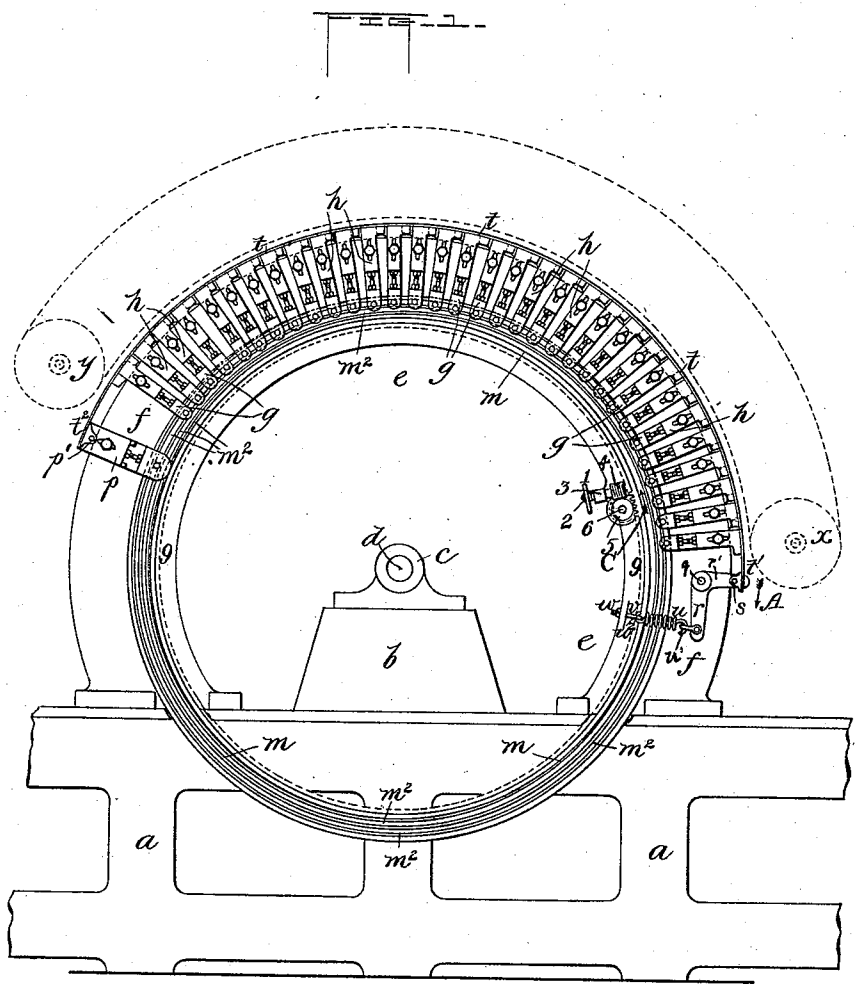
(No Model.) 2 Sheets—Sheet 1.

T. S. WHITWORTH.

CARDING ENGINE.

No. 468,855. Patented Feb. 16, 1892.



WITNESSES

W. B. Barlow

Herbert R Abbey

INVENTOR

Thomas S. Whitworth

(No Model.) 2 Sheets—Sheet 2.

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FIG. 2.

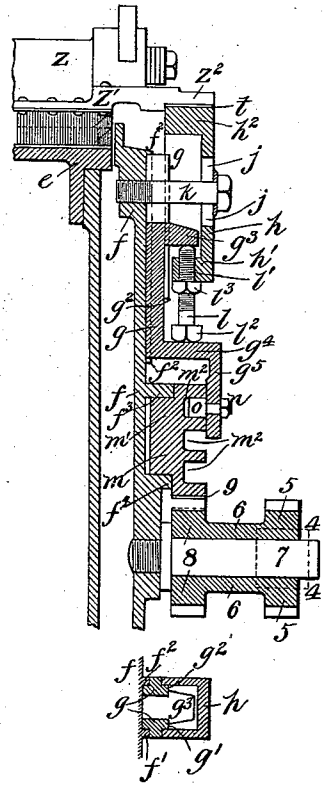


FIG. 3.

