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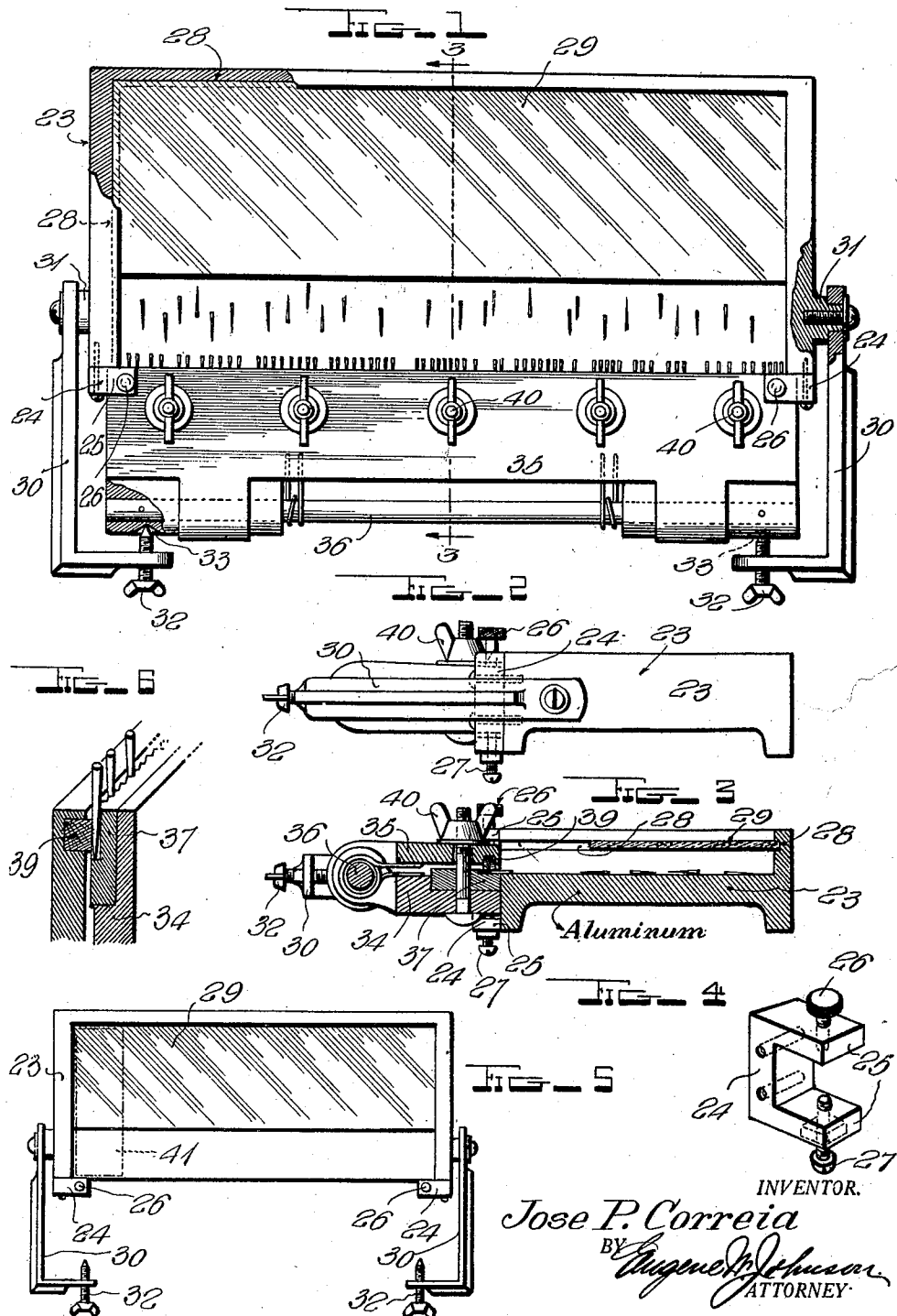
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J. P. CORREIA

