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F. W. CHADDERTON.

MACHINE FOR COMBING COTTON, WOOL, &c.

APPLICATION FILED FEB. 25, 1902.

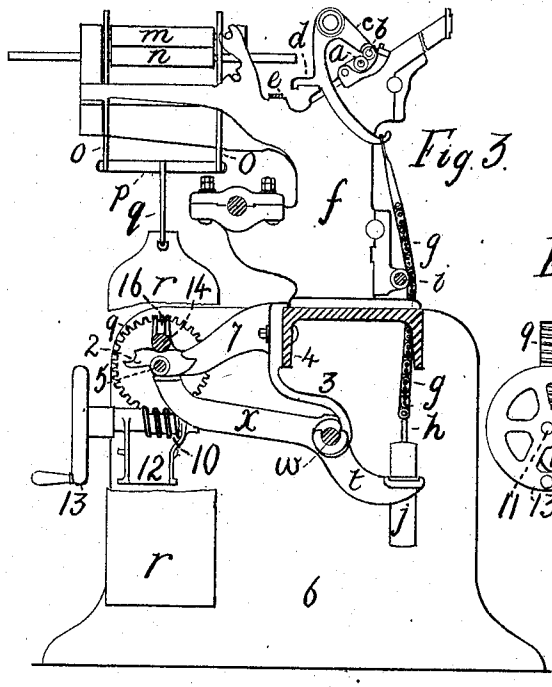

Fig. 3.

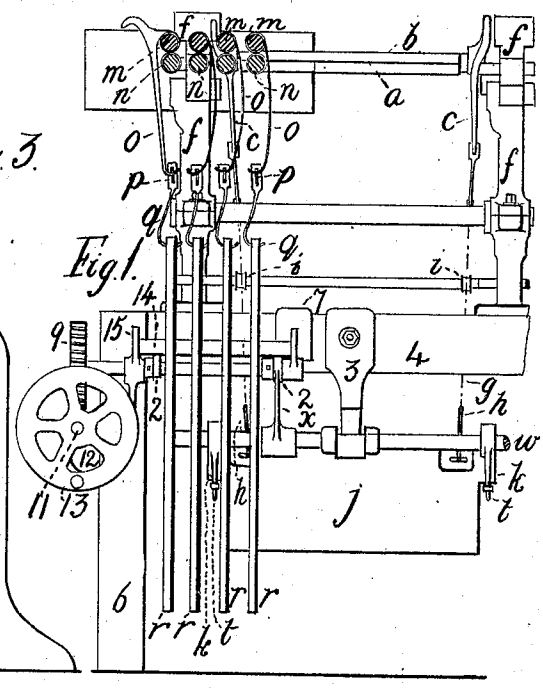

Fig. 1.

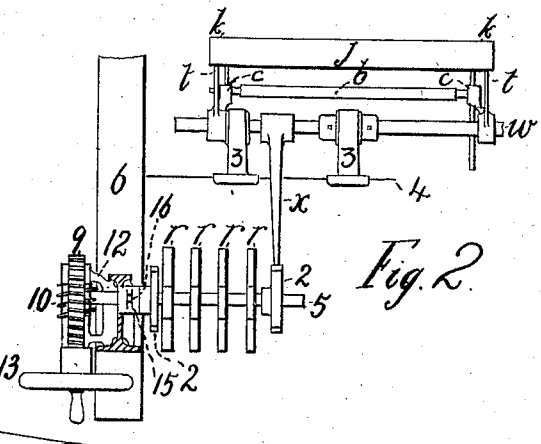

Fig. 2.

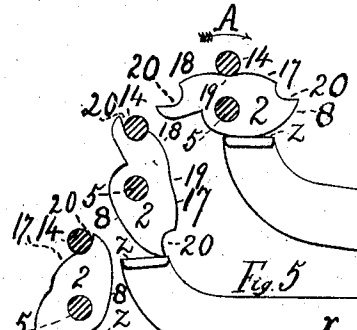

Fig. 4.

