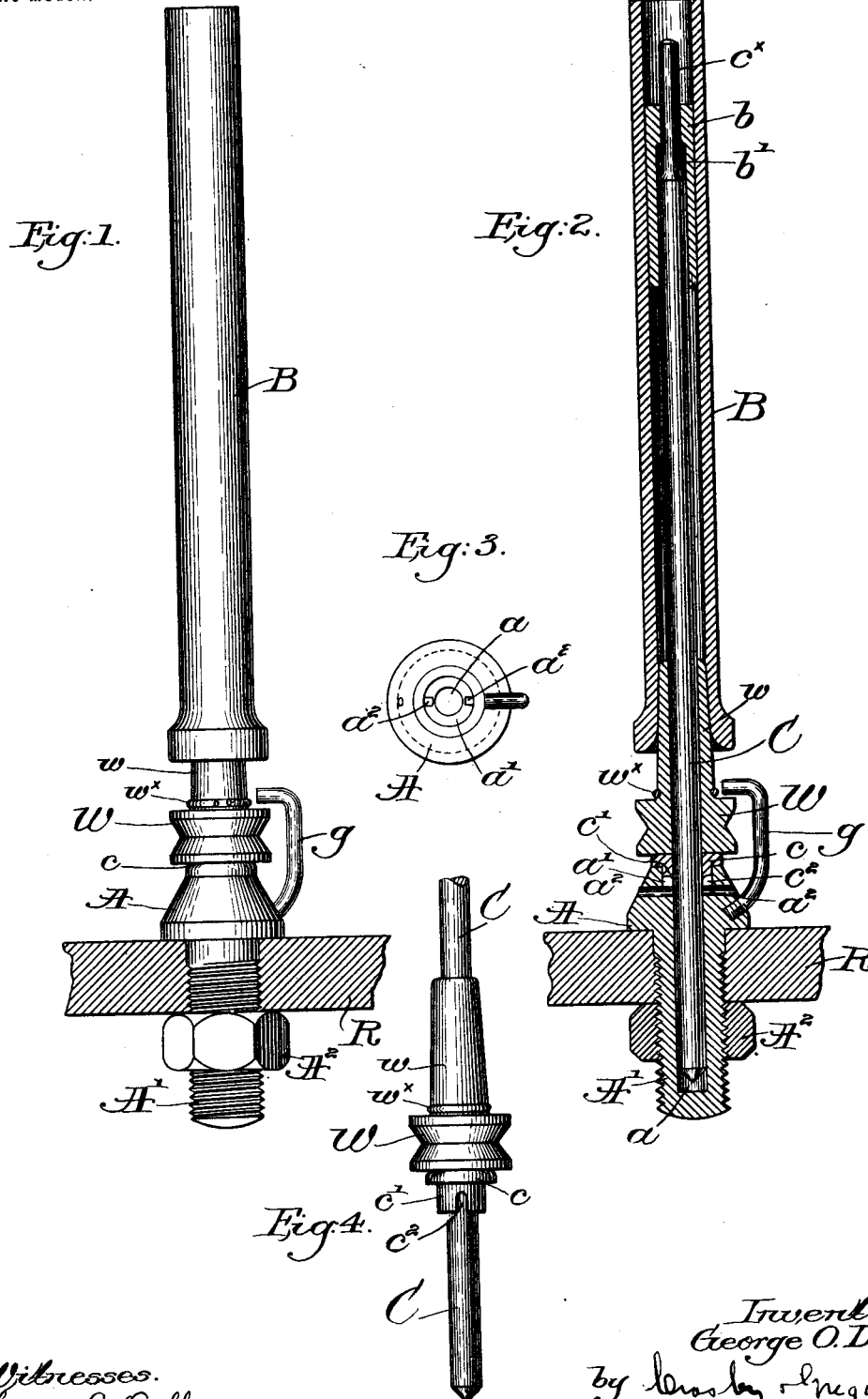


No. 676,087.

Patented June 11, 1901.

G. O. DRAPER.  
SPINNING APPARATUS.  
(Application filed July 17, 1899.)

(No Model.)



Witnesses.  
George L. Dolbeare.  
Gustave F. Maguire.

Inventor.  
George O. Draper.  
by Wesley Gregory,  
Attys.

# UNITED STATES PATENT OFFICE.

GEORGE O. DRAPER, OF HOPEDALE, MASSACHUSETTS, ASSIGNOR TO DRAPER COMPANY, OF SAME PLACE AND PORTLAND, MAINE.

## SPINNING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 676,087, dated June 11, 1901.

Application filed July 17, 1899. Serial No. 724,052. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE O. DRAPER, of Hopedale, county of Worcester, and State of Massachusetts, have invented an Improvement in Spinning Apparatus, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

In modern spinning apparatus a rotating spindle is employed to effect rotation of the yarn-carrier or bobbin, the spindle receiving the rotary motion, and thus imparting it to the yarn-carrier, the two being held in frictional engagement. Heretofore the spindle or revolving shaft has been considered a necessary feature and the only important modification is that known as the "dead-spindle" type, in which an upright stationary member is utilized to carry or form an axial support for a revolving shell on which the bobbin or yarn-carrier is placed. In the course of my experiments to simplify the construction and reduce the cost of spinning with due regard to efficiency I have been led to the conclusion that the yarn-carrier itself should be directly rotated on bearings, thereby eliminating the intermediate rotatable shell heretofore necessary in the one case or the spindle itself in the other case. I have practically embodied my invention in a number of different forms, one of which is herein shown, the device comprising an upright non-rotatable support, a yarn-carrier or bobbin provided with a bearing, and a whirl to rotate on the upright support, the yarn-carrier and whirl being treated with some suitable antifriction compound.