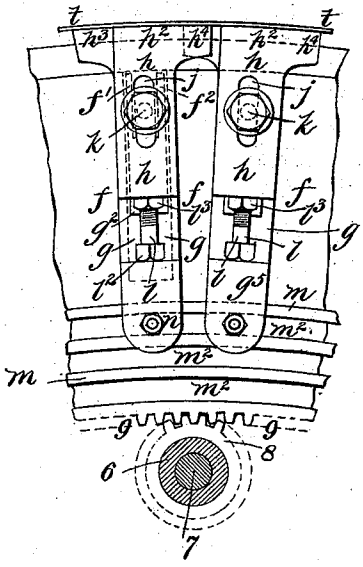
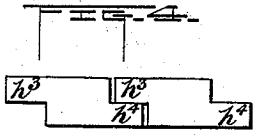


FIG. 4.



WITNESSES

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UNITED STATES PATENT OFFICE.

THOMAS S. WHITWORTH, OF MANCHESTER, ENGLAND, ASSIGNOR TO THE LOWELL MACHINE SHOP, OF LOWELL, MASSACHUSETTS.

CARDING-ENGINE.

SPECIFICATION forming part of Letters Patent No. 468,855, dated February 16, 1892.

Application filed July 10, 1891. Serial No. 399,056. (No model.) Patented in England February 19, 1884, No. 3,556.

To all whom it may concern:

Be it known that I, THOMAS SCHOFIELD WHITWORTH, of Manchester, in the county of Lancaster, England, have invented certain new and useful Improvements in Carding-Engines for Carding Cotton, Wool, and other Fibrous Materials, (for which I have procured Letters Patent in Great Britain, No. 3,556, dated February 19, 1884,) of which the following is a specification.

My invention relates to carding-engines having traveling flats and used for carding cotton, wool, and other fibrous materials, and in particular to that part of a carding-engine which is used in conjunction with the traveling flats for sustaining and guiding the flats in proper working position as they pass around part of the circumference of the main cylinder; and my invention consists in an improved construction and combination of parts whereby I am enabled to alter the curvature of the supports for the traveling flats, so as to cause it to correspond with the varying diameter of the main cylinder of the carding-engine, such varying diameter being caused by the grinding or sharpening of the cards upon such main cylinder.

My invention will first be described in connection with the accompanying drawings, and will then be particularly defined in the claims at the close of this specification.

One method of carrying my invention into effect is illustrated by the drawings hereunto annexed.

Figure 1 is a side elevation of so much of a carding-engine as is required to illustrate my invention; and Figs. 2, 3, and 4 are detached views of portions thereof upon a larger scale, Figs. 2 and 3 being partly in section.

Similar letters and numerals of reference are applied to corresponding parts throughout the whole series of figures.

At *a* is the main side framing of the carding-engine, which, by means of the bracket *b* and pedestal *c*, supports the axle *d* of the main cylinder *e* of the carding-engine. Secured to and carried by the frame *a* is the circular bend *f*. Upon the bend *f* are formed a number of radial ribs f' f^2, which act as guides to a series of brackets *g*. Upon each of the brackets *g* are formed ribs g' g^2, which act as guides to a bracket *h*, which can at times, as will hereinafter be described, be slid longitudinally upon the bracket *g*. Passing through a slot *j*, formed through each of the brackets *h*, is a screw *k*, the threads of which screw *k* take into the corresponding screw-threads formed in the bend *f*. The brackets *g h* are rigidly secured in place upon the bend *f* by means of the screw *k*. The end h' of each of the brackets *h* is provided with an adjusting-screw *l*, the threads of which screw *l* take into corresponding threads formed in the bracket *h*. The end l' of the screw *l* abuts against the projecting part g^3, formed upon the corresponding bracket *g*, and the remaining end l^2 of the screw *l* abuts against the projecting part g^4, also formed upon the said bracket *g*. The upper end h^2 of the bracket *h* I form curved, so that the curvature thereof corresponds to that of the top of the cards upon the main cylinder *e* of the carding-engine.

The brackets *g h* combined form a compound radial bracket, the curved upper end of which serves for the support and guidance of the traveling flats. A series of the compound brackets is placed around the upper portion of the circumference of the main cylinder, the said brackets being arranged in close proximity to one another around said portion of the circumference of the main cylinder.

