(No Model.)

H. HARWOOD.

MACHINE FOR WINDING BALLS.

No. 397,362. Patented Feb. 5, 1889.

Fig. 1.

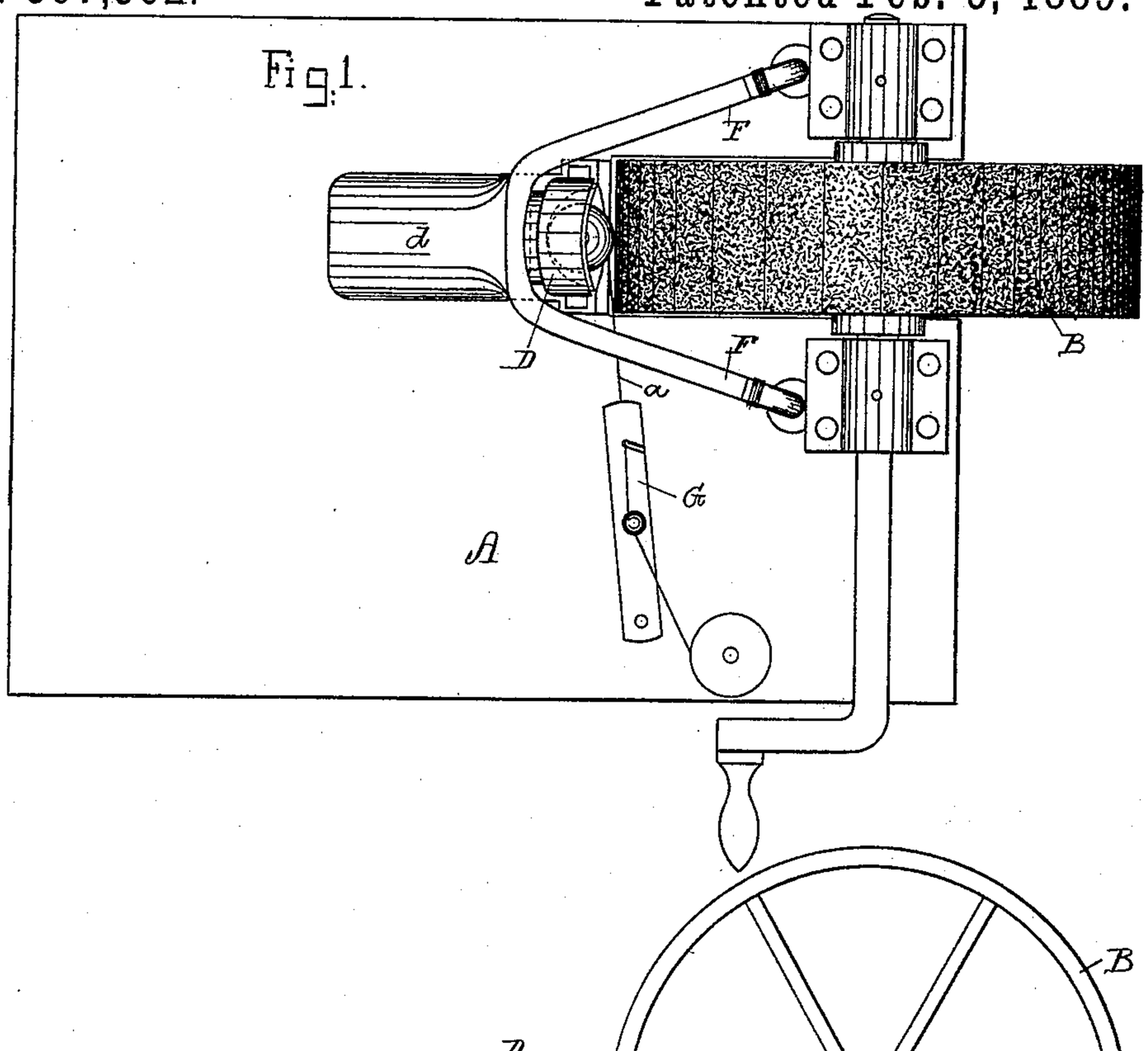
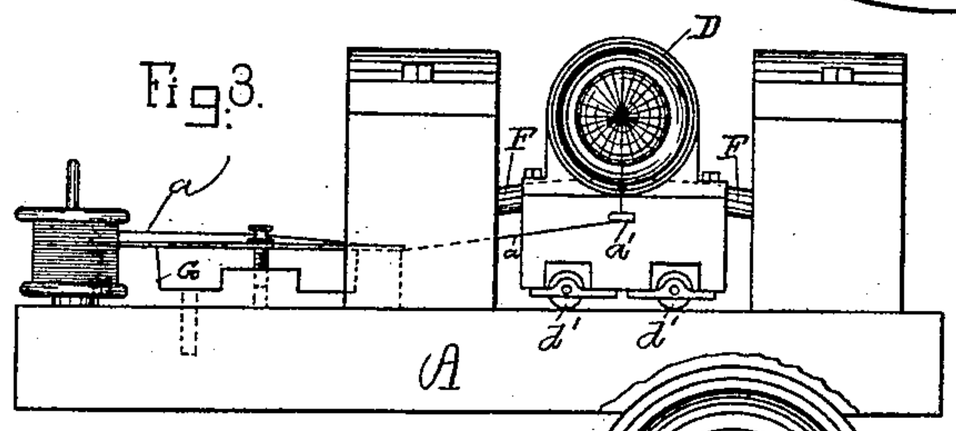


Fig. 2.

Fig. 3.