The serious practical difficulty with all former dead-spindle devices has been the rapid wear of the parts and the difficulty of lubrication. For some obscure reason and which I am unable to explain a shell revolving on a dead-support will wear more rapidly than will a shaft revolving in a bearing, even if the size and the material are the same in both instances. With my novel construction of apparatus, however, the question of wear is immaterial, as the bobbins or yarn-carriers used are cheap and are liable to destruction by other causes long before the period of bear-

ing wear will affect their utility. The preferably wooden whirl I use is also so cheap and simple in construction that its replacement is a matter of little moment.

The lubrication of a shell revolving on an upright shaft or support is a very difficult mechanical problem when using liquid lubricant, as the oil or other lubricant will escape at either end of the shell. I have found that by the use of non-metallic bearings, preferably wood treated with hot wax, the bearings will retain enough of the lubricant to outlast in efficiency the usual period of wear with such devices.

Inasmuch as such of the parts of my spinning device as are metallic are much simpler in form than those of the usual metal spindle devices and inasmuch as there is no necessity for the fine workmanship required with the former devices, I am enabled to manufacture the entire structure for a small fraction of the usual cost.

Figure 1 in side elevation represents spinning apparatus embodying one form of my invention, the sustaining-rail being shown in section. Fig. 2 is a longitudinal diametral section thereof, the axial support being partly in elevation. Fig. 3 is a top or plan view of the spindle stand or base which in practice is rigidly secured in place on the rail, and Fig. 4 is a side elevation of the lower portion of the spindle or upright support with the whirl in place.

Referring to Figs. 1 and 2, a stand or base A, having a hollow threaded shank A' to extend through the usual rail R and receive a retaining-nut A<sup>2</sup>, is counterbored at the upper end of the hole a in the shank, as at a', Fig. 2, and I have herein shown two pins or lugs a<sup>2</sup> extended inward from the upper end of the base A.

A metallic axial support for the yarn-carrier or bobbin B (shown as a dead-spindle C) has rigidly secured to it near its lower end a collar c, provided with a downturned shank c', having notches c<sup>2</sup>, Fig. 4, to be entered by the stops or lugs a<sup>2</sup> when the spindle is in place and held in an upright position in the base to hold the spindle from rotation, the collar c at such times resting on the upper end of the base A. At its upper end the

spindle is reduced in diameter at  $c^x$ , Fig. 2, to enter a bearing formed by a bushing  $b$  within the yarn-carrier B, said bushing being enlarged in its bore at  $b'$  to loosely fit the larger portion of the spindle below and adjacent the tip  $c^x$ . This bearing embraces the support or spindle C with a running fit, the non-metallic bearing being impregnated with suitable antifriction compound—as, for instance, by boiling it in wax.

A wooden or other non-metallic whirl W, having a tapering extended hub  $w$ , is applied to the spindle above the collar  $c$  and has a running fit thereon, a metallic ring  $w^x$  being applied to a shallow groove in the hub to reinforce the same, the whirl and its hub being also impregnated with antifriction compound. The bottom of the whirl rests upon the smooth top of the collar  $c$ , and the tapered hub enters the lower end of the yarn-carrier, engaging the same by frictional contact, so that the whirl and yarn-carrier will be rotated in unison by the hand-driving device of usual construction. (Not shown.) The yarn-carrier is thus provided with bearings at its upper and lower ends for the dead-spindle C, and it can be run at very high speed without the vibration which a rotatable spindle would show at the same speed.

A guard  $g$ , mounted in the spindle-base A, overhangs the whirl and prevents its removal when the apparatus is in operation and when the yarn-carrier is doffed.

When it is desired to remove the spindle

from the base, the guard is turned to one side, releasing the whirl, and the spindle can be lifted from the base.

My invention is not restricted to the precise construction and arrangement shown and described, as the same may be varied in different particulars without departing from the spirit and scope of my invention.

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

1. In a device of the class described, a spindle-base, a spindle provided with a collar and loosely mounted in the base, a projection on the one engaging a notch in the other, to prevent rotation of the spindle, and a rotatable yarn-carrier applied to the spindle, the collar on the latter serving to maintain the yarn-carrier in proper vertical position.

2. In a device of the class described, a spindle-base, a spindle mounted therein, a collar fast on the spindle, means to engage the collar and prevent rotation of the spindle, a whirl rotatable on the spindle and normally resting on the collar, and means to retain the whirl in place on the spindle.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GEORGE O. DRAPER.

Witnesses:

JOHN C. EDWARDS,  
AUGUSTA E. DEAN.