

(No Model.)

W. A. DELMAGE.

SPINDLE STEP FOR SPINNING MACHINES.

No. 263,688.

Patented Sept. 5, 1882.

Fig. 1

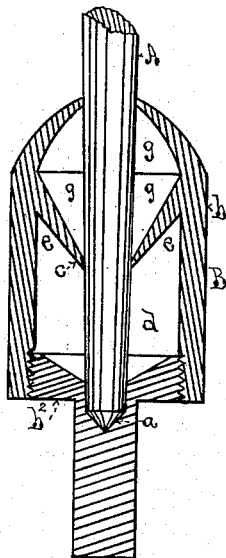
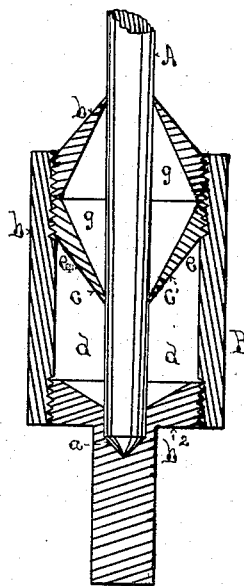


Fig. 2



Witnesses

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SPINDLE-STEP FOR SPINNING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 263,688, dated September 5, 1882.

Application filed July 21, 1881. (No model.)

To all whom it may concern:

Be it known that I, WM. A. DELMAGE, of the city of Lowell, county of Middlesex, and State of Massachusetts, have invented a new and useful Spindle-Step, of which the following is a specification.

My invention relates to steps for spindles of spinning-machines; and its objects are to provide a step for such spindles which will prevent the waste of oil therefrom, and which will remain lubricated for a great length of time after being once oiled, one of simple construction, and one that will prevent the floating fibers of cotton in the air about the spindle from reaching the oil used to lubricate the spindle in the step. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 shows a vertical central section of the step with the spindle in position in elevation; Fig. 2, a like step in which the several parts are slightly modified in form and manner of union with one another.

A is the lower part of a spindle such as is ordinarily used in spinning-machines, having the conical foot *a*.

B is the step, composed of the case *b*, base *b*², and diaphragm *c*. The case *b* is joined to the base *b*² and carried up a considerable distance above the base perpendicularly, when its walls are drawn in toward the spindle, forming a conical or rounded top whose edges terminate close to the spindle when in operative position, so that the only opening into the case through which either air or other substances can enter is the opening down through which the spindle passes. The diaphragm *c* is placed at some distance above the base-plate *b*² and given a considerable inclination downward from the circumference where joined to the case to the central opening in it, through which the spindle passes. There is therefore formed above the level of the point where the spindle enters the oil-chamber *d* a recess, *e*, into which the oil will be received when from any cause it is driven up the sides of the case.

Within the case, above the oil-chamber and separated from it by the diaphragm, is the dead-air chamber *g*. This chamber has no openings through which air can escape or enter except those through which the spindle passes,

and as those are made of but little greater diameter than the spindle the passage of fibers of cotton unaided by a current of air passing through the openings is almost, if not entirely, prevented.

The top of the case and diaphragm can be made removable from the other parts, as shown in Fig. 2, if such construction is preferred; but as no fibers of cotton are found to pass into the dead-air chamber such separable construction is not necessary.

The operation of my device may be thus described: When oil is supplied to the oil-chamber by turning oil into it through the opening through which the spindle passes, and the spindle put in rotation at its usual rapid rate, which is in such spindles from five to seven thousand revolutions per minute, the oil is thrown away from the spindle by centrifugal force imparted to it by contact therewith and will be piled up against the sides of the case, and by the constant and continued action of the spindle upon the oil or air in contact with it the oil will be forced up the sides of the case, and as it rises to escape such action of the spindle it will be forced up into the recess, where it remains so long as such influences are operative. The same, being unable to escape, flows back whenever the spindle is stopped.

The downward inclination of the diaphragm forms above the level of the opening through which the spindle enters the oil-chamber a chamber or recess opening into the oil-chamber, protected from the direct action of any substance given an outward tangential movement by the spindle, and the oil, when driven up into the oil-recess *e*, will be acted upon only by the pressure of the air caused by the centrifugal force given the air below it by contact with the spindle, and the lifting force of the film of oil constantly endeavoring to flow to the base of the spindle down the sides of the oil-chamber, which film has its lower part acted upon by the spindle to constantly drive it back up the sides of the chamber. As the recess has no opening at its top, there will be no waste of oil by any overflow of the oil-chamber, no matter what speed may be given to the spindle. As the oil-chamber has no opening other than that through which the spindle enters,

the escape of the air, owing to the centrifugal force imparted to it by the rapid rotation of the spindle and the consequent creation of an inrushing current at the opening nearest to the axis of the spindle carrying fibers of cotton with it, is prevented, and therefore the accumulation of a quantity of such fibers and their winding about the spindle is also prevented.

As a further guard against the accumulation of fibers of waste or flying cotton about the spindle near the part lubricated, and the consequent absorption of the oil, I provide the dead-air chamber placed above the oil-chamber, and which, like the latter, has no opening near its circumference through which air can escape. There will therefore be no draft of air through the openings into such air-chamber, and the fibers of cotton falling upon the top of the step will be very little likely to enter the dead-air chamber, especially as the top is made conical or rounded and the opening into the chamber is narrow and annular in form.

The oil-recess *e* may be formed in a flat diaphragm by making an annular groove of sufficient depth and capacity in it near its circumference; but I prefer the centrally-downward-inclined diaphragm as more effective and cheaper.

In the spindle-steps heretofore constructed with an oil-chamber surrounding the foot of the spindle over which a cap or cover is loosely placed the oil was either thrown out of the oil-cup by the movement of the spindle or absorbed by the accumulated fibers of cotton which the draft of air created by the spindle deposited upon or around it. With the loose cap the centrifugal motion given to the air within the cap by the spindle caused a current of air outward through the opening between

the step and cap and an inrushing current through the opening between the cap and spindle, which current tends to draw into the cap any dirt or fibers of cotton floating in the air, when it or they are likely to be deposited upon or about the spindle, which, near its foot, is coated with oil, and therefore is in a condition for such substances to adhere to it. There is therefore, in steps of this construction, constantly brought into contact with the spindle near its foot a fresh portion of air which constantly deposits its impurities, or a large portion of them, upon or about the spindle, only to be superseded by other portions to add more impurities.

In my device it will be observed that excepting the small portion of air entering the oil and dead-air chambers, when the rotation of the spindle is first begun, necessary to the increased density in those chambers of the air caused by the centrifugal motion given it by the spindle, no air passes out of or into either the dead-air or oil chamber, and the dead-air chamber being on top of the oil-chamber removes the point of contact of the spindle and fibers of cotton floating in the air about the dead-air chamber so far from the point of lubrication that the spindle is there free from oil and no way inclined to lap up and wind about itself such fibers.

What I claim as new and of my invention is—

The combination of the oil-chamber *d*, diaphragm *e*, and dead-air chamber *g*, as and for the purpose substantially as set forth.

WM. A. DELMAGE.

Witnesses:

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