

No. 841,358.

T. TOWNSEND.

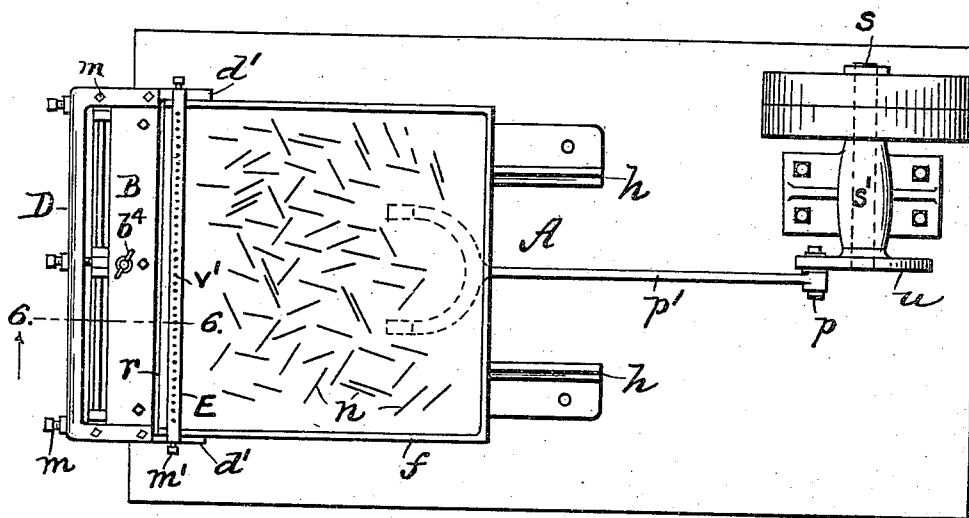
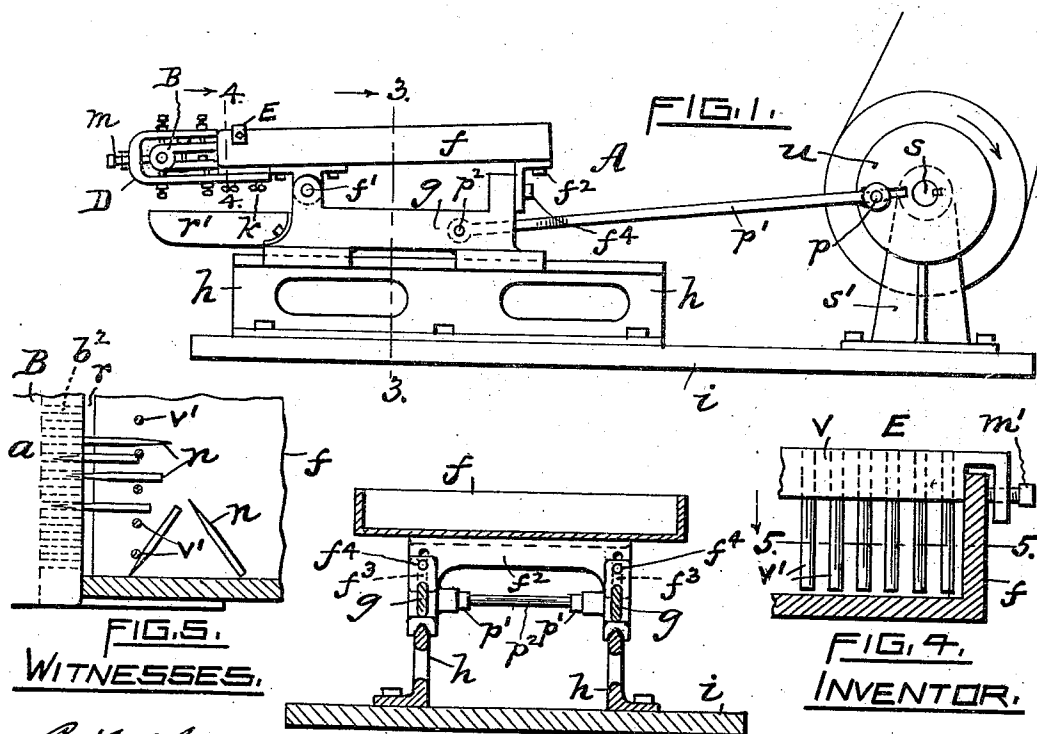
PATENTED JAN. 15, 1907.