MACHINE FOR INSERTING COMBING NEEDLES IN BOOKS

Filed Sept. 26, 1922

3 Sheets-Sheet 1



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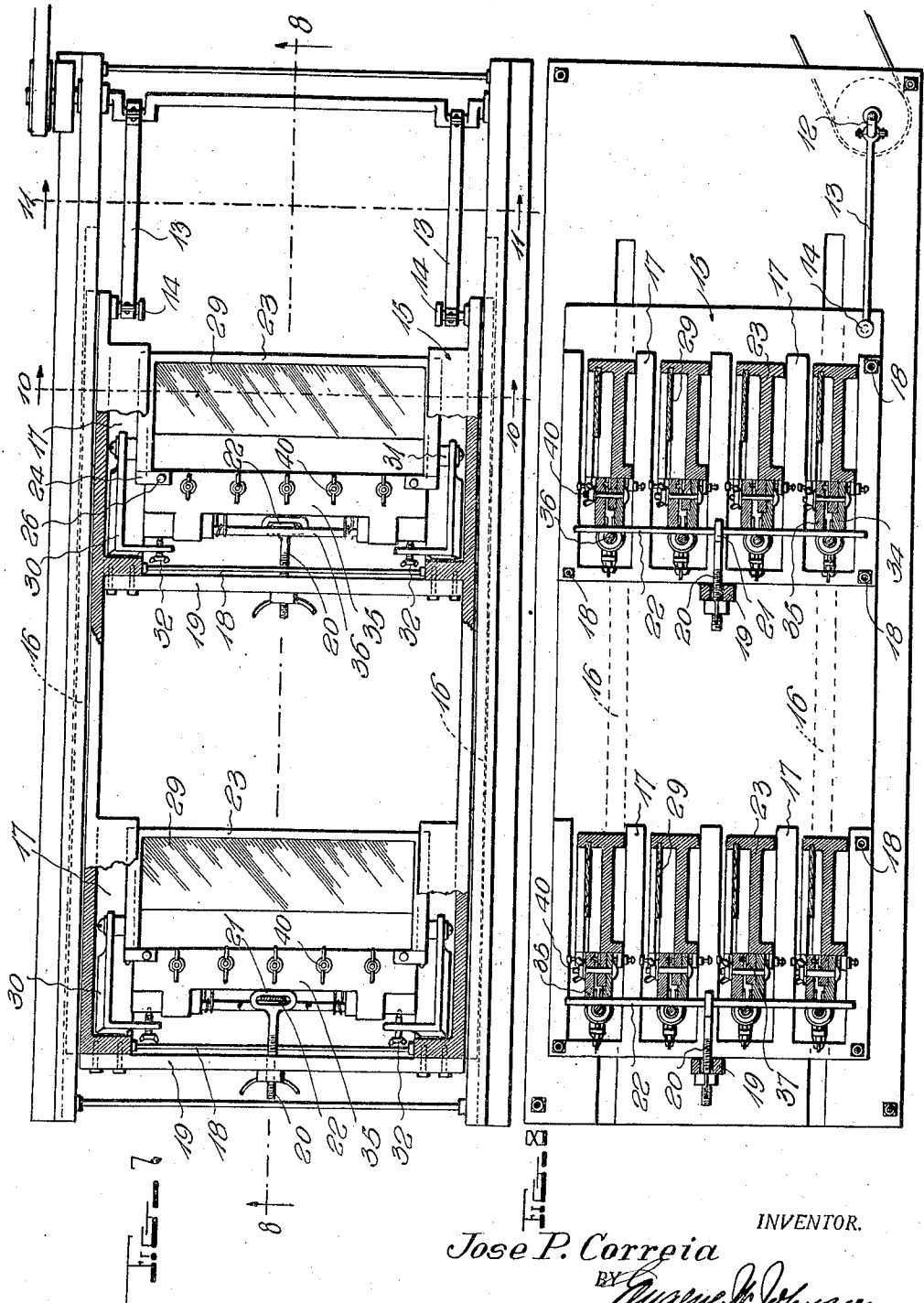
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3 Sheets-Sheet 2



