Feb. 12, 1924. 1,483,713

A. BOURGEOIS

TRANSFORMATION MAKING MACHINE

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Fig. 1.

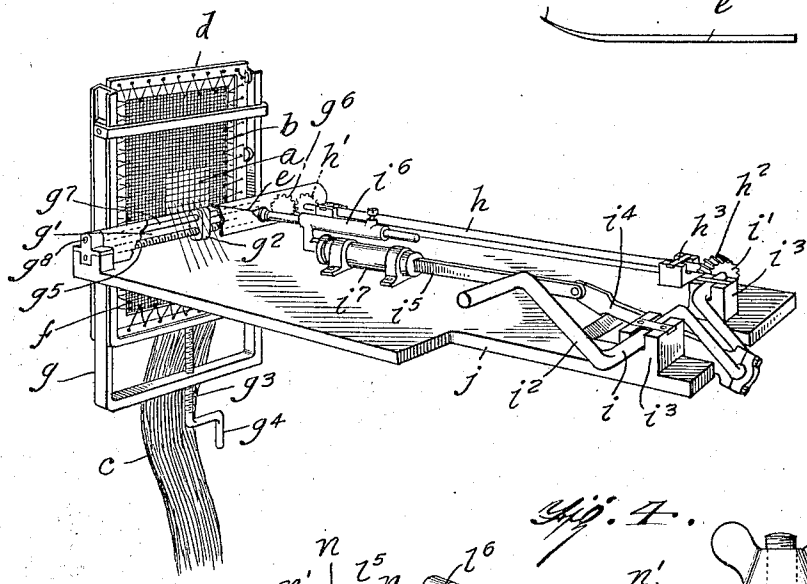


Fig. 5.

Fig. 2.

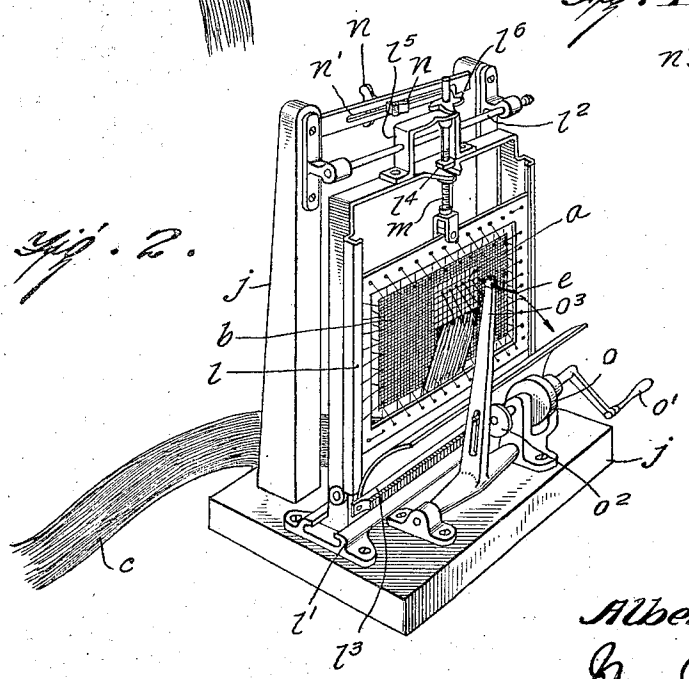
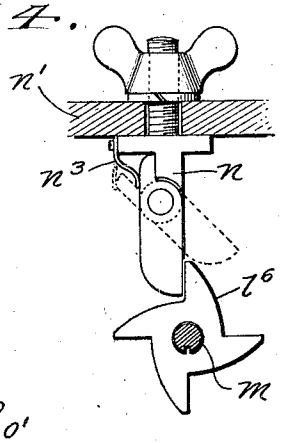


Fig. 4.



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Fig. 6.