MACHINE FOR INSERTING COMBING NEEDLES IN TEMPORARY
HOLDERS OR BOOKS.

APPLICATION FILED SEPT. 7, 1906.

2 SHEETS—SHEET 1.

FIG. 2.



C. Y. Hannigan.
C. E. Snee

FIG. 3.

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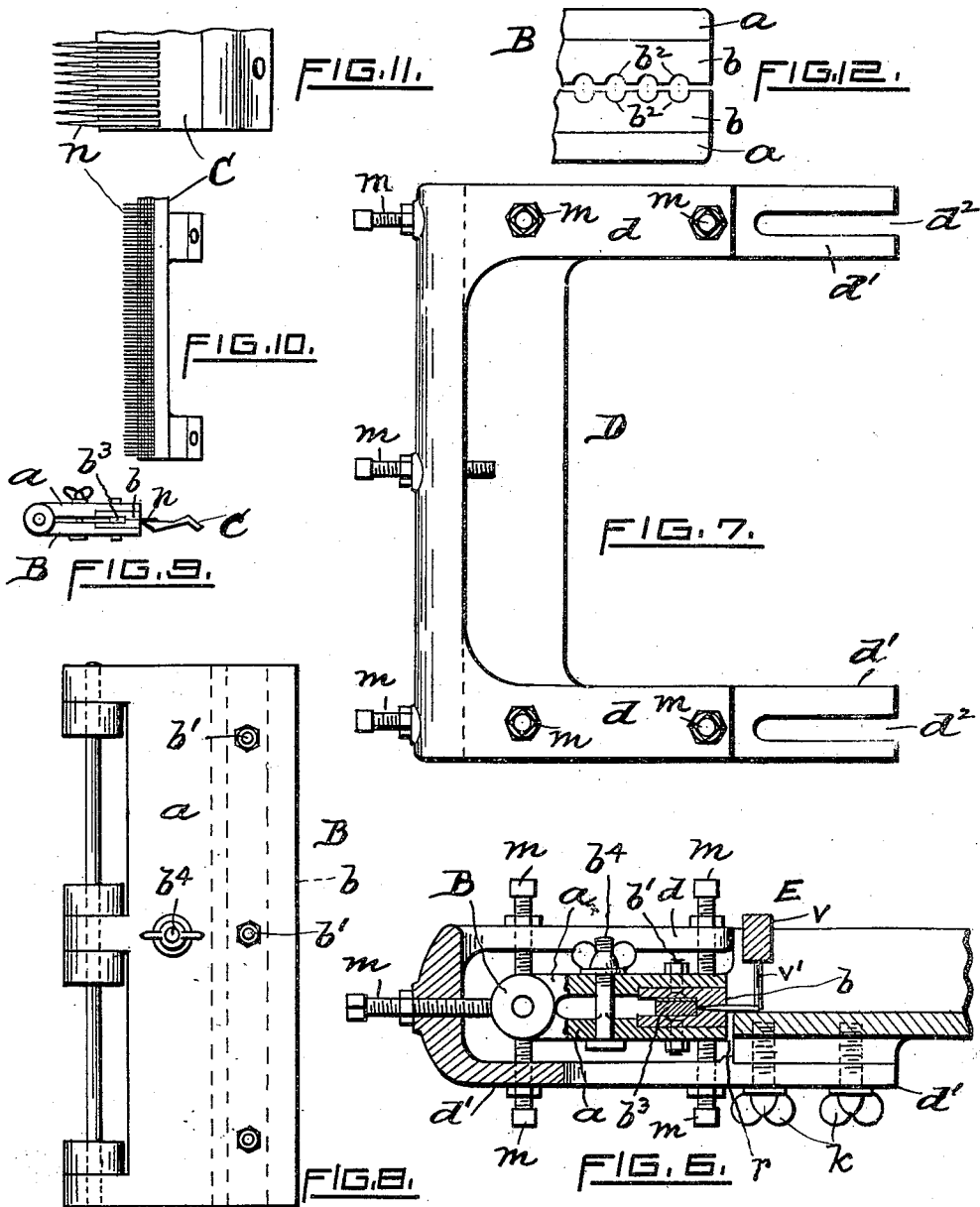
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2 SHEETS—SHEET 2.



WITNESSES.

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UNITED STATES PATENT OFFICE.

THOMAS TOWNSEND, OF PROVIDENCE, RHODE ISLAND.

