N H. SPAFFORD.

MACHINE FOR SEPARATING BRISTLES.

No. 52,763. Patented Feb. 20, 1866.

Fig. 1

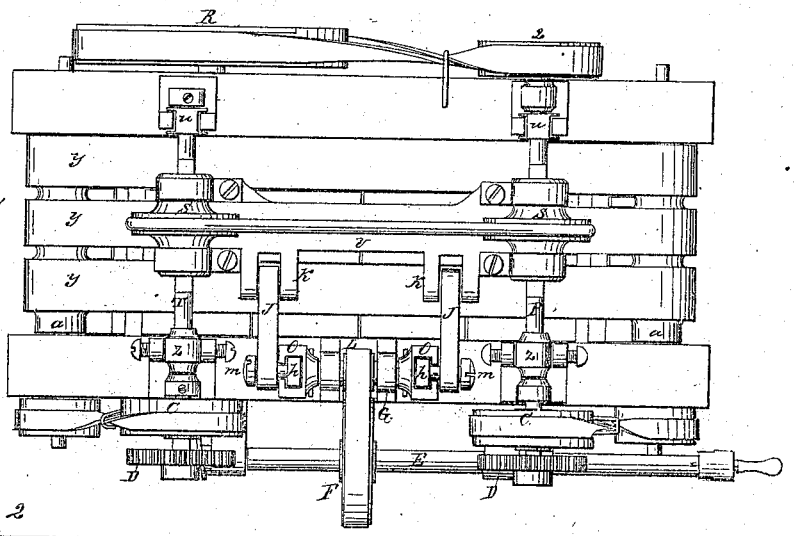


Fig. 2

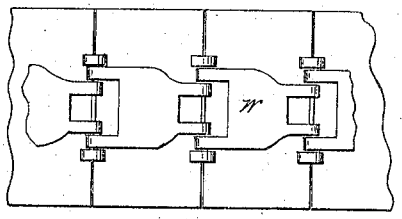


Fig. 3

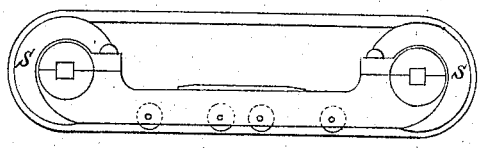
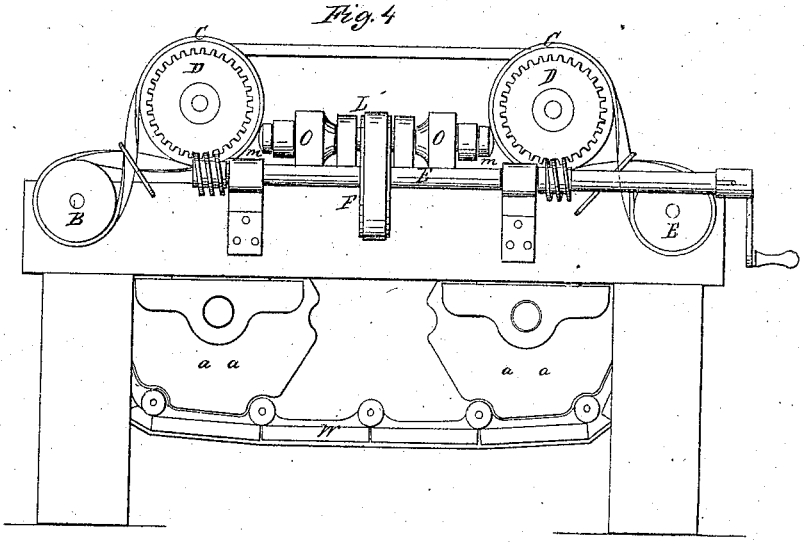


Fig. 4



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NATHAN H. SPAFFORD, OF BALTIMORE, MARYLAND.

IMPROVEMENT IN MACHINES FOR SEPARATING BRISTLES.

Specification forming part of Letters Patent No. **52,763**, dated February 20, 1866.

To all whom it may concern:

Be it known that I, NATHAN H. SPAFFORD, of the city of Baltimore and State of Maryland, have invented a new and useful Improvement in Machinery for Separating Bristles; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of my said improvement, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, the same being and constituting a part of this specification.