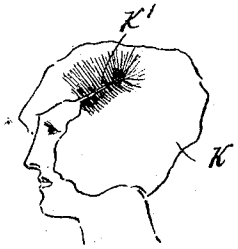
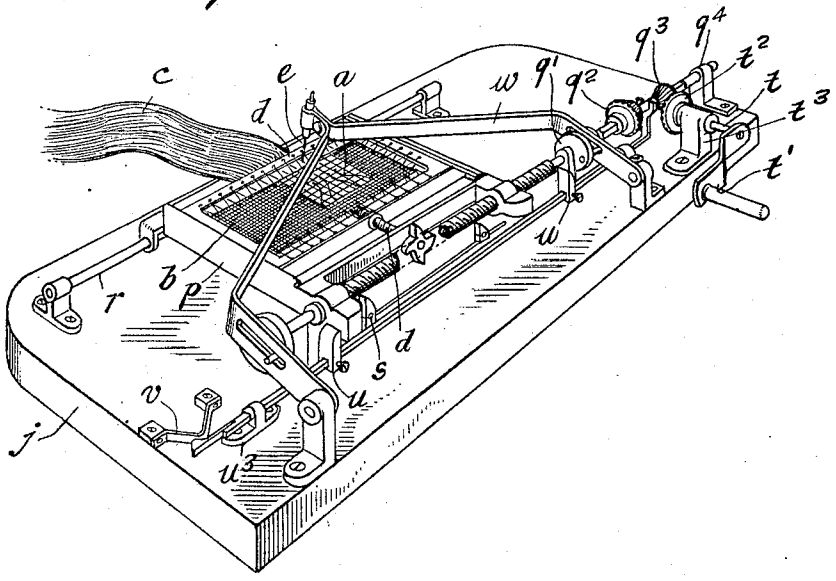


Fig. 3.



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UNITED STATES PATENT OFFICE.

ALBERT BOURGEOIS, OF PARIS, FRANCE.

TRANSFORMATION-MAKING MACHINE.

Application filed October 11, 1921. Serial No. 507,129.

To all whom it may concern:

Be it known that I, ALBERT BOURGEOIS, a citizen of the Republic of France, residing at 1 Boulevard de Courcelles, Paris, France, have invented certain new and useful Improvements in Transformation-Making Machines, of which the following is a specification.

My invention relates to improvements in devices for disengaging from bundles formed therewith any filiform bodies, and especially hair, in view of making "transformations" with them. The said improvements consist mainly in the fact of providing for the use of a hook so constructed that when sunk into the bundle of filiform bodies, it will, on being withdrawn, draw one of them out, movements of the said hook being automatically actuated, while a frame is used that supports the said bundle and a piece of tulle by means of a silk gauze to which the filiform bodies are to be tied, such frame being suitably actuated to ensure that the hair drawn will form rows.

Another object of my invention is to provide certain means or methods of construction and utilization of the aforesaid device.

Hereinafter my invention is described, in reference to the appended drawings diagrammatically to show, as instances, three embodiments of the same as applied to a device more particularly used for drawing out of a bundle made therewith hair one by one to achieve "transformations."

In the aforementioned drawings, Figures 1, 2 and 3, are views in perspective of a hair drawing device or machine constructed according to the three methods of performing my invention.

Fig. 4 is an elevation, partly a section, of a detail shown in Fig. 1.

Fig. 5 is an elevation of a detail of Figs. 1, 2 and 3.

Fig. 6 is an elevation of a head coifed with such a "transformation" as can be achieved by means of the herein and hereby described, shown and illustrated device.

Within a frame d is stretched a piece of tulle b against which is sewn, along the edges thereof, a piece of silk gauze a.

Frame d is designed in such a way as to slide in a member f itself adapted to slide in a member of frame g.

A threaded rod g^3 has one of its ends provided with a crank g^4 screwed into a hole tapped in member g and is kept in member f, and moves the latter one millimeter per crank g^4 revolution.

A cross piece g^1 of member g has, in its middle, a fixed nut g^2, by means of which the complete frame is connected with a tablet of framework j so as to be adapted to be moved by the rotating of worm g^5 and be guided by rod g^7 sliding in nut g^2.

Worm g^5 and rod g^7 are hubbed in bearings g^8 secured on tablet g.