MACHINE FOR INSERTING COMBING-NEEDLES IN TEMPORARY HOLDERS OR BOOKS.

No. 841,358.

Specification of Letters Patent.

Patented Jan. 15, 1907.

Application filed September 7, 1906. Serial No. 333,656.

To all whom it may concern:

Be it known that I, THOMAS TOWNSEND, a citizen of the United States of America, and a resident of Providence, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Machines for Inserting Combing-Needles in Temporary Holders or Books, of which the following is a specification.

My invention relates to novel improvements in machines for automatically positioning and inserting needles or pins in a separable holder or "book," so called, preparatory to soldering them to a suitable back or bar, the latter then forming a comb in which said needles constitute the teeth.

In United States Patent No. 723,080, granted to me March 17, 1903, is illustrated and described a machine for mechanically feeding the needles and filling the clamping block or book. I may state here that in general fiber-combing machines as usually constructed are provided with suitably-actuated cylinders or members having a plurality of combs adjustably mounted therein. The sharpened teeth or needles of the combs are adapted to engage the staple or fibers of the material being acted upon, so as to lay them (the fibers) substantially parallel with one another preparatory to converting them into sliver.

The object sought to be attained in my present invention is to produce a comparatively inexpensive machine in which the needles, which latter constitute the comb-teeth, as above stated, are automatically positioned and filled in the book with greater facility and efficiency, the machine, moreover, being simple in construction and its operative parts readily accessible.

To this end my invention consists, essentially, of a pan or reservoir for containing the loose needles, a suitably-mounted book or holder having a row of properly spaced and aligned holes or grooves registering with the bottom of the pan, and means for shaking or reciprocating the pan and book in unison, all constructed and arranged so that any of the thus-agitated needles when in proper alignment with said exposed holes enter therein, the action being continued until practically all the holes of the book are filled.

During the foregoing-described operation some of the mispositioned needles drop through an opening formed between the ad-

jacent edges of the book and pan into a receptacle beneath, while at the same time the shaking movement causes other of the needles to become segregated and some to become mixed with the greater mass of needles in the reservoir. The thus-filled book is next removed from the machine and an empty one substituted therefor, which is filled in turn. The removed book is placed on edge, (the row of needles being uppermost,) while the attendant, by means of a "straight-edge," presses the needles downwardly in the holes until all are arrested by the stop-gage, followed by firmly clamping the sides or jaws of the book together. The butt portion of the needles projecting from the book (all then being in alinement) are next soldered to the top or plane surface of a suitably-positioned back or bar member constructed as usual, after which the jaws of the book are slightly separated, thereby freeing the thus completed or filled comb. The latter is now adapted to be inserted in the cylinder of a combing-machine and brought into action, substantially as usual in machines of this type.

In the accompanying two sheets of drawings, Figure 1 represents a front side elevation of an automatic needle-inserting machine embodying my present invention. Fig. 2 is a corresponding plan view. Fig. 3 is a transverse section taken on line 3-3 of Fig. 1. Fig. 4 is a partial transverse sectional view, on enlarged scale, taken on line 4-4 of Fig. 1. Fig. 5 is a partial horizontal sectional view taken on line 5-5 of Fig. 4. Fig. 6 is a longitudinal sectional view, enlarged, taken on line 6-6 of Fig. 2. Fig. 7 is a plan view of the book holder or frame detached from the machine, the book also being omitted. Fig. 8 is a plan view of the book itself, the needles being omitted. Fig. 9 is an end view of the book in reduced scale, showing the relation of the comb-bar to the book and its needles while the latter are being soldered to the bar. Fig. 10 is a plan view of the comb, a portion being broken away. Fig. 11 is a similar view, greatly enlarged; and Fig. 12 represents in elevation a portion of the face of the book before the jaws are fully clamped together, the needles being omitted.

I would state that the needles or pins *n*, the comb *C*, and lined book *B*, as illustrated, are well known, and I therefore do not specifically claim them herewith. It may be added, however, that the book consists of the

two folding or hinged upper and lower flat plates *a*, each having a gage-bar *b*, of brass or other suitable metal, secured thereto by bolts *b'*. The said members *b* are oppositely disposed and extend longitudinally of the book, the adjacent faces being provided with suitably spaced and alined grooves *b²*, each pair of grooves being parallel and adapted to receive therein only the smaller or sharpened end portion of a needle *n*. At the back end of the grooves is located a longitudinally-extending straight stop-bar *b³*, the same being secured, say, to the lower one of the flat plate members *a*. This bar, which may be made of wood or suitable metal, forms a stop for limiting the distance the pointed end of the needles may be inserted in the members *b*, and since all the needles are uniform in length it follows that when they are properly positioned therein the ends of the exposed portions projecting beyond the front edge of the book will be in alinement also. The two plates *a* of the book are adapted to be clamped together as desired by means of the bolt and nut *b⁴*.

