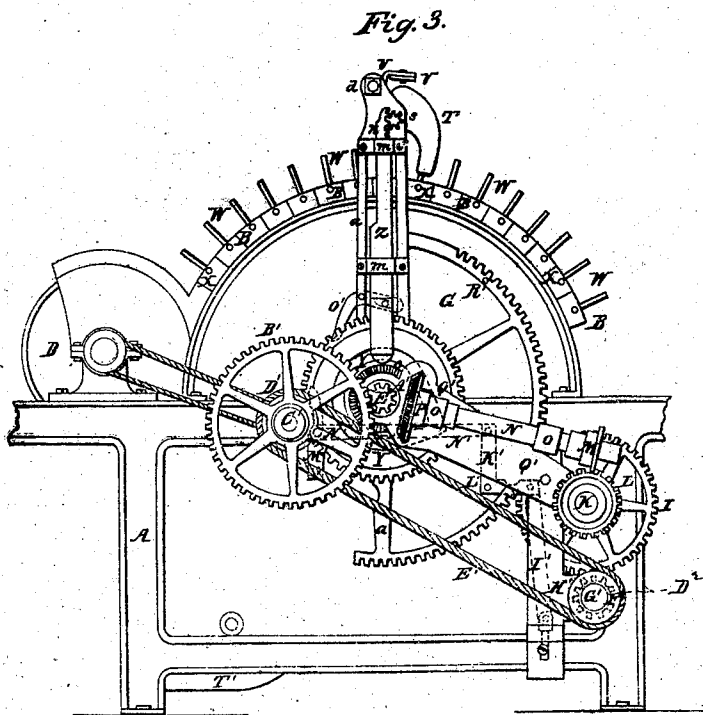
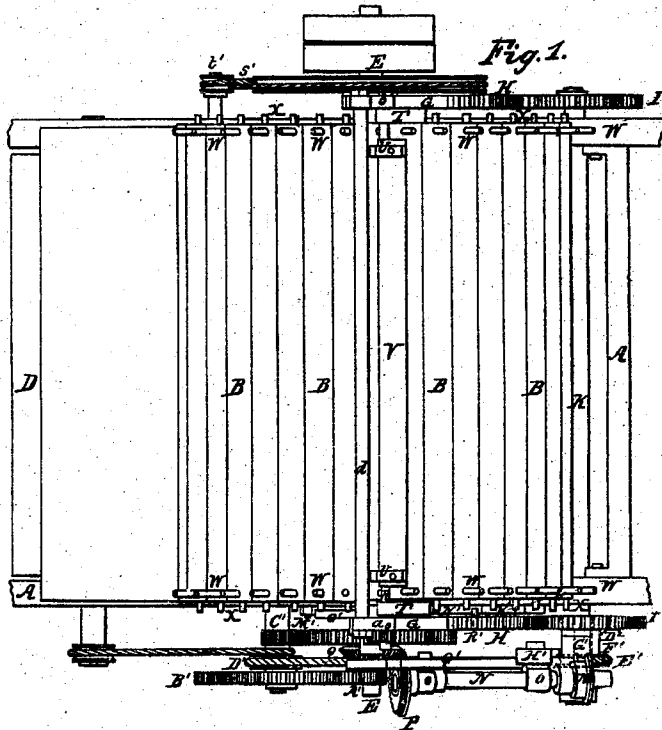


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Machine for Cleaning the Cards of Carding Engines

N^o 11,448.

Patented Aug. 1, 1854.



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Fig. 4.