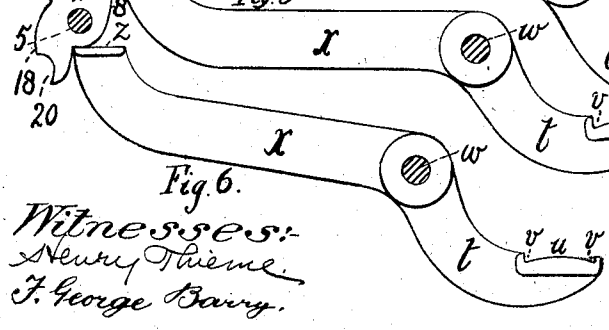

Fig. 5

Fig. 6.

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UNITED STATES PATENT OFFICE.

FRANK WAUGH CHADDERTON, OF OLDHAM, ENGLAND.

MACHINE FOR COMBING COTTON, WOOL, &c.

No. 823,844. Specification of Letters Patent. Patented June 19, 1906.

Application filed February 25, 1902. Serial No. 95,517.

To all whom it may concern:

Be it known that I, FRANK WAUGH CHADDERTON, foreman, a subject of the King of the United Kingdom of Great Britain and Ireland, and a resident of 42 Penn street, Oldham, in the county of Lancaster, in the Kingdom of England, have invented certain new and useful Improvements in Combing-Machines for Combing Cotton, Wool, and other Fibrous Materials, of which the following is a specification.

This invention of improvements in combing-machines for combing cotton, wool, and other fibrous materials consists in the application to such machines of mechanism to relieve the operatives attending to such machines of the labor hitherto involved in unweighting or relieving the detaching-rollers and the rollers of the draw-boxes used in such machines of the pressure of the weights used therewith, as is necessary in order that the covered top rollers may not be injured by the weights being left hanging on the rollers when such machines are not working, as during the stoppage of mills in which such machines are employed. If the weights are left hanging on the rollers when the machines are not working, the pressure on the top rollers tends to form flat places on them at the parts which rest on the bottom rollers used with such top rollers.

According to this invention I provide for each roller, whether it be a roller of the draw-box or a detaching-roller which may be required to be relived from time to time of the pressure of the weight or weights used therewith, a device moved by a cam or cams to engage with the weight or weights used with such roller, so that such weight or weights may be raised and supported with little labor on the part of the attendant in charge of the combing-machine and supported when raised for as long as may be desirable, and I arrange the said device so that it may be operated easily and conveniently by the attendant in charge of the machine in which it is employed.

I have illustrated and described in the accompanying drawings and the description following one form of mechanism by way of example of the various arrangements which may be employed according to this invention.

In the accompanying drawings, Figure 1 is a front elevation, partly in longitudinal vertical section, of so much of a combing-machine as is requisite for the illustration of the form of this invention, which is shown in the accompanying drawings by way of example. Fig 2 is a plan of the said portion of the said combing-machine with some parts omitted to obviate confusion. Fig. 3 is a transverse vertical section showing the said portion of the combing-machine as seen from the right hand of Figs. 1 and 2 and partly broken to show parts which would otherwise be hidden. Figs. 4, 5, and 6 are elevations, partly transverse sections, taken on a plane parallel to that of Fig. 3 and showing on a larger scale than Fig. 3 and in three different positions one of the cams used according to this invention in the form illustrated by way of example in the accompanying drawings and the arm acted upon by the said cam and certain other parts used with such cam.

In the drawings, *a*, Figs. 1 and 3, is the bottom detaching-roller, which extends, as usual, through the several heads of the machine, the portion shown being that which is farthest from the place at which such detaching-roller receives motion and is supported and moved by the usual means, which being well known to persons conversant with combing-machines is not described in this specification. The bottom detaching-roller *a* is omitted from Fig. 2 to obviate confusion. The bottom detaching-roller *a* is arranged to act in the ordinary may in conjunction with the usual leather-covered top detaching-rollers *b*, which are mounted and operated in the ordinary manner. Only one of the top detaching-rollers *b* is shown in the drawings. Hooks *c* of the ordinary form, of which two only are shown in the drawings, are arranged to bear in the ordinary way upon the necks of the top detaching-rollers *b*, and these hooks *c* are respectively provided in the ordinary way with projections *d*, by which when removed from the top detaching-rollers *b* they may be made to rest upon projecting supports *e*, provided to receive them on the brackets *f*, supporting some of the mechanism used with the said portion of the top detaching-roller *a*.