Upon the outer surface of the bend *f* are formed circular ribs f^3 f^4, the center of the circle which is described by each of such ribs f^3 f^4 being coincident with the center of revolution of the main cylinder *e* of the carding-engine. Supported upon the circular ribs f^3 f^4 is a ring *m*, provided with a circular projecting rib m', which is situated between the ribs f^3 f^4. Formed in the ring *m* is a spiral groove m^2, and formed upon each bracket *g* is an extended portion g^5, to which, by means of a nut *n*, is secured a stud *o*, which projects into the spiral groove m^2, formed within the ring *m*. The ring *m*, with its spiral groove, constitutes a cam with an acting surface which is common to all of the compound brackets *g h*, such acting surface extending unbrokenly or continuously past the series of brackets. For the purpose of turn-

ing the ring m, in order to effect the desired adjustment of the compound brackets, the upper ends of which support and guide the flats while the latter are traveling in working position around the upper portion of the circumference of the main cylinder, I provide a hand-wheel 1, mounted fast upon a shaft 2, supported by a bracket 3, secured to the bend f. Fast upon the shaft 2 is a worm 4, gearing into the teeth of the worm-wheel 5, fast upon the tubular collar 6, mounted upon a stud 7, carried by the bend f. Fast upon the tubular collar 6 is a toothed wheel 8, the teeth of which gear into the teeth of the circular rack 9, formed upon the inner side of the ring m. As the ring m is rotated in the direction of the arrow C, Fig. 1, the spiral groove m^2, acting upon the studs o, will operate positively to draw the whole series of the compound brackets simultaneously toward the axis of the main cylinder. If the ring m is turned in the direction opposite to that of the arrow C, the brackets will be moved away from the axis of the main cylinder e.

At x y are indicated the wheels or pulleys ordinarily employed for traversing the flats z around the main cylinder e. Each of the flats z is provided at its end z' with a projecting part z^2, which while the said flat z is passing over the main cylinder e rests upon the supports, by which it is sustained and guided into proper working position.

For the purpose of bridging the space which would exist between two adjacent compound brackets at their upper ends I form the ends h^2 of the brackets h with projecting parts h^3 h^4, these parts on each bracket overlapping those on the adjacent brackets, as shown most clearly in Figs. 3 and 4. In order that the ends h^2 of the brackets h may be of a curve corresponding to or nearly corresponding to that of the surfaces of the cards upon the main cylinder e, I propose in some cases to turn or grind the said ends after the brackets h have been placed in position and secured by the screws k. The parts z^2 of the flats z may rest upon and travel over the upper ends of the bracket h. However, if preferred, after the ends of the brackets h have been ground or turned a band or strip t, of steel or other suitable metal, may be placed over the ends h^2 of the series of brackets h, and the ends of the flats will travel over and along these strips. In the drawings I have shown such a strip t applied and held in position. The band or strip t after being applied may, if requisite or desired, be turned or ground. In Fig. 1 of the drawings the end t^2 of the band or strip t is secured to a pin p', projecting from a bracket p, applied to the bend f and corresponding in all essential features of construction and in its connection with the ring m with one of the compound brackets g h. The other end t' of the band or strip t is connected with a stud s upon one end r' of a bell-crank lever r, mounted upon a stud q, secured to the bend f. To the other arm of the bell-crank lever is attached one end u' of a coiled spring u, the other end u^2 of which coiled spring u is secured by means of the rod v and nut w to the bend f. The spring u tends to turn the bell-crank lever r in the direction of the arrow A in Fig. 1 and draws and keeps the band or strip t in contact with the ends h^2 of the brackets h.

I have shown in the drawings and have described herein only the devices which are applied to one side of a carding-engine; but it will readily be understood that in practice the devices which I have shown and which are herein described will be duplicated upon the side of the carding-engine which is opposite to the side now shown.