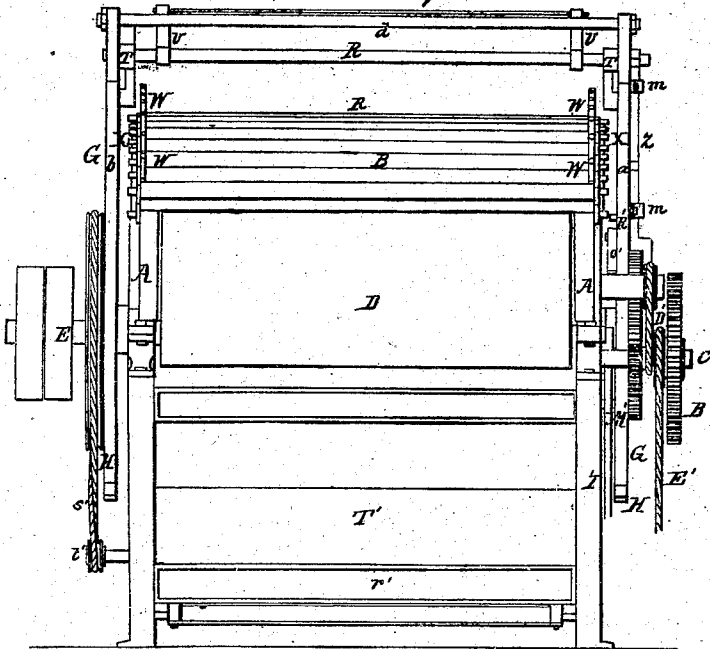


Fig. 12.



Fig. 2.

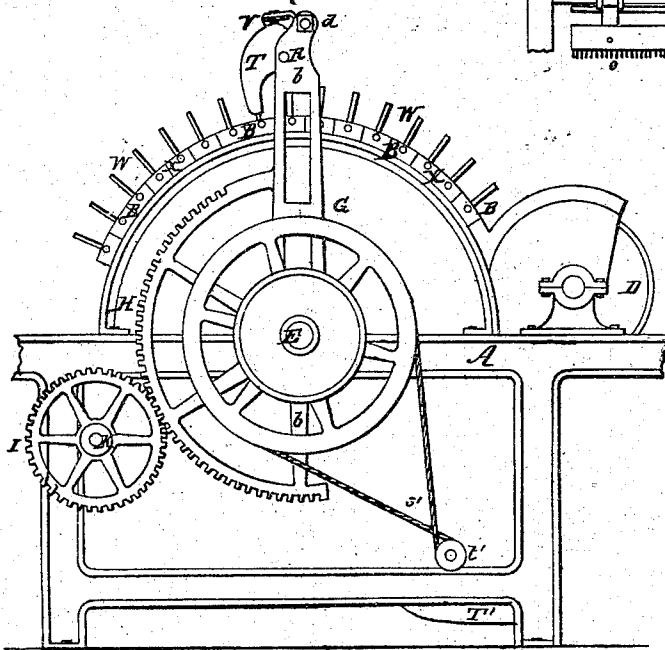
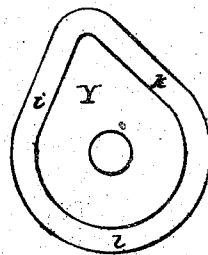


Fig. 11.



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Fig. 6.

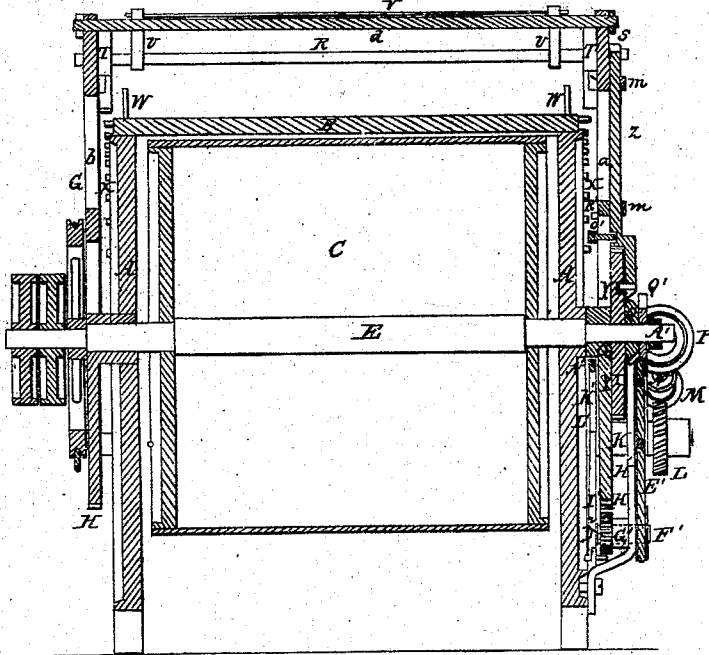


Fig. 8.