It is well known that bristles are coated with small fibrous substances or beards, which are pointed upward from the butts toward the flags or tops thereof.

The nature of my invention consists in providing machinery by which this peculiar conformation of the bristle may be used in separating and adjusting a disordered mass thereof into two separate parcels, the flags of which, severally, shall all point the same way. To this end I construct a frame, as shown on Figure 4 of the drawings, the side beams of which are held firmly together by a central cross-beam. Near each end of said side beams I place rollers. (Marked A A on Fig. 1. The gudgeons of said rollers pass through said side beams, and on the front side thereof I attach the pulleys. (Marked B B on Fig. 4.)

C C are pulleys, over which the same belts pass that move the pulleys B B. D D are cog-wheels, in which the teeth of the worm-gears on the shaft E work.

E is a shaft with worm-gear working in the cog-wheels D D. This shaft has also a pulley, F, around which a belt passes, connecting it with the small shaft G, and working the same, as hereinafter described. This shaft E is attached to the frame of the machine by two or more strong arms screwed to the front-side beam thereof, but extending upward and forward to a sufficient distance from said side beam to afford room for the pulley F to be rotated. This shaft E passes through said arms and revolves therein, as shown in Fig. 4 of the drawings.

The small shaft G is attached to said front-side beam by passing through two upright arms attached thereto, and is revolved by a belt from the pulley F on the shaft E, as shown at L.

Immediately outside the arms in which the shaft G revolves I affix the set-screws M M, the adjustable nuts N N, and boxes O O, in which the said nuts may be moved and adjusted. The boxes O O are fastened to the shaft by steel pins, which pass through both the boxes and the shaft, and a suitable crank-movement is given to the arms I I by adjusting the nuts N N in said boxes by means of said set-screws to or from the center of said shaft.

The arms I I are attached to the shaft G by the set-screws M M, and they are also connected with the oscillating shaft V by placing their opposite ends in grooves or lips extending from the front side of the shaft V, and fastening them therein by pins, on which they work, as shown at K K on the drawings.

P is a shaft, on the front end of which is one of the pulleys C, and one of the cog-wheels D, as above described. On the opposite end of this shaft I attach a pulley, Q, which is connected by a belt with the large pulley R, hereinafter mentioned. On the center of this shaft P, I fasten a grooved pulley, S, which is connected by a round belt running in its groove with another grooved pulley, S, on shaft T, hereinafter described, and working in connection therewith, as shown by Fig. 3. The end of said shaft P, opposite the cog-wheels, but inside the pulley Q, rests, and revolves in a square variable box, (marked U,) which is set in a slot on an upright post attached to the frame. This arrangement is made to allow the end of the shaft to raise or lower in proportion to the size of the mass of bristles that may be passed under the said grooved pulley and round belt, as hereinafter set forth. The central portion of this shaft P is made in a square form, and is adjusted to the size of the opening in grooved pulley S, so that the said pulley may oscillate thereon with ease and accuracy. This shaft P, next the end thereof on which the cog-wheel is placed, rests on a bearing constructed as follows, namely: I pass it through a pivot-box, (marked Z,) which is held in its place by a set-screw passing through an upright slotted post on the frame of the machine. This device allows the opposite end of the shaft to

be raised vertically to any desired altitude, and thereby regulates its position to the mass of bristles that may be passed under the pulley thereon.

The grooved pulley on said shaft is held securely in its place by clamps, which pass over each side thereof, and which are screwed down firmly on its elongated sides.

The shaft T is constructed and adjusted in all respects like the shaft P, above described, except that it has no pulley on the end thereof opposite the cog-wheel. It rests on a pivot-box, Z, and a variable box, U, and has a grooved pulley, S, corresponding in shape and function to those above mentioned on shaft P, and in every particular these are duplicates thereof.

V is an oscillating shaft, attached at its ends to the shafts P and T, and the same clamps which hold the grooved pulleys S S on said shafts serve to fasten it firmly to said shaft and said pulleys. Its movement is regulated by the length of the crank motion given to the arms I I by the adjustment of the nuts N N, as above described, and, being connected with the grooved pulleys S S, it communicates the same motion to them which it receives from the arms I I.