When the card-clothing upon the main cylinder e and upon the flats z becomes ground away, so that it is desirable to permit the flats to come nearer to the axis of the main cylinder, in order to bring the card-clothing upon the flats into proper proximity to that upon the main cylinder the screws k of the compound brackets are slackened and the ring m is turned by means of the devices described in the direction of the arrow C. When the flats z have been adjusted to the position desired, the screws k are again tightened, so as to secure the brackets g h rigidly to the bend f. If it be desired to remove the card-surfaces of the flats z farther from the card-surface of the main cylinder e, the ring m may be turned in the direction which is the reverse of the arrow C. As the compound brackets g h are moved toward the axis of the main cylinder, the spring u will cause the band or strip t to be kept in contact with the outer ends h^2 of the brackets h, and the spring will yield to the outward movement of the said brackets. The ring m when turned in either direction effects radial adjustment of the flat-supporting compound brackets simultaneously at the various points of the travel of the flats around the circumference of the main cylinder.

When it is desired to vary the length of any particular compound bracket, so that the flats in passing over the end h^2 of such bracket will be nearer to or farther from the axis of the main cylinder, it is simply necessary after slackening the screw k and the lock-nut l^3, pertaining to the said compound bracket, to turn the screw l, whereby the bracket h will be moved longitudinally upon the bracket g farther from or nearer to the axis of the main cylinder e, according as the screw l is turned in one direction or the other, and after the bracket h has been adjusted into the desired position upon the bracket g the lock-nut l^3 and screw k will be tightened again.

Instead of employing a spiral groove m^2 in the ring m, engaging projections or studs upon the brackets g, I may form the ring m with a spiral rib and the brackets g with grooves, into which the said rib will enter.

Having now particularly described and ascertained the nature of my invention and the manner of reducing the same to practice, I claim as my invention—

1. The combination, with the main cylinder and traveling flats of a traveling-flat carding-engine, of flat-supports and a spirally-formed cam having a continuous cam-surface and adapted to effect radial adjustment of the flat-supports simultaneously at the various points of the travel of the flats around the circumference of the cylinder, substantially as described.

2. The combination, with the main cylinder and traveling flats of a traveling-flat carding-engine, of a series of radial brackets or arms and a plate having a continuous spirally-formed groove or rib in engagement with all of the brackets or arms of the series and operating to adjust them radially simultaneously, substantially as described.

3. The combination, with the main cylinder and traveling flats of a traveling-flat carding-engine, of a series of flat-supports arranged in close proximity to one another around a portion of the circumference of the main cylinder and having their upper surfaces curved, the said flat-supports having lateral overlapping portions, whereby the continuity of the bearing-surface on which the flats move is preserved in all positions of adjustment, and means for adjusting the flat-supports radially, substantially as described.

4. The combination, with the main cylinder and traveling flats of a traveling-flat carding-engine, of a series of radial brackets arranged in close proximity to one another around a portion of the circumference of the main cylinder and having their upper surfaces curved, and means for effecting positively simultaneous adjustment inward or outward of the series of brackets, substantially as described.

5. The combination, with the main cylinder and traveling flats of a traveling-flat carding-engine, of movable flat-supports, means for adjusting the same at all points along radii of the main cylinder, and a ribbon of metal lying upon the said flat-supports and interposed between the same and the flats, substantially as described.

6. The combination, with the main cylinder and traveling flats of a traveling-flat carding-engine, of the radially-movable brackets, the ring *m*, provided with a spiral groove or rib, which is engaged by said brackets, and the flexible ribbon *t*, resting on said brackets, substantially as described.

7. The combination, with the main cylinder and traveling flats of a traveling-flat carding-engine, of movable flat-supports, means for adjusting them along radii of the main cylinder, a ribbon of metal lying upon the said flat-supports and interposed between the same and the flats, and a spring for straining the ribbon and holding it pressed against the flat-supports, substantially as described.

8. The combination of the radially-movable compound bracket composed of two members *g h*, the latter of which is movable upon the former, and the adjusting-screw *l*, with an adjusting-cam, whereby the compound bracket is adjusted radially, substantially as described.

In testimony whereof I have hereunto set my hand, in presence of two witnesses, this 8th day of June, 1891.

THOMAS S. WHITWORTH.

Witnesses:
H. B. BARLOW,
HERBERT R. ABBEY.