INVENTOR.
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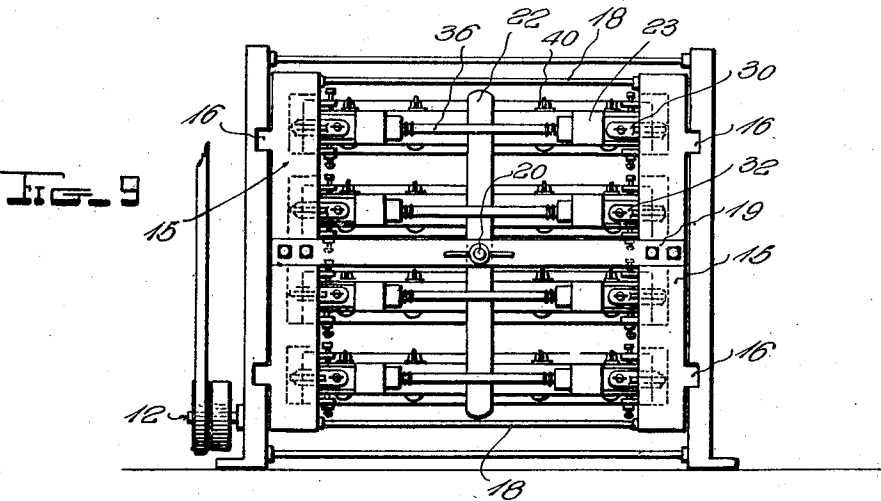
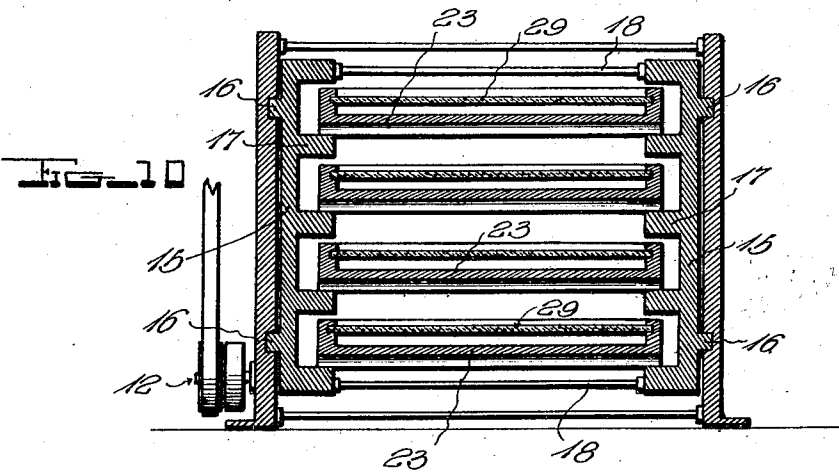
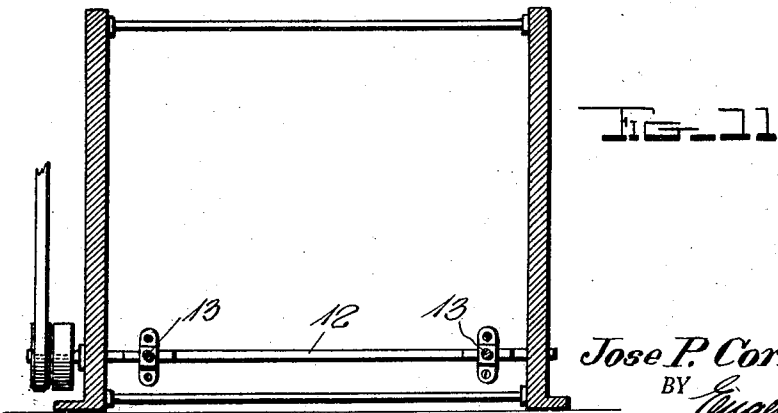
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3 Sheets-Sheet 3



INVENTOR.

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UNITED STATES PATENT OFFICE.

JOSE P. CORREIA, OF NEW BEDFORD, MASSACHUSETTS.

MACHINE FOR INSERTING COMBING NEEDLES IN BOOKS.

Application filed September 26, 1922. Serial No. 590,683.