The large pulley R is fastened on a shaft secured to the under side of the frame. On this last-mentioned shaft, near the center thereof, I attach a large drum or wheel, so corrugated as to be adjusted to the anti-friction rollers of an endless traveling platform, as shown in the drawings at *a a* on Fig. 4. It is connected with the pulley Q by a belt, which moves them conjointly, but is made large in order to give a slow movement to said drum.

I also construct another shaft and drum thereon, which I place at the opposite end of the frame, inside the supporting-pillars. This drum is likewise marked *a a*. It revolves with the last-mentioned shaft by the action and movement of the endless traveling platform, as hereinafter shown.

W is an endless traveling platform, which passes around the drums *a a*, one of which it causes to revolve, as above mentioned, by its anti-friction rollers, which work closely in the corrugations thereof. It is constructed in the usual form, with slats fastened together by grooves and pins. At each end of the pins, however, I attach anti-friction rollers to work in the corrugations of the aforesaid drums. I also fasten small strips near the center thereof, on the outside, at such a distance apart as that they may serve as guides to a leathern belt which surrounds the traveling platform and is held in position between said small strips. These anti-friction rollers are adjusted to the corrugations in said drums, and the platform is moved with the same rapidity as the drums around which it passes. Fig. 2 represents a section of this traveling platform.

Around the rollers A A, I place three endless belts, (marked Y Y Y on Fig 1.) These belts extend around the traveling platform, and make the entire circuit of the machine. The central belt of these three runs in the grooves on said platform made by the small strips above mentioned, and passes immediately under the grooved-pulleys S S and the round belt that runs in the same. Immediately above this central belt and the said round belt, and on the lower side of the oscillating shaft V, in grooves made therein, I place a series of small rollers, grooved or otherwise, on which the said round belt moves, and by which its vibratory motions are partially regulated.

The mode of operating my said device is as follows, to wit: I attach sufficient motive power to that end of the shaft E where the crank is placed in the drawings, Fig. 4. As the power revolves this shaft, the worm-screws thereon, working in the cog-wheels D D, impart a rotary motion to the shafts P and T. The large pulley R is rotated by the belt on pulley Q, and the small pulleys B B, with the rollers to which they are attached, are moved by the belts from pulleys C C. It follows that the traveling platform and leather belts Y Y Y are compelled to move on their endless circuits.

It will readily be perceived, also, that as the shaft E revolves, the pulley F, connected, as described, by a belt with the small shaft G, causes the last-mentioned shaft to rotate also. Now, as a crank motion is secured to the arms I I by a proper adjustment of the adjustable nuts N N, and from said arms communicated to the oscillating shaft V, it follows that shaft V, grooved pulleys S S, and the round belt thereon, are made to oscillate sidewise with such speed of motion as I may require.

The bristles to be separated are placed upon the three belts Y Y Y, and are carried thereby under the grooved pulleys S S and the round belt thereon. The oscillating movement above mentioned of these pulleys and belt causes said belt to rub closely upon the beard of the bristles, and thereby crowd them each way, the butts outward. After having passed the farthermost grooved pulley the bristles are taken off and are ready for use.

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

1. The grooved pulleys S S and the round belt thereon, constructed and operated substantially as and for the purposes specified.

2. The endless traveling platform W, with the anti-friction rollers thereon on the inside, and the small guiding-strips on the outside, combined with the large pulley R and the drums *a a*, substantially as and for the purpose set forth.

3. The three belts Y Y Y, in combination with the traveling platform W and rollers A A, when constructed and operated substantially as and for the purpose herein specified.

4. The shaft E and worm-gear thereon, in combination with the cog-wheels D D and pul-

leys C C and F, substantially as and for the purpose set forth.

5. The arms I I, oscillating shaft V, with the small rollers on the under side thereof, the boxes O O, nuts N N, and the set-screws connected therewith, combined and arranged substantially as and for the purpose described.

6. The variable boxes U U, combined with the shafts P and T, and the pivot-boxes Z Z, and set-screws thereto, substantially as and for the purpose set forth.

7. The entire machine, with its described devices, constructed and operated substantially as and for the purposes specified.

NATHAN H. SPAFFORD.

Witnesses:
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