(No Model.) 2 Sheets—Sheet 1.

G. BEEKMAN.

COTTON HARVESTING DEVICE.

No. 493,010. Patented Mar. 7, 1893.

Fig. 1.

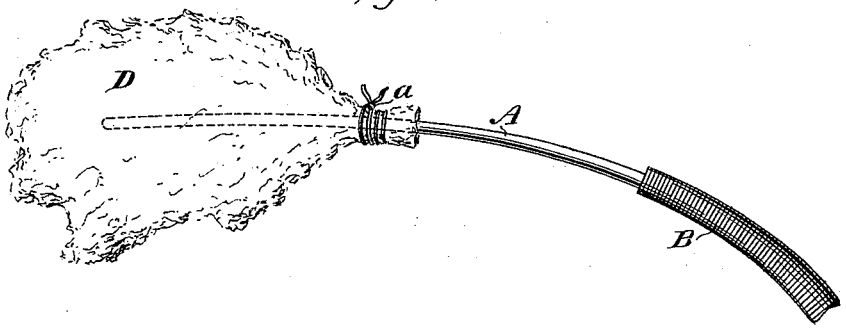
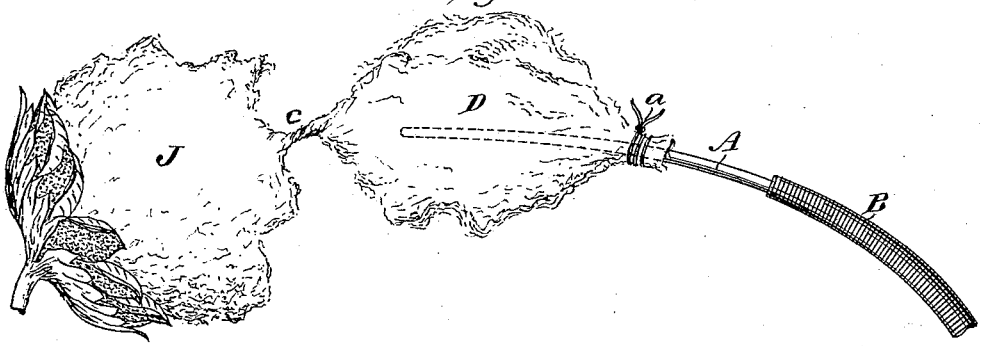


Fig. 2.



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(No Model.) 2 Sheets—Sheet 2.

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Fig. 3.

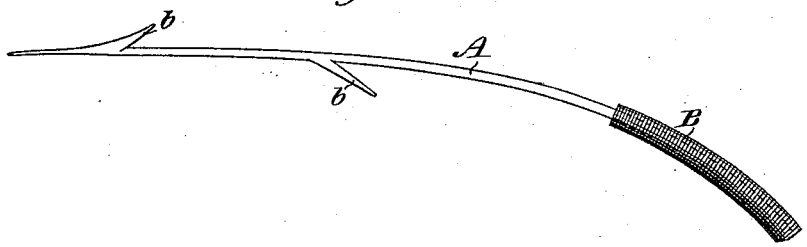


Fig. 4.

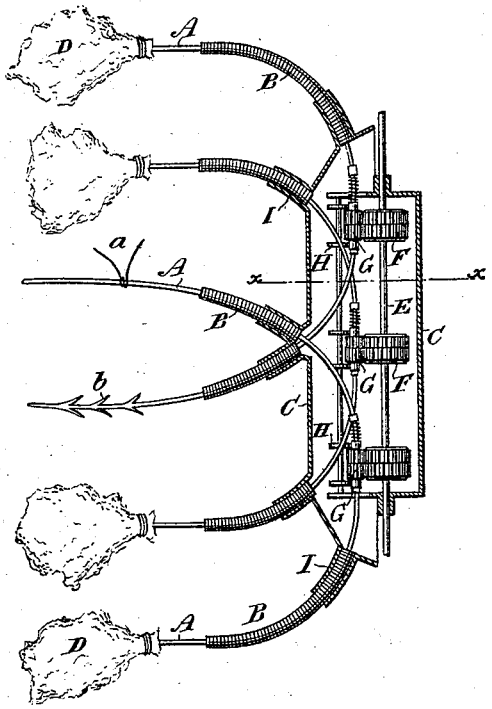
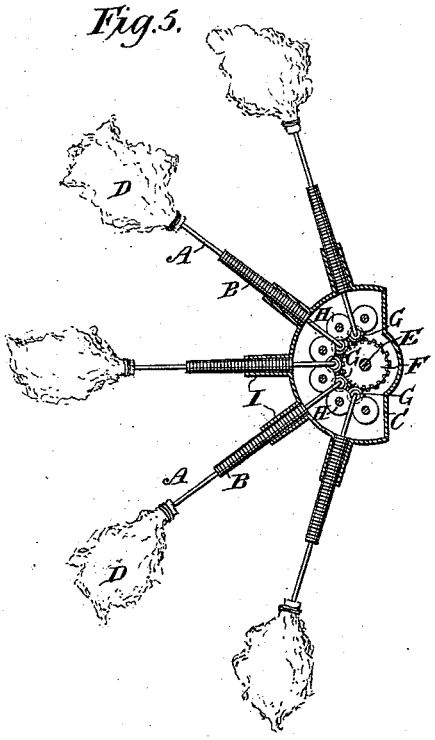