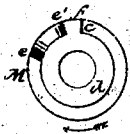


Fig. 7.

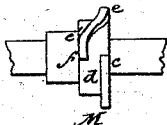


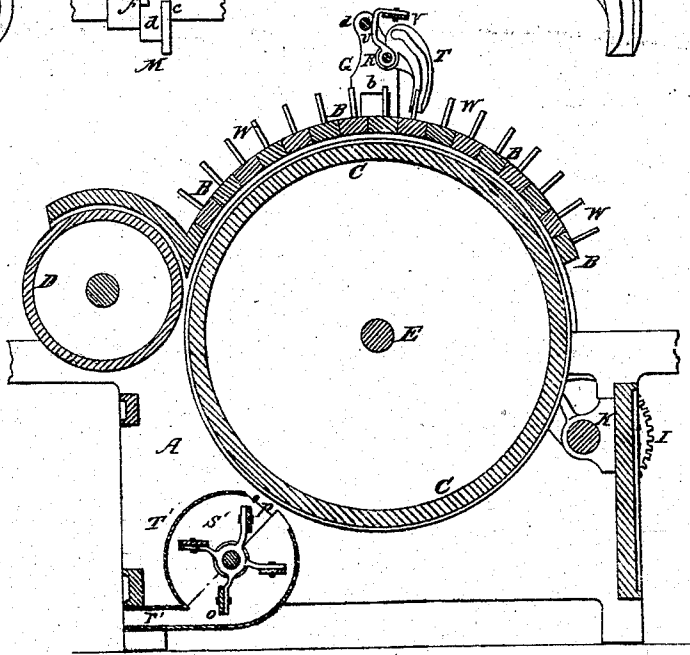
Fig. 5.



Fig. 9.



Fig. 10.



UNITED STATES PATENT OFFICE.

HORACE WOODMAN, OF BIDDEFORD, MAINE.

CLEANSING CARDS OF CARDING-ENGINES.

Specification of Letters Patent No. 11,448, dated August 1, 1854.

To all whom it may concern:

Be it known that I, HORACE WOODMAN, of Biddeford, in the county of York and State of Maine, have invented Improved Machinery to be Applied to a Carding-Engine for the Purpose of Cleansing Its Cards; and I do hereby declare that the same is fully described and represented in the following specification and the accompanying drawings, letters, figures, and references thereof.

Of the said drawings Figure 1, denotes a top view of a carding machine provided with my invention. Fig. 2, is an elevation of that end of it termed the driving end or that end to which the driving power is applied. Fig. 3, is an elevation of the opposite end of it. Fig. 4, is a rear elevation of it. Fig. 5, is a vertical, central and transverse section of it. Fig. 6 is a vertical, central and longitudinal section of it.

Such other figures as may be necessary to a full description and delineation of my invention will be hereinafter particularly referred to and described.

In the first place, A represents the main frame of a carding engine, while B, B, B, denote a series of top cards thereof, each of which cards is composed of a bar or lag B having a strip of card teeth or filleting fixed on its under surface in the usual manner.

The main card cylinder is shown at C, and the doffing cylinder at, D, many of the remaining well known working parts of the carding machine not being represented in the drawings, they having no special reference to my invention being such as are in general use.

Until within a very short period it has been customary to cleanse the top cards of a carding engine by manual labor; each at a proper time being removed from its seat and cleansed by a card or instrument held in the hand and operated by a workman or attendant. Recently a mechanism or invention for automatically cleansing the top cards has been applied to a carding machine; its purpose being to effect the elevation of each of the top cards in succession from the bed or frame on which such cards are supported, the cleansing of such top cards and their subsequent return to the bed.