Connecting devices of any suitable kind *g*, which in the case illustrated are chains I, connected to the hooks *c* and provided with hooks *h* and guided by means of pulleys *i*, are provided to transmit to the top detaching-rollers *b* the pressure of the weights *j* used therewith, of which weights only one is shown in the drawings. As will be herein-

after mentioned, each weight *j* is provided with an ear or projection *k* at each end for the purpose of this invention as embodied in the arrangement illustrated. A similar weight similarly supported is provided for each top detaching-roller *b*.

m m are the top rollers of the draw-box, which are mounted and arranged to act in conjunction with bottom rollers *n* in the ordinary way. In conjunction with each of the top rollers *m* there are provided two hooks *o* of the ordinary kind connected to a cross-bar *p*, to which is connected a hook *q*, supporting the weight *r* used with such top rollers *m*, there being in each combing-machine three or more weights *r*, each serving to exert pressure on one of the three or more top rollers *m* employed therein. In the case illustrated there are four top rollers *m*, and consequently four weights *r*. For the purposes of this invention as embodied in the arrangement illustrated each of the weights *r* is provided with a slot *s*, as will be hereinafter described.

During the working of the machine the weights *j* are supported by the top detaching-rollers *b* with which they are respectively used, and the weights *r* are supported by the top drawing-rollers *m* with which they are respectively used, and apart from the inevitable wear to which they are subject the leather coverings of the top detaching-rollers *b* and the top rollers *m* of the draw-box receive no injury from the pressure to which they are subject. If, however, the machine be stopped, and especially if it be stopped for a lengthened period while the weights *j r* remain supported by the rollers *b m* with which they are respectively used, the leather coverings are injured by hollows or flat places being formed in them at the parts at which they are pressed upon the metal rollers used therewith. Hitherto to relieve the top detaching-rollers *b* and the top rollers *m* of the pressure of the weights *j r* respectively used therewith has been an inconvenient and laborious operation, which by reason of being inconvenient and laborious has been often neglected by the attendants in charge of combing-machines to the detriment of the leather-covered rollers *b m* and the work done by such machines. According to this invention I provide devices which, being moved into and held in a suitable position, act upon the weights which it may be desired to put out of action from time to time and support the weight thereof and prevent them from continuing to exert pressure upon the rollers with which they are respectively used. In the arrangement illustrated by way of example in the accompanying drawings means are provided by which at times both the weights *j* used with the top detaching-rollers *b* and the weights *r* used with the top drawing-rollers *m* can be relieved and by which at other times only the weights *r* used with the top drawing-rollers *m* may be relieved or put out of action on the rollers used with them. In the said arrangement arms or levers *t* are provided to engage with the weights *j* used with the top detaching-rollers *b*, there being two arms or levers *t* for each weight *j*. As shown, the weights *j* are provided with projections *k* for the arms or levers *t* to engage with, and, as is clearly shown in Figs. 4, 5, and 6, the arms *t* are provided with rounded bearing-surfaces *u*, bounded at each end by substantially vertical surfaces *v*, so as to be furnished with seats to receive the said projections *k*. In the arrangement illustrated in the drawings the said arms *t* are shown as secured upon a shaft *w*, fast upon which is an arm *x*, provided with a bearing-surface *z* to be acted upon by a cam 2. As shown, the said shaft *w* is mounted in brackets 3, secured to the rail 4, which forms part of the framework of the machine. The cam 2, as shown, is secured upon a shaft 5, capable of being turned in bearings formed one in a bracket 15, secured to the end frame 6 of the machine, and the other in a bracket 7, secured to the rail 4, and is formed with a surface 8, which when such cam 2 is turned in the direction indicated by the arrow A from the position in which it is indicated in Figs. 3 and 4 to the position in which it is indicated in Fig. 5 acts upon the bearing-surface *z* of the arm *x* and depressing it raises the arms *t*, so that the bearing-surfaces *u* thereof act upon the projections *k*, formed on the weights *j*, used with the top detaching-rollers *b*, and raise and support such weights *j*, so as to relieve such top detaching-rollers *b* from the pressure of the wieghts *j*. When the cam 2 is turned in the direction opposite to that indicated by the arrow A from the position in which it is indicated in Fig. 5, the arms *t* cease to support the weights *j*, so that such weights *j* are again allowed to exert pressure upon the top detaching-rollers *b*.