Fig. 5.



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UNITED STATES PATENT OFFICE.

GERARD BEEKMAN, OF NEW YORK, N. Y.

COTTON-HARVESTING DEVICE.

SPECIFICATION forming part of Letters Patent No. 493,010, dated March 7, 1893.

Application filed May 25, 1892. Serial No. 434,359. (No model.)

To all whom it may concern:

Be it known that I, GERARD BEEKMAN, a citizen of the United States, residing in the city, county, and State of New York, have invented certain new and useful Improvements in Cotton-Harvesting Devices, of which the following is a specification.

Rotary pickers used heretofore have been characterized by two distinctions among others; one class in which the revolving picking stems are of such diameter as to present but one side of the revolving part to any portion of cotton in the plant at a time, the extraction being effected by means of barbs or other suitable roughened surface of such revolving part; the fiber being practically hooked out of the boll of the plant. The other class in which the revolving stem is of such small diameter, that whether the surface be roughened or not, it shall obtain its purchase on the cotton by winding the fiber around the entire circumference of the revolving part, immediately after initial contact and before the extraction begins; the attachment being formed by the wrapping of the cotton fibers around the stem and the extraction being effected by the roping of the fibers together beyond the end of the picker, or beyond the initial point of its contact, as the machine progresses. On the principle of the latter class, my present invention is intended to operate, departing, however, in certain respects, namely; first, in depending for its operation, not upon form, but upon structure; and second, engaging with the cotton in the plant by the initial contact of any portion of a maximum volume of material composing the picker, thereby proportionately extending the range of search. A torsional connection with the growing cotton is produced out of the material of the picker at any point, which is indeterminate until initial contact shall have taken place.

To these ends my invention consists in the employment of a revolving mass of cotton or other fiber in its native or non-woven state in the manner hereinafter fully described.

Referring to the accompanying drawings: Figure 1, illustrates a side elevation of one picking device; Fig. 2, a similar view illustrating the operation of the same; Fig. 3, a detail view of a rotary stem suitably constructed for the convenient reception of the picking material; Fig. 4, a sectional side elevation showing several picking devices assembled upon a suitable device for supporting the same; and Fig. 5, a horizontal section of Fig. 4, taken on the line *x*, *x*.

A, represents a suitable revolving stem or shaft of flexible or of rigid character, as may be desired.

B, is a tubular flexible supporting arm for the revolving stem or shaft A; and C, the frame or oscillatory support hereinafter described.

D, represents the fibrous material. This may be composed of the cotton fiber itself in its native state, or of any other suitable fibrous material having a similar structural character employed in a non-woven state; that is to say, composed of flexible finely attenuated adhesive fibers, irregularly combined in a mass, leaving interstices between them; and thus distinguished from a fibrous body such as cord or cloth or other artificial structure in which the fibers are entwined or interlaced into a textile fabric and united by close connection or intermixture into a permanently organized relation. The fibrous material D, is attached to the shaft A, in any suitable manner, either permanently or temporarily. I have illustrated, for example, the attachment of the fiber to the shaft A; by means of a tie formed by winding the free ends of a string *a*, about the fibrous mass, and knotting it together.