In carrying out my invention as embodied in the illustrated machine A, I employ a suitably-shaped flat shallow pan or reservoir *f* for containing the needles *n* in a loose state. Said pan is as drawn hinged and secured to a pair of side frames *g* and fitted to reciprocate back and forth on fixed horizontal parallel ways *h*, in turn secured to a base *i*. The pan is located above said side frames *g* and hinged thereto at *f'*. To the under side of the opposite or rear end of the pan is fixed a transverse bracket *f²*, having slots *f³*, Fig. 3, through which pass clamping-bolts *f⁴*, tapped into the adjacent ends of the frames *g*. (See also Fig. 1.) By means of the device last referred to the pan can be swung and adjustably secured in any desired angle within its limit or range of movement.

A reciprocating rectilinear or shaking motion may be given to the pan in any well-known manner. As drawn, the driving arrangement embodies a belt-driven shaft *s*, revoluble in a bearing member or stand *s'*, secured to the base *i*. A slotted crank-disk *u* is fixed to the inner end of said shaft, the crank-pin *p* passing through the slot and being adjustably secured to the crank. A connecting-rod *p'*, jointed to the crank-pin and to a pin *p²*, mounted in the side frames or cross-head *g*, reciprocates the latter and the needle-carrying pan *f* in unison and at the same rate of speed, all as clearly shown.

To one end, which may be termed the "front" end, of the reservoir *f* is removably secured the book-holder frame D. (Shown more clearly in Figs. 6 and 7.) This frame member equals or exceeds the length of the pan and is adapted to carry the book and to be attached to the pan in any suitable way,

the arrangement being such that all the said members are adapted to move simultaneously and in unison. As drawn, the end portions of the frame D are substantially U-shaped, the upper and lower sides *d d'* thereof being separated, so as to freely receive the book B. The lower end members *d'* are slotted at *d²* and are seated snugly against lugs formed on the under side of the pan, bolts *k* serving to maintain the holder in place. The latter may be provided with a series of suitably-arranged screws *m* for adjustably securing the book in position in the holder, whereby the face or edge of the grooved or apertured gage-bars *b* may be accurately adjusted with respect to the corresponding edge and bottom of the reservoir. It will be seen that the vertical sides or wall of the latter does not extend across the front end adjacent the face of the book. The latter, however, practically constitutes the equivalent thereof. An unobstructed narrow opening *r* is provided at the bottom between the front edge of the pan and the face of the book for the free escape of improperly-positioned needles at that point. These latter fall directly into a suitable receptacle or vessel *r'*, secured to the movable side frames *g*. (See Fig. 1.)

A guard or separator E is located at or near the front end of the reservoir *f*. It consists of a bar *v*, extending horizontally across the top and arranged to be adjustably secured to the side walls by means of end screws *m'* and is provided with a series of suitably-spaced downwardly-extending fingers *v'*. The function of this device is to separate the needles to some extent, thereby preventing them from massing in front of the gage-bars *b* of the book. The device also serves to assist in guiding the needles so that they more readily assume a degree of parallelism preliminary to entering the openings *b²* of the gage-bars.

The following describes the manner of operation: The proper gage-bars *b* (selected with respect to the thickness of the needles to be used) are first secured in the suitably-adjusted book B. The latter is then mounted in the holder or book-frame D and the whole firmly secured to the reservoir—say by the bolts *k*. The book is next accurately adjusted by means of the screws *m*, so as to allow a suitable space *r* between it and the front edge of the pan's bottom, while at the same time providing that the top surface of the latter is in alinement or registers with the lower side of the grooves *b²*. The needle-guard E should be adjusted or positioned nearer to or farther from the open end of the reservoir, according to the length of the needles to be used, or, in other words, the distance from the edge of the book to the guard-fingers *v'* is materially less than the length of the needle. The pan may be tilted, if de-