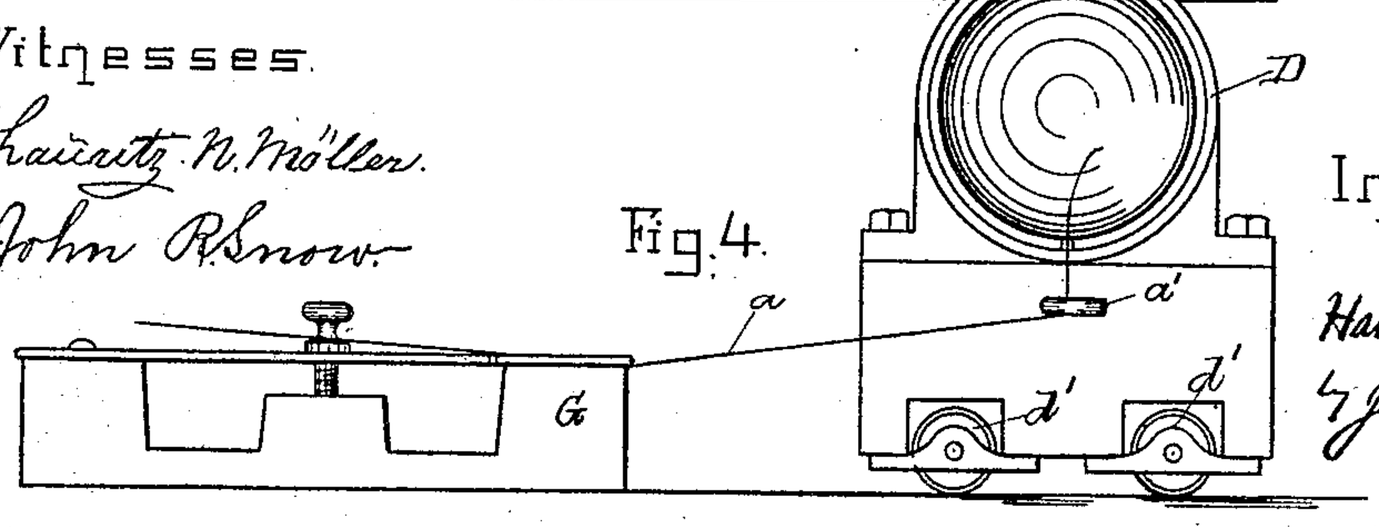


Witnesses.

Lauritz N. Möller.

John R. Snow.

Fig. 4.



Inventor.

Harrison Harwood

by J. E. Maynadier

atty.

UNITED STATES PATENT OFFICE.

HARRISON HARWOOD, OF NATICK, MASSACHUSETTS.

MACHINE FOR WINDING BALLS.

SPECIFICATION forming part of Letters Patent No. 397,362, dated February 5, 1889.

Application filed March 2, 1885. Serial No. 157,583. (No model.)

To all whom it may concern:

Be it known that I, HARRISON HARWOOD, of Natick, in the county of Middlesex and State of Massachusetts, have invented an Improved Machine for Winding Balls, of which the following is a specification, reference being had to the accompanying drawings, in which—

Figure 1 is a plan of my improved machine. Fig. 2 is a side elevation of the same. Fig. 3 is an elevation looking at right angles with the direction of Fig. 2, and with the wheel omitted. Fig. 4 is a front view on a large scale of the cup and its holder and the twine-guiding device.

My invention consists in the combination of a wheel having a roughened surface with a gage-cup having a spherical interior for holding the ball during the winding operation, as more fully explained below and specifically pointed out in the claim.

In the drawings, A represents a suitable bench or table; B, the wheel whose roughened periphery revolves the ball in the cup, and D the cup or ball-holder.

F is a spring, preferably a stout cord of elastic rubber, by which the cup D is forced toward the wheel B, and G is a tension-regulating device to give the proper tension to the yarn or the like used to form the ball.

To operate the machine the nucleus or core of the ball, which is of rubber in some balls, but which is often a small ball to be made larger, is placed in the cup D, after one end of the yarn *a* is secured to it by a few turns or otherwise, the cup having been drawn back against the force of the spring F for that purpose. The cup is then drawn forward by the spring F, so as to hold the nucleus or core between the inner surface of the cup D and the periphery of wheel B, so that when wheel B is revolved the nucleus will be caused to revolve within the cup D. As the yarn *a* is under tension and passes to the nucleus from the eye *a'*, it will be clear that the cup D and wheel B must change their relative positions in order to change the axis of rotation of the ball or core in the cup. This is best done by hand, the cup-holder *d* being provided with rollers *d'* to lessen the friction. It will be obvious that either the cup or the wheel may be moved by mechanism; but on the whole I prefer to move the cup by hand, as the skill soon acquired by the workman produces such good results as to make any mechanism now known to me for reciprocating the cup practically undesirable.

By making the interior of cup D spherical instead of conical I accomplish two results: First, the friction of the ball upon the inner surface of the cup is much less, and, secondly, the cup acts as a gage for the size of the ball, for when the ball gets to the required size it will fill the cup and bind in it.

In practice I use cups of two or more sizes. The first size receives the core proper—such as a small ball of rubber—and on this core the yarn or the like is wound until the cup is filled. Then a second sized cup is used, the ball made in the smaller cup being used as a core in the next larger size.

I am aware that Benjamin B. Newell shows a ball-winding machine of this class in his application, Serial No. 67,935, filed July 29, 1882; but my cup differs radically from the cup shown in his drawings in being spherical instead of conical, whereby my cup acts as a gage for the size of the ball, as above explained. I disclaim all that is shown in Newell's application; and

I claim as my invention—

In a ball-winding machine, a ball-winding wheel, B, and cup D, having a spherical interior, arranged and operating substantially as set forth.

HARRISON HARWOOD.

Witnesses:
W. A. COPELAND,
JOHN R. SNOW.