The stem A, is illustrated as projecting into the mass of cotton or other fiber at a suitable distance, in order to form functionally a supporting core that shall hold the mass throughout the length of the same as nearly concentric as possible to the axis on which the extremity of the stem A, revolves.

In Fig. 3, I illustrate barbs *b*, on the stem A, which are so adapted that a mass of native cotton taken in the hand may be thrust over the barbs and remain retained thereon until it is seen fit to remove the mass, or cause its removal.

Any suitable form of actuating mechanism may be employed in connection with my improved means of picking. I have illustrated one suitable form in Figs. 4 and 5. This consists in a mechanism which is similar in its

general features to that described and claimed in my patent application Serial No. 389,932, filed April 22, 1891, in which there are several picker cases or groups of pickers as shown herein in Fig. 4, attached to a rotary support whereby each group of pickers is revolved backward in an orbit at substantially the same rate of speed as the motion of the harvester over the ground. Thus a retrograde movement of the pickers is obtained, whereby they advance and retract among the branches of the bush, traveling with the same, and search for every ripe portion of cotton that may be exposed.

The mechanism in Figs. 4 and 5, consists in a driving shaft E, bearing toothed gears F, upon which the gears G, are kept in gearing by idle spindles H, having suitable bearings in the case C. Each bobbin G, bears two flexible shafts or stems A, projecting in each direction from its axis, supporting the holder for the fiber to be rotated. The case C, is provided with flexible arms B, composed of coiled wire or other material which will yield when in contact with the branches of the plant. The shafts A, rotate freely in the tubular arms B.

Any other suitable form of operating mechanism than that herein illustrated may be used in connection with my present invention; for example, that illustrated in my Letters Patent No. 427,218, granted May 6, 1890, or in my Letters Patent No. 436,770, granted September 23, 1890.

The operation of my invention is illustrated in Fig. 2, which is as follows: The fibrous picking material D, rapidly rotated while moved through the plant will at the initial contact of any part of its exterior with the native fiber J, on a boll of the plant, immediately form a torsional connection *c*, between the two by the operation of spinning, which will cause the fibers of the picker and of the boll to adhere at the axis of rotation. As the spinning continues the torsional connection *c*, tends to form a cord or rope, and before the revolving mass D, has moved far enough through the plant by the progress of the machine to have parted from the native mass J, the two will have become connected together by means of the cord or rope with sufficient firmness to break the natural attachment of the cotton J with the bottom of the boll of the plant and thus extract the growing cotton. The picked cotton is then suspended by the connection *c*, until the stripping device of the machine removes the same in any suitable or well known manner. A torsional connection between the revolving mass of fiber in its native state and the growing fiber is thus produced out of the material of which the picker is formed, at a point which is indeterminate until the initial contact takes place. An axis of rotation is then determined at whatever part of the exterior surface of the revolving mass such initial contact occurs, and during successive operations the torsional formations of the material occur at different parts, and as the picked cotton is separated from the rotating mass between each period of its passage through the plants, the connection is broken at a variety of places, tending to equalize the disturbance of the rotary mass and avoid undue distortion of the same repeatedly at any particular part.

The herein-described picker possesses the following advantages: First, of extending the range of search through the plants to the maximum; second, of affording such a delicate means of searching the branches as shall avoid knocking off and wasting any ripe portions of the growing cotton, or injuring those portions that are partially ripe, or damaging the plant; third, of providing a picker that may admit of the separation therefrom of the cotton that has been removed from the plant, between each periodical passage of the picker through the branches without requiring the stoppage of the revolution of the picking device upon its own axis, thus reducing complication of gearing and friction; and fourth, of easily renewing the picker when composed of the native cotton itself, from the material in the field without expense.

Having thus fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. A device for picking cotton, consisting in a revoluble mass of cotton or other fiber of similar structural character, and suitable mechanism for rotating the mass upon its own axis; the fibers of the said mass being exposed in their native or non-woven state, and adapted to engage with and extract the growing cotton, substantially as described.

2. The combination in a cotton picking device, of a mass of cotton or other fiber of similar structural character in its native or non-woven state, and a rotary supporting stem extending into the center of the mass and secured thereto, forming a core substantially as and for the purposes described.

GERARD BEEKMAN.

Witnesses:
EUGENE LUCAS,
H. F. PARKER.