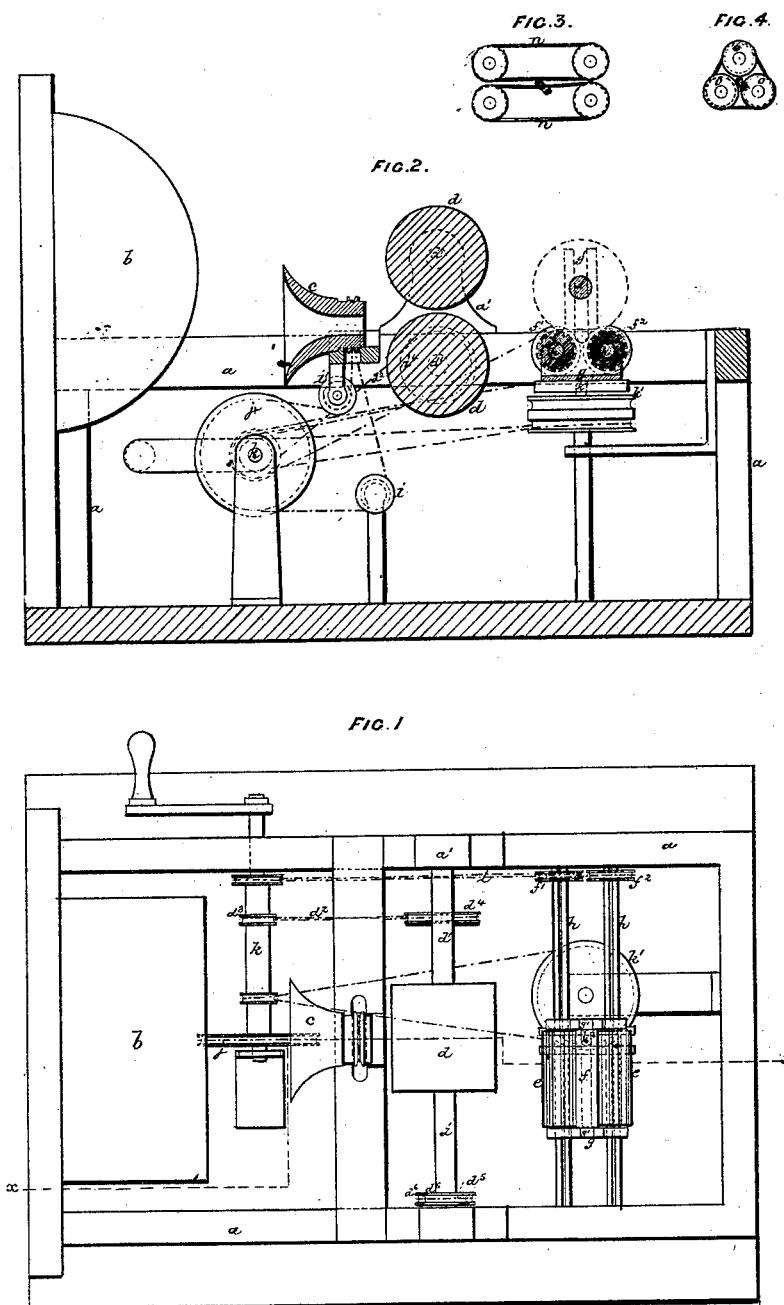


S. G. ARCHIBALD.
MACHINE FOR BALLING OAKUM.

No. 113,831.

Patented Apr. 18, 1871.



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SAMUEL GEORGE ARCHIBALD, OF EDINBURGH, NORTH BRITAIN.

Letters Patent No. 113,831, dated April 18, 1871.

IMPROVEMENT IN MACHINES FOR BALLING OAKUM.

The Schedule referred to in these Letters Patent and making part of the same.

I, SAMUEL GEORGE ARCHIBALD, of the city of Edinburgh, North Britain, have invented "Improved Machinery for Twisting and Balling Oakum," of which the following is a specification.

My invention relates to mechanism by which oakum that has been properly opened and carded out is twisted into a strand and finally wound into a ball.

I prefer to arrange my improved mechanism in combination with a machine in which the fibers accumulated on a roller or "doffer" are taken off by the action of what is known as a doffing-knife, or by other suitable means.

According to my invention, as the fibers are detached from the doffer they are gathered together and at the same time twisted into a strand by a revolving funnel or other devices hereinafter described, through which they are drawn by drawing-off rollers, the strand being then wound upon a revolving and traversing spindle or bobbin, as hereinafter described, and formed into a ball.