The surface 8 of the cam 2 is so formed that when the said cam 2 is turned in the direction opposite to that indicated by the arrow A, from the position in which it is shown in Figs. 3 and 4 to the position in which it is shown in Fig. 6, the arm *x* will not be depressed and the weights *j* will not be raised.

The shaft 5 in the arrangement illustrated is adapted to be turned by means of a worm-wheel 9, secured upon it, and a worm 10, secured upon a shaft 11, which is capable of being revolved in bearings formed in a bracket 12, secured to the end frame 6 of the machine, and is provided with a hand-wheel 13, so that it may be conveniently turned. For convenience the shaft 5 is made to pass through the slots *s* of the weights *r*.

The description already given herein describes the mechanism used in the arrangement illustrated in the drawings for relieving

the top detaching-rollers *b* of the pressure of the weights *j*, and if it be considered desirable the parts already described may be employed for the said purpose without the use of the other mechanism, which in the arrangement illustrated is provided in order that the top drawing-rollers *m* may be relieved of the pressure of the weights *r* used therewith and which I will now proceed to describe.

As has been mentioned already herein, each weight *r* is for the purpose of this invention provided with a slot *s*. The slots *s* besides serving for the passage of the shaft 5 serve to receive a rod 14, which being arranged to be raised and lowered serves in the arrangement illustrated as the device for raising and supporting the weights *r*, so as to relieve the top rollers *m* of the draw-box of the pressure exerted thereby in the ordinary working of the machine. The said rod 14 may be arranged to be raised for the said purpose either about one end or as a whole, as shown, and in any suitable way, as by means of arms like the levers *t*, or by means of a cam or cams, or by other means, but as shown is arranged to be raised as a whole by means of two cams 2. One of these cams 2 has already been described in part, and the other is similar, but is not arranged to act upon an arm *x*.

The rod 14, as shown, is arranged to be supported during the ordinary working of the machine by means of the brackets 7 and 15, which are provided with openings 16, which receive the rod 14 and guide it when it is moved upward and downward. The rod 14 is formed at its ends with necks to enter such openings 16.

Each of the cams, as shown, though not necessarily, is provided with two surfaces 17 18 to act upon the rod 14 and raise it when the said cams 2 are turned in either direction from the positions in which they are indicated in Figs. 3 and 4. In the positions in which they are indicated in Figs. 3 and 4 the cams 2 present their parts 19 which are of least radius to the rod 14, thereby allowing the weights *r* to hang free of such rod 14. In being turned in either direction from the position in which they are shown in Figs. 3 and 4 the cams 2 raise the said rod 14 by means of their surfaces 17 or their surfaces 18, according to the direction in which they may be turned, and by raising the said rod 14 bring it against the upper ends of the slots *s* in the weights *r* and cause it to act upon the said weights *r* and raise them, so as to relieve the top drawing-rollers *m* of the pressure ordinarily exerted thereon by the said weights *r*. At the end of each surface 17 or 18 which is most remote from the part 19 of the cam 2 on which it is formed there is formed a hollow 20. The hollows 20, receiving the rod 14 when the cams 2 are turned in either direction to the extent necessary to raise the weights acted upon, serve to hold the said weights in a raised position and make such rod 14 hold the cams 2 in position to keep the said weights so raised.