The nature of my invention consists in an improved and greatly simplified mechanism for producing such results. A rocker frame G composed of two frames, *a*, *b*, and a cross

connection bar *d*, is made to extend upward from and turn loosely on the shaft, E, of the main card cylinder, C; the two bars *a*, *b*, being placed out side of the framework as seen in the drawings. A semicircular arc or sector of teeth H, is affixed to each bar *a*, and *b*, and made to engage with a spur gear I, fixed on a shaft K, there being two such gears, II, arranged as seen in the drawings. There is also fixed on said shaft, K, a worm gear, L, which is made to engage with a worm or helix thread, M, carried by an inclined shaft N, that is suitably sustained in bearings, O, O. The thread of the worm, M, is formed more particularly as seen in side view in Fig. 7, and in end view in Fig. 8. From one termination, *e*, of it, such thread extends around the cylinder, *d*, (from which it projects) to a point *e* and in a plane perpendicular to the axis of the cylinder. From the said point, *e*, it branches off in a helix to a point, *e'*, from whence to its termination, *f*, it is parallel to its first part. The first and third parts of the thread of the worm while revolving in the worm gear produce no motion of said gear and hold it firmly in a state of rest, but while the second or helix part of the thread of the worm is working in the gear, it turns said gear and thereby produces rotary motion of the shaft K, and sufficient to move the frame G the distance necessary to enable the lifting machinery of the top cards to operate upon the top card succeeding and any one just previously cleansed. Rotary motion of the shaft N, is produced by two beveled gears P, Q, one of which is placed on the inner end of the shaft, N, while the inner or latter is fixed on the shaft E.

From the above it will be seen that during each revolution of the shaft, N, the frame, G, will be moved a certain distance on the main shaft, E. The said frame, G, carries a shaft, R, which turns freely in the two bars, *a*, *b*, and has a pinion gear, S, fixed upon one end of it and outside of the bar, *a*. The said shaft, R, carries two grooved, lifter cams, T, T, which are formed as seen, in Figs. 9, and 10, which exhibit innerside views of said cams. Beside these cams, the shaft, R, supports by means of two bent arms, U, U, a bar, V, arranged as seen in the drawings, the said bar when in use having a strip of card filleting affixed along its inner surface, and it may be termed the cleansing or brush bar. Each top card B, B,

is supported in the usual way on two pins W, W, extended from the framework and through the top card near its end, and there is projecting from each end of the said top card a small stud, X. When the shaft, R, is turned in one direction so as to carry the lifter cams T, T, toward any two studs of the top card and for the purpose of cleansing said top card the said studs will be received into the grooves of the cams and owing to the eccentricity of these grooves and their peculiar action on the studs the top card will be raised upward from off its seat, and the brush or card bar, V, will be carried underneath and in contact with the filleting of the said top card and made to cleanse it, it being understood that the grooves of the lifter cams T, T, are so formed as to cause the entire under surface of the card filleting to be thoroughly brought into contact with and cleansed by the cleansing bar V. As soon as this has been accomplished the shaft R is rotated in the opposite direction so as not only to move the cleansing bar, V, from underneath the top card, but to depress said top card down upon its seat.

In order to effect the reciprocating rotary motions of the shaft R, I employ a grooved cam Y, and a sliding rack bar, Z, the said grooved cam being formed as seen in side view in Fig. 11, and fixed on the main shaft, E. Into the groove of this cam a round pin projecting from one end of the sliding rack bar Z is made to extend and so that during the rotary motion of the cam a suitable reciprocating rectilinear motion of the sliding bar, Z, may be produced, such being effected during the time that the pin is traveling in the straight parts, *i*, *h*, of the groove of the cam, and which straight parts are arranged at an acute angle with respect to one another and are connected by a semicircular portion, *l*, of a groove, such latter portion of the groove producing no movement of the rack bar, while the pin of said rack bar is traveling in it. This sliding rack bar, Z, slides freely in boxes or bearings, *m*, *m*, (attached to the bar, *a*,) and has a rack of teeth, *n*, which is made to engage with the pinion or gear S of the shaft, R, and so as to produce rotary motion of the said shaft whenever the slide bar, Z, is moved longitudinally.

From the above it will be seen that any top card is raised and depressed by a positive motion, it not being elevated by mechanism and afterward suffered to drop down into its place by the action of gravity; nor is it lowered into its place, but is forced downward by the peculiar action of the upper sides of the grooves of the lifter cams.

By the above described machinery the frame, G, will be successively moved from one lag or top card to another throughout

the series and having performed its office on all of them or lifted and cleansed each one in succession, the frame, G, will be moved backward into a position ready to act again on the first top card, which mechanism I shall shortly proceed to describe.

Although I have calculated my mechanism for operating upon each top card successively, I contemplate constructing it so as to remove or lift up every other one instead of every one in succession during the next time the frame G is moved forward over them.