To all whom it may concern:

Be it known that I, JOSE P. CORREIA, a citizen of the United States of America, and a resident of New Bedford, in the county of Bristol and State of Massachusetts, have invented certain new and useful Improvements in Machines for Inserting Combing Needles in Books, of which the following is a specification.

This invention relates to certain new and useful improvements in machines for inserting combing needles in books, and has for its object to provide a machine that will successfully insert fiber combing needles in books, such needles when assembled therein being held in line and spaced to provide the teeth of comb when soldered or otherwise secured to a metal strip or back, the product being used to re-needle half laps and top combs of fiber combing machines.

In the following specification the term "needle" is applied to the teeth used in the production of half laps or top combs, they being similar to the pointed ends of a needle or headless pin, the needles of a comb bar being used to parallel the fibers of cotton or other staple, and the needles will be spaced so that from twenty to eighty-four will occupy a space, when placed side by side, equal to one inch. The term "book" is applied to a clamp the inner face of one of the jaws carrying a serrated spacing strip and a stop bar which controls the depth that the needles will enter the serrations in the spacing strip, the complemental jaw receiving a clamping strip, usually of wood, for holding the needles in place between the spacing strip and the clamping strip when the jaws are in clamping position. In practice the length of a book is about fourteen inches.

A machine made to accord with my invention operates to insert a row of needles in a book, where they are held until attached to a metal strip to form a comb for half laps and top combs of combing machines.

A machine in which is embodied my invention comprises a partially covered needle receptacle having means for associating therewith a book, such needle receptacle having a partial cover which forms a pocket for the needles, the receptacle being adapted

to be maintained in an upright position when attaching and removing a book therefrom.

My invention also consists of a receptacle having means for attaching the same to a book in such position that the surface of the receptacle upon which the needles are placed will be in line with the spacing strip of the book, the dales of the serrations being in line with the plane surface of the receptacle and so held that upon appropriate horizontal reciprocation of the receptacle and book the pointed ends of needles will enter recesses formed between the spacing strip and a clamping strip of the book.

My invention also consists of a supporting frame for a horizontally maintained reciprocatory carriage that is provided with a plurality of supports for receptacles for needles and books which are adapted to be removably attached to the carriage, whereby a number of books may be filled simultaneously.

My invention further consists in a machine which comprises a supporting frame, a reciprocatory carriage mounted on the frame, the carriage being of appropriate construction and provided with means for maintaining in non-movable engagement therewith a plurality of individually connected needle receptacles to provide means for simultaneously filling several books with comb needles.

My invention further consists in a machine for inserting combing needles in books of a needle receptacle having a surface of aluminum, such receptacle in use being maintained in a horizontal position and reciprocated to effect the placing of comb-needles in a book attached to such receptacle.

My invention further consists in a machine for inserting combing needles in books in which the needle receptacle is made of aluminum or equivalent material, the same having a plane surface upon which the needles move when the receptacle is reciprocated, such receptacle having a cover which overlies a major portion of the receptacle, the book and receptacle being appropriately connected with a reciprocatory support, whereby the needles are caused to travel upon the plane

surface of the receptacle longitudinally in a direction toward and into the book, said needles moving in a direction toward and away from the book with their points in the direction of their line of travel.

My invention further consists in the construction and arrangement of parts of a machine for mechanically assembling combing needles in books, as hereinafter described, with such changes or modification of structure as may be the equivalent of the means illustrated by the accompanying drawings, which show a preferred embodiment of the invention.

In the accompanying drawings, Figure 1 is a plan view of book and needle receptacle, showing such parts connected as for use, portions of the book and of the receptacle being in section. Fig. 2, is a side elevation of the parts shown by Fig. 1. Fig. 3, is a vertical section on the line 3—3 of Fig. 1. Fig. 4, is a perspective view of one of the corner pieces of the needle receptacle, showing the same detached. Fig. 5, is a plan view of the needle receptacle. Fig. 6, is a perspective sectional view of a portion of one of the books. Fig. 7, is a plan view of the entire machine. Fig. 8, is a vertical section taken on the line 8—8 of Fig. 7. Fig. 9, is an end elevation. Fig. 10, is a vertical section taken on the line 10—10 of Fig. 7, and Fig. 11, is a vertical section taken on the line 11—11 of Fig. 7.

