a feather and be confined against lateral movement with the mandrel, if preferred.

The curling device A will be rotated in the proper direction for the threads to cause the movement of the fibers forward through it when it is made with spiral threads and the mandrel will preferably be rotated in the reverse direction. Good results will be had with the mandrel rotated in the same direction

and preferably at higher speed. The head *h* will carry the balls through the curler when the threads of said curler are not spiral. The balls of curled fiber thus produced are to be afterward picked apart, as roped hair is treated. The curling device and the mandrel, or either alone, may be steam-heated for more effectually setting the curls, if desired.

The apparatus may be arranged upright with the mandrel either over or under the curling device and will work well either way, suitable feed apparatus being provided for so supplying the fibers.

We claim—

1. The combination of fiber curling apparatus consisting of the rotating tubular internally threaded curling device, the rotating and reciprocating balling mandrel, a ball stripper and means to feed the fibers thereto, said balling mandrel arranged to traverse the curling device substantially as described.

2. The combination of fiber curling apparatus consisting of the rotating tubular and spirally internally threaded curling device, the rotating and reciprocating balling mandrel, ball stripper and means to feed the fibers thereto, said balling mandrel arranged to traverse the curling device substantially as described.

Signed at Newark, in the county of Essex and State of New Jersey, this 20th day of June, A. D. 1894.

SAMUEL A. FLOWER.
WM. S. RHOADES.

Witnesses:
W. J. MORGAN,
D. F. O'MALLEY.