There is a pinion, A', fixed upon the end of the shaft, E; this pinion plays into a gear B', fixed upon a stationary axle, C', and carrying a grooved pulley, D', the whole being arranged as seen in the drawings. Around the said groove pulley D', and another pulley, F', an endless band H' extends. The said pulley, F', is fixed to a shaft G', (shown in the drawings by dotted lines) which is sustained in a frame H', which is made capable of sliding a short distance either upward or downward and is suspended by means of a link or connecting rod, I', to one arm of a bent lever K', the same being represented in Fig. 3 by dotted lines. The said bent lever turns on a fulcrum L', and is connected with a vertical lever M', by means of a connecting rod N'. As soon as the last top card of the series has been depressed upon its seat, a projection, O', from the frame, G, while said frame is in motion is carried into contact with the upper part of the lever, M', and creates a motion of such lever such as will move the lever, K', so as to cause it to lift upward the sliding frame, H', and carry into gear with the spur, I, a pinion, D², that is fixed upon the shaft G', such gear being kept in rotation by the action of the endless belt, E'; at the same time the worm, M, is lifted out of its worm gear, and this because one of the bearings, O, that supports the shaft N, is attached to the movable frame, H'. The other bearing, O, or that next to the bevel gear, P, of the shaft N, being so applied to its sustaining frame or plate, Q', as to allow such a movement of the shaft, N, as will enable the slide, H', to lift up the shaft sufficiently to throw the worm M out of engagement with the worm gear, L. As soon as the worm is thrown out of engagement the pinion gear, D², enters into gear with the wheel, I, and puts it in rotation so as to create a backward movement of the frame, G. Just previous to such frame reaching the extent of its backward motion, a stud, R', extended from the inner side of the toothed arc, H, is carried into contact with the horizontal arm of the bent lever, K', and depresses said arm so as to move the slide, H', sufficiently not only to throw the pinion D' out of engagement with

the wheel, I, but at the same time move the worm, M, into engagement with the worm gear, L, such worm and worm gear while in operation together serving to produce the forward motion of the frame, G, in the manner hereinbefore specified.

For cleansing the cards, of the main cylinder, I make use of a revolving fan wheel, S', which is placed underneath it, and within a case or shrouding, T'. This fan wheel is made of a length corresponding to the length of the cylinder, and has some of its fans or blades armed or studded on their outer edges with teeth or points, o, o, as seen in Fig. 12, which denotes a side view of the fan. There is an elongated opening or slot p, made in the case, T', so as to allow the points of the fans to come in contact with the card filleting on the main cylinder during the revolution of the fan wheel. The case T' is also provided with a discharging mouth or opening r', placed in front of and below the fan wheel. Rotary motion may be communicated to said fan wheel by means of a crossed endless band, s', made to band on or around a grooved pulley, t', fixed on the shaft of the fan wheel and another grooved pulley fixed upon the shaft E.

By means of the case, T', and the fan wheel, S', arranged therein and applied to the main card cylinder not only is a great current of air produced through the case sufficient to take into the case, T', all the dirt or extraneous fibrous matter re-

moved from the card cylinder, but to blow said extraneous matters out of the case, and thus by the conjoint action of this draft or current of air, and the points or teeth of the fan wheel the main card cylinder may be thoroughly cleansed while the carding machine is in operation.

I do not claim to combine with the top cards, mechanism for raising one or more of them and holding the same upward and afterward depressing the same, back into place; nor do I claim in combination therewith, a mechanism for acting on and cleansing such top card or cards when or while so elevated; nor do I claim in combination with a series of top cards, and mechanism for raising or cleansing a top card and restoring it to its seat, a mechanism for moving the raising and cleansing mechanism in succession from one top card to another, but

What I do claim is,

The combining of lifter cams, T, T, and a brush bar, V, with one rotary shaft, R, so that by the movement of such shaft in the manner specified the operations of raising and depressing a top card and cleansing it may be effected in the manner set forth.

In testimony whereof I have hereunto set my signature this twenty seventh day of February A. D. 1854.

HORACE WOODMAN.

Witnesses:

JOHN SHEPLEY,
JOSEPH F. DEARING.