Referring to the drawings, a supporting frame consisting of side pieces are connected by transverse bars, the sides having longitudinally and horizontally extending recesses or equivalent means for maintaining a reciprocatory carriage, and the side pieces of the frame has bearings for a crankshaft 12, which shaft is provided with a drive and an idle pulleys, cranks or cams on the shaft being engaged by pitmen rods 13, which also engage wrist pins 14, attached to a reciprocatory carriage 15. The carriage 15, may have laterally projecting ledges or strips 16, for engagement recesses or projecting strips of the frame. The construction of the parts being such that the carriage will be maintained and reciprocated in a horizontal plane by relatively short and quick reciprocations. The desired movement of the carriage may be obtained by other means, for instance by cams, springs and impacting means, or other appropriate instrumentalities.

The carriage 15, has on the inner faces of its sides ledges or projecting strips that serve as supports 17, for connected receptacles and books, the supports 17, having at one end inward and vertically extending portions which serve as stops for associated books and receptacles. The ledges or supports do not extend the entire length of the carriage, they being located adjacent to the

ends of the side pieces and spaced to provide for the insertion of books and receptacles on the several supports, the construction being such that a single carriage may maintain a plurality of receptacles and books which are held to move with the carriage and are maintained thereby to be located in vertical series or one above the other, as well as in longitudinal alinement when all the spaces, for the receptacles and books are filled. The side pieces of the carriage are appropriately connected, as by transverse bars 18, which are spaced so as not to interfere with the insertion of the books and receptacles between the supports and upon the ledges. Each of the vertical sections of the carriage have cross-bars 19, attached thereto, the cross-bars having centrally located openings for the passage therethrough of bolts 20, the bolts having at one end horizontally elongated loops 21, and at the other ends threaded portions with which engage winged nuts. The loops of the bolts 20 are adapted to have inserted therethrough vertical locking bars 22, which are also passed through spaces adjacent to the pintles of the books and by engagement with said pintles hold the books and needle receptacles in rigid engagement with the carriage to reciprocate horizontally therewith.

The receptacles 23 in which the needles are placed are made of aluminum, the plane surface thereof upon which a quantity of the needles are placed being perfectly smooth and initially polished, the book attaching end of the receptacles have rigidly attached thereto corner pieces 24, made of harder metal than aluminum, the corner pieces have inward projecting lugs 25, formed integral with the vertical portion, the lugs being spaced to receive between them the leaves or jaws of a book, said lugs having threaded apertures for set screws 26 and 27, the upper set screws 26 having milled heads and the lower set screws carry jamb nuts. The end of the lower set screw 27 in use engages the underside of the lower leaf of a book, to set a spacing bar carried by said leaf in proper alinement with the plane surface of the receptacle in which the needles are placed, and the set screw 26 is for adjusting the upper leaf of the book so that a strip carried thereby may be properly adjusted to the gage or diameter of the needles. The set screw 27 is practically a permanent adjustment for the lower leaf of the book, such leaf carrying the usual serrated gage strip, the set screw 27 being adjusted to position the dales of the serrations in the spacing strip in line with the flat surface of the receptacles for the needles, and the set screw 26 determines the position of a clamping strip usually of wood carried by the other leaf of the book. The leaves of the book are moved away from one another by

5 springs, and are provided with clamping screws for drawing the jaws together, for instance after a book has been filled to hold the needles in place until they have been soldered to a strip of metal, to form a comb.

10 A partial cover 29 of glass, or other transparent material, is provided for each of the needle receptacles 23, the same being secured in a groove 28, the partial cover providing a pocket for needles when the receptacle is stood upon its end with the attached book uppermost, being placed in such position for attaching and adjusting a book, and the partial cover also provides protection

15 against dust and when the receptacle is attached to the carriage and reciprocated protection against atmospheric influences.