The upper roller of each pair of the aforesaid drawing-off rollers is made of such weight that the strand in passing through them will be flattened and compressed, in which form it both makes more compact balls and is more readily used for calking ships and other similar work.

Description of the Accompanying Drawing.

Figure 1 is a plan of my improved mechanism, showing the same arranged in connection with the doffer of a carding-machine.

Figure 2 is a longitudinal section of the same on the line *xx* of fig. 1.

Figures 3 and 4 show the devices used as substitutes for the revolving funnel above mentioned.

The parts of my improved mechanism are supported upon suitable framing *a*, which may form part of or be attached to any ordinary carding-machine.

b is the roller or doffer of such a machine.

c is the revolving funnel, which may be made of iron, brass, or other suitable metal.

d d are the drawing-off rollers, fixed on the shafts *d'*, which are fitted to turn freely in the bearings *a'* in the frame *a*, the upper and lower rollers being geared together, and the upper one being free to rise and fall in a vertical line.

The balling device consists of the fluted rollers *e*, the spindle *f*, and sliding carriage *g*, which carries the said rollers and spindle, and which slides on the shafts *h* that are secured in the frame *a*.

By the action of the drawing-off rollers *d* the fibers, as fast as they are liberated from the doffer *b* by a doffing-knife or other similar apparatus, are drawn through the revolving funnel *c*, by the rotation of which they are formed into a strand.

The said funnel is driven by tapes or bands running over the guide-rollers *i* from the pulley *j* on the shaft *k*, or in any other convenient manner. I sometimes make the outlet of the funnel of an oval shape.

The strands thus formed pass between the drawing-rollers to the revolving spindle *f*, upon which they are wound so as to form a ball.

The action of the balling mechanism is as follows:

The spindle *f*, which is free to work up and down in the guide-ways *g'* of the carriage *g*, is supported upon the fluted rollers *e*, which will revolve in the same direction and impart to the spindle a rotative movement. As the ball increases in size the spindle rises in the ways *g'*, the surface of the ball still resting on the fluted rollers. When the ball has attained the required size by the continuous working of the machine it is removed, and a new spindle inserted in its place whereon to form a new ball.

To allow a ball of any desired width to be formed the spindle *f* and rollers *e* are made to travel up and fro by the action of the crank *k'*, with which they are connected, the crank-pin *k''* being made adjustable so that its distance from the center of the plate may be increased or diminished, thereby to vary the width of the ball.

It will be observed that the shafts *h* have a longitudinal guide-way to receive a key or feather from the rollers *e*, so that the rollers may slide freely endwise on the said shafts, while they are compelled always to rotate with them.

The rollers *d* are shown as driven from the shaft *k* by a strap or belt, *d''*, passing over the pulleys *d''* *d'*, the shafts *d'* being connected, so that the rollers work properly together, by the cross-belt *d'''* passing over the rollers *d''*.

I have also shown a belt, *l*, passing over pulleys *f'* and *f''* for rotating the shafts *h*; it is obvious, however, that spur-gearing or other means of communicating the required motion to these various parts may be used.

In place of the revolving funnel, belts, sheets, or aprons may be used, as shown in fig. 3.

The oakum sliver would in this case pass between the two sheets *n*, which may be of leather or other suitable material, and which revolve in opposite directions.

I may also use three rollers, *o*, fig. 4, revolving in the same direction, and so placed round the sliver that it would be acted upon by them, all the rollers being kept in contact by springs or by the weight of the upper roller.

I have described the twisting and balling processes as taking place in conjunction with the carding-machine; but the balling apparatus may be used separately, the sliver of oakum coming from the doffer of

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a carding-machine being gathered into a can or otherwise collected, and afterward subjected to the twisting and balling apparatus described; or the sliver of oakum produced by the card may be pressed by the rollers and balled without being twisted by using fixed conductors in the place of the revolving funnels; or a sliver of oakum produced by any other means may be twisted and balled, or balled only, by my improved mechanism.

Claims.

I claim as my invention—

1. The balling apparatus, consisting of the sliding

carriage, the two revolving shafts, the two fluted rollers, and the loose spindle, combined and operating together substantially as set forth.

2. A machine for twisting and balling oakum, consisting of the funnel or the twisting-rollers or aprons, the drawing-rollers, and the balling apparatus, combined and operating together substantially as set forth.

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