sired, and secured in such adjusted position by screwing up the bolts f^4 . Now upon setting the machine in motion the action of the revolving crank, &c., will impart a reciprocating rectilinear movement to the supported and guided frame or cross-head g and all the parts or members carried by it. The result of said movement agitates the needles contained in the reservoir and will cause them to separate from one another, some of them gradually alining themselves with and entering the holes b^2 . Others are temporarily arrested by the fingers v' , and still others may after passing the fingers become mispositioned and drop through the opening r into the receiver r' . After running the machine a comparatively short time practically all the holes of the pair of gage members b will become filled with the needles. The machine is then stopped and the book-carrying frame D detached, followed by removing the thus-charged book, the substitution of an empty one, &c., substantially as hereinbefore stated. If desired, the cross-head g , pan f , and its attached parts may be readily tilted upwardly from the front end before the frame D is removed, thereby causing the loose needles to slide to the rear end of the pan, after which the parts may be returned to the normal working position, followed by removing the frame and its book.

My improved book charging or filling machine A although being comparatively simple in construction, as hereinbefore described, nevertheless possesses great practical advantages, from the fact that it is capable of performing in a given time an amount of work exceeding that of several operatives wherein the books are filled manually.

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

1. In a machine of the character described for automatically inserting needles or analogous members, the combination of a reservoir for containing the needles in a loose state, a needle-receiving device provided with holes arranged to receive needles therein direct from the reservoir without the intervention of a runway, and means for imparting a shaking movement to the said reservoir and needle-receiving device.

2. In a machine of the character described, the combination of a mechanically-movable reservoir for containing needles or analogous articles, a frame or holder secured to and movable in unison with the reservoir, a book adjustably mounted in said frame, and members fixed in said book provided with a row of holes arranged with respect to the reservoir, so that the action of the moving parts automatically positions the needles and causes them to enter the said holes of the book members.

3. In a machine of the character described, the combination with a suitably-mounted mechanically-movable reservoir for containing needles, of an adjustably-mounted book, so-called, removably-secured to and movable in unison with said reservoir, gage-bars secured in said book having suitably-arranged holes therein positioned so as to receive needles direct from the reservoir, the latter and the book being so placed that a narrow space r extending longitudinally of said gage-bars is formed between the vertical face of the latter and the adjacent front edge of the bottom of the reservoir through which mispositioned needles may pass and fall by gravity.

4. In a machine of the character described, the combination of a movable needle-carrying pan, a correspondingly-movable needle-receiver provided with a row of alined holes arranged to automatically receive needles therein direct from the said pan, and a separator movable with the latter and provided with fingers extending downwardly into the reservoir to assist in segregating and positioning the needles.

5. In a machine of the character described, the combination with fixed ways and a cross-head intermittingly movable back and forth thereon, of a needle-carrying pan hinged to and movable with said frame, and means for tilting the said pan in angular planes with respect to the frame and securing it in such adjusted position.

6. In a machine of the character described, the combination of a needle-carrying reservoir open at its front end, a holder-frame D removably secured to said end portion of the reservoir, a book B adjustably mounted and secured in said frame and having a row of suitably-spaced holes or grooves in alinement with the bottom of the reservoir and located contiguous to the front end thereof, and means for imparting intermittent reciprocating rectilinear movements to the said reservoir, frame, and book members, substantially as described.

7. In a machine of the character described, fixed ways, a frame movably supported thereon, a receptacle movable with said frame for receiving mispositioned needles, and driving means for reciprocating the frame at a comparatively slow rate of speed, in combination with a needle-carrying reservoir secured to and movable in unison with said frame, and a device detachably secured to the front end of the reservoir provided with suitably formed and disposed holes arranged and adapted when the machine is in action to receive needles into said holes direct from the reservoir.

8. In a machine of the character described, the combination of a suitably-mounted needle-carrying reservoir, means operatively connected therewith for imparting to it a re-

ciprocating rectilinear movement, a device
for varying the length of stroke of said move-
ment, and a device movable in unison with
the reservoir and provided with openings
5 registering with the bottom of the latter,
constructed and arranged so that in action
any needles when in proper position and in
alinement with said openings may enter

therein direct from the reservoir, substan-
tially as described. 10

Signed at Providence, Rhode Island, this
5th day of September, 1906.

THOMAS TOWNSEND.

Witnesses:

GEO. H. REMINGTON,
C. E. INCE.