20 The receptacle 23 is provided on opposite sides with bosses 31, the outer ends thereof being reduced to form shoulders and studs, clamping bars or members 30 being held in swinging engagement with the studs by screws, as shown. The clamping bars 30, have inward extending end portions with

25 threaded apertures for winged set screws 32 the ends of such screws being tapered to enter countersunk recesses 33, formed in the end butts of the hinge of the book. When a book is placed in position with its leaves between the lugs 25, the screws 32 will hold the book in place and connected to the needle receptacle. The clamping bars are formed with ribs which project to bear against the inner faces of the recesses and the inward extending portions thereof, as shown by Fig. 7, of the drawings.

30 Fig. 6, of the drawings, shows an enlarged detail of a portion of a book, the leaves or jaws 34 and 35 being connected by a pintle-bar 36, the jaw 34 having attached thereto a serrated or grooved gage strip 37, with a projecting portion against which the points of the needles will abut. The opposite jaw 35, which is the upper jaw of the book in use, may have a recess to receive a strip of wood 39, one face overlying the serrated strip 37, the strip 39 projects beyond the inner face of the jaw by which it is carried to frictionally engage with the needles to press

35 them against the serrated gage strip and thus hold them in place when the thumb screws 40 are turned to move the jaw against the action of springs which tend to separate the jaws of the book. When the jaws of the books are adjusted the distance between the strips 39 and the serrated gage strips 37 will be less than the diameter of the butts of the needles so that the needles can only enter the serrations point first.

40 When the length of a comb is less than the width of a book I use either one or two filling pieces 41, such filling pieces being placed in the receptacle to rest upon the plane surface thereof, and to be partially overlaid by the cover plate, the ends of the

filling piece abutting against the book and the opposite wall of the receptacle, an edge of the strip bearing against the inner side wall of the receptacle in which the needles are placed.

70 The construction of the parts may be modified, and any appropriate means may be used to give proper reciprocatory movement to the carriage, the carriage showing two vertical banks of spaces and supports for connected books and needle receptacles, so that a plurality of books may be filled simultaneously. As the receptacles or trays are partially covered there will be but little waste or loss of the needles, and in use such fillers that are not filled may remain on the carriage, many other advantages incident to the construction illustrated will be obvious to those skilled in the art of making combs for combing machines.

85 The needles for half laps and top combs of combing machines used to parallel the slivers of the staples are of steel and have a high polish, the butt ends are cylindrical and taper somewhat convexedly to the point, thus the needles lie on a plane surface with their points slightly raised, the butts overbalancing the points, and the straight ends of the butts offer a greater resistance to the air than the points. If the surface upon which the needles rest inclined toward the book the tendency would be to gravitate toward the comb with the butt ends towards the same, and mass in front of the book.

90 I have also noted that the needles tend to form a mass and cohere when the surface upon which they rest is of iron or steel, particularly when they are agitated by quick reciprocations of the receptacle in which they are placed, possibly by being magnetized, this objection is overcome in my improvement by providing a non-magnetic surface, preferably aluminum, with my construction the needles travel in the directions of the reciprocations with the points forward, to-wit:—toward the book and in an opposite direction, moving step by step upon the smooth, greasy aluminum surface, the step by step movement or travel of the needles may be caused by air operating with greater effective pressure against the flat or butt ends of the needles than the pointed ends. In practice a quantity of the needles which reach the opposite end of the receptacle from the book, by contact with the wall of the receptacle mass there and many of them turn and then travel in an opposite direction toward the book, so that the pointed ends will enter the serrations in the gage plate or strip. In case a book is not fully filled, the filling may be completed by hand at the soldering table.

I claim,

1. A machine for placing comb-points between the jaws of a book, comprising a re-

ceptacle for comb-points having a plane surface and an open end, a book removably attached to the open end of the receptacle, the receptacle being maintained in a true horizontal position as to its plane surface and means for reciprocating the receptacle and comb-points placed upon its plane horizontal surface; operating to effect travel of the comb-points in the direction of the reciprocations of the receptacle with their points forward in the direction of their travel, whereby pointed ends of the comb-points will enter between the jaws of a book attached to the receptacle.