Each cam 2 is provided with the two surfaces 17 18 to act on the rod 14, so that by the cams 2 being turned in the direction indicated by the arrow A, Fig. 4, into the position shown in Fig. 5 both the top detaching-rollers *b* and the top drawing-rollers *m* may be relieved of the pressure of the weights *j* and *r*, respectively, used therewith, while by the cams 2 being turned in the direction opposite to that indicated by the arrow A, Fig. 4, into the position shown in Fig. 6 the top drawing-rollers *m* may be relieved of the pressure of the weights *r*, while the top detaching-rollers *b* remain subject to the pressure of the weights *j* used therewith, as is desirable in order that the draw-box rollers may be accessible for the removal of "roller-laps" or other purposes without interference with the grip of the detaching-rollers and the other parts with which they coöperate in the combing of the fibrous material being operated upon. By the hand-wheel 13 being turned in one direction or the other the operations of relieving either the rollers *m* of the draw-box alone or the rollers *m* of the draw-box and the top detaching-rollers *b* of the pressure of the weights used therewith and also of again reapplying pressure to such rollers can be easily and conveniently accomplished, and these operations being made easy and convenient the damage to the rollers hitherto due to the neglect of the attendants to relieve such rollers of pressure is obviated.

What I claim, and desire to secure by Letters Patent, is—

1. In a combined combing-machine and drawing-frame, the combination with the top detaching-rollers, weights supported thereby and exerting pressure thereon during the working of the machine, the top rollers of the draw-box, weights supported thereby and exerting pressure thereon during the working of the machine and means whereby the weights supported by the top detaching-rollers during the working of the machine may be raised and supported when the machine is stopped, of a device arranged to engage with the said top drawing-roller weights and raise and support them, a cam to move the said device, a worm-wheel connected to the said cam, a worm engaging with such worm-wheel and means to turn such worm.

2. In a combined combing-machine and drawing-frame, the combination with the top detaching-rollers, weights supported thereby and exerting pressure thereon during the working of the machine, the top rollers of the draw-box, weights supported thereby and exerting pressure thereon during the working of the machine and means whereby the weights supported by the top detaching-rollers dur-

ing the working of the machine may be raised and supported when the machine is stopped, of a rod arranged to engage with the said top drawing-roller weights and raise and support them, cams to act on the said rod and means to turn such cams and simultaneously raise both sets of weights.

3. In a combined combing-machine and drawing-frame, the combination with the top detaching-rollers, weights supported thereby and exerting pressure thereon during the working of the machine, the top rollers of the draw-box and weights supported thereby and exerting pressure thereon during the working of the machine and means whereby the weights supported by the top detaching-rollers during the working of the machine may be raised and supported when the machine is stopped, of a rod arranged to engage with the said top drawing-roller weights and raise and support them, cams to act on the said rod, a worm-wheel connected to the said cams, a worm engaging with the said worm-wheel and means to turn the said worm and simultaneously raise both sets of weights.

4. In a combined combing-machine and drawing-frame, the combination with the top detaching-rollers, weights supported thereby and exerting pressure thereon during the working of the machine, the top rollers of the draw-box, weights supported thereby and exerting pressure thereon during the working of the machine and means whereby the weights supported by the top detaching-rollers during the working of the machine may be raised and supported when the machine is stopped, of a rod arranged to engage with the said top drawing-roller weights and raise and support them, cams each with two surfaces to act on the said rod and means to turn such cams.

5. In a combined combing-machine and drawing-frame, the combination with the top detaching-rollers, weights supported thereby and exerting pressure thereon during the working of the machine, the top rollers of the draw-box, weights supported thereby and exerting pressure thereon during the working of the machine and means whereby the weights supported by the top detaching-rollers during the working of the machine may be raised and supported when the machine is stopped, of a rod arranged to engage with the said top drawing-roller weights and raise and support them, cams each with two surfaces to act on the said rod, a worm-wheel connected to the said cams, a worm engaging with the said worm-wheel and means to turn the said worm.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 15th day of February, 1902.

FRANK WAUGH CHADDERTON.

Witnesses:
HOWARD CHEETHAM,
ELDON ALFRED KING.