2. In a book filling machine, a horizontally maintained and reciprocatory needle receptacle having an open end, corner pieces with inward extending lugs, clamping bars attached to the receptacle, adjustable means carried by the clamping bars to engage with a book to hold the same when placed between the lugs in removable engagement with the receptacle.

3. In a book filling machine, an open ended and horizontally maintained receptacle for needles, a partial cover which terminates beyond the open end of the receptacle, means attached to the receptacle for connecting a book to its open end, and means for attaching the connected book and receptacle to a horizontally reciprocatory carriage.

4. In a book filling machine, the combination with a supporting frame and a horizontally reciprocatory tray carrier maintained in sliding engagement with the frame, of a tray having a plane smooth surface, upstanding sides and one upstanding end wall, of a book detachably secured to the tray and means for reciprocating horizontally the carriage and the tray carried thereby; whereby a quantity of comb-points placed in the tray will individually be caused to travel in the direction of the reciprocations with their pointed ends positioned in the direction of their travel.

5. A book filling machine comprising a horizontally maintained needle receptacle having a surface of aluminum upon which comb needles are placed, means for reciprocating the needle receptacle to effect travel of the comb needles with their points positioned in the same direction as the direction of the reciprocations of the needle receptacle.

6. A machine for inserting comb-points between the jaws of a book, comprising a receptacle for a quantity of ferrous comb-points said receptacle being non-magnetic as to static electricity, means for maintaining the receptacle in a true horizontal position as to its surface which maintains the comb-points, means for reciprocating the receptacle longitudinally, a book associated with an open end of the receptacle to receive the pointed ends of the comb-points, the horizontal reciprocatory movement of the recep-

tacle causing the comb-points to individually travel upon the horizontal surface of the receptacle during its reciprocations with their points forward in the direction of the reciprocations.

7. A machine for placing comb needles in books, comprising a horizontally maintained needle receptacle, a book removably attached to the receptacle, a partial cover for the receptacle which terminates beyond the open end of the receptacle to which the book is attached, means for maintaining and means for reciprocating the receptacle, the reciprocations and horizontal maintenance of the receptacle effecting travel of the needles with their points forward in the direction of the reciprocations and when arrested by the closed end of the receptacle a change in the direction of the travel of the needles.

8. A machine for inserting the pointed ends of comb-needles between the jaws of a book, comprising a tray for comb-needles having an open end and a closed end upon which the tray may be stood and maintained in an upright position, a book with separable jaws, means for detachably connecting the book to the open end of the tray, and a transparent partial cover for the tray which extends from one end thereof and terminates beyond the end to which the book is attached.

9. A machine for entering the points of comb-needles between the jaws of books comprising a plurality of horizontally maintained trays for a quantity of comb-needles, a main supporting frame, a pair of side frames maintained in reciprocal engagement with the main supporting frame, means for connecting a plurality of trays so that they will be maintained to move with and to be in removable engagement with the side frames, books associated with the trays, and means for reciprocating the side frames which carry trays and books maintained thereby.

10. A machine for entering the points of metallic comb-needles between the jaws of a book, comprising a tray of non-magnetic material having a plane surface, a partial cover of transparent material associated with the tray and maintained above its plane surface, a book maintained in engagement with one end of the tray, means for maintaining the tray so that its plane surface will be in true horizontal position, and means for imparting a reciprocatory movement to the tray; whereby, comb-needles placed in the tray will move point forward upon the surface of the tray in the direction of the reciprocations imparted thereto.

11. A machine for placing the pointed ends of comb-needles between the jaws of a book, comprising in combination a supporting frame, a tray of non-magnetic material having a plane surface and upstanding mar-

gins on three sides of the tray, a partial
cover for the tray, a book, means for asso-
ciating the book with the open end of the
tray, means for maintaining the tray in
horizontal reciprocatory engagement with
the supporting frame, the reciprocations of
the tray being longitudinal and horizontal;

the structure and actuation thereof effect-
ing travel of ferrous metallic comb-needles
placed upon the tray in the direction of the
reciprocations and mainly with the points
positioned in the direction of their travel.

JOSE P. CORREIA.