A crank shaft i, hubbed in bearings i^3 and actuated by crank i^2 drives, on the one hand, by means of pinions i^1, h^2, h^1, g^6 and of rod h, rotating in bearings h^3, the worm g^5, which carries pinion g^6, and on the other hand, by means of its elbow and the intermediary of connecting rod i^4 and rod i^5 moving in a fixed guide i^7, an adjustable support or bracket i^6 for a draw-hook e.

A lock of hair c to be treated, is applied, by its cut end, against the silk gauze piece and held by means of a piece of paper or, say, rubber sewn on the tulle.

The tulle has meshes any two of which are at the same implanting distance as on the head-skin two adjacent hairs, i. e. about a millimeter.

Point e^1 of the drawing hook is bent in such a way as to draw out one hair when pulled out from the lock after stabbing.

The working of the device is as follows:

When crank i^2 is revolved, threaded rod g^5 drags, translating by means of nut g^2, member g and thereby the set of frame, while, for the first half revolution of the said crank, the point or hook e is moved perpendicularly into the lock of hair.

During the second half revolution of the said crank, hook e is brought to its initial position, drawing out a hair, while the set of hair continues its own translation.

Shooting forth again, the hook disengages from the drawn hair, which is held by the meshes of frame d.

A row of hair is thus obtained and, in order to get a second one, the crank g^4 is

turned one revolution, moving thereby frame f vertically along its slides g; the crank i^2 is then revolved in the opposite direction and so on, until a predetermined portion of the surface of the tulle is garnished with hair, and especially the portion upon which the gauze is sewn will have an implantation most similar to the natural one on the skin of the head.

This operation once done, the drawn ends of the hair are tied on the tulle b, which can then be removed from frame d and a transformation k is achieved having an invisible parting on gauze a as represented by Fig. 6.

Fig. 2 is a method of constructing the same machine but in a modified way; so as to allow frame d to be moved automatically when passing from one row of drawn hair to the next row of hair to be drawn if desired.

Frame d is, in this case, set as in the previous one.

A member l adapted to serve as a slide for frame d; slides in suitably formed slides i^1, integral with the frame, and, if necessary, along the rod of stem l^2 parallel to the axis of the said slides l^1. It may also be made integral with frame projections j^1 and be provided with a rack secured to it and arranged parallel to the axis of slides l^1.

Two tappets n are removably put in a slide or groove arranged in a cross-piece n^1 made integral with projection j^1 parallelly to frame d, each of the said tappets having to it linked a finger n^2 adapted to thrust in the position shown by solid lines at Fig. 4, against the body of the tappet, and each tappet is provided with an antagonistic spring n^3, preferably just sufficient to keep it in this position. The tappets are so arranged that when sliding member l is near the end of its travel in either direction, an arm of a cam l^6 will strike against finger n^2 of one of the tappets and keep it in thrust position.

The said arm is therefore and thereby permitted to rotate one fourth of a revolution, and, consequently to cause threaded rod m to be revolved, which, moving in the tapped portion l^4, moves frame d one millimeter.

When member l comes back, the next arm of cam l^6 meets the same finger n^2 and the latter, reclining as shown by dots and dashes at Figure 4, does not retain the cam any more. This arrangement allows frame d to be moved one millimeter in the same direction every time one of cam l^6 arms meets with and strikes against a finger n^2.

A worm o, adapted to mesh with rack l^3, is positioned on an axle carrying at one of its ends a crank o^1, and, at its other end, a crank plate o^2.

A rocking lever o^3 carries on one of its ends an adjustable support from the draw-hook e and has, intermediate to its ends, a slot adapted to allow the crank table stud o^2 to slide.

It will be apparent therefore, that, by revolving the crank o^1 half a turn, the point of the draw-hook is caused to sink, stab or penetrate, into the lock or bundle of hair, and that the next half turn or revolution of the same crank causes it to come back.

Figure 3 illustrates another method of performing the device, which method permits automatic action of the draw hook and of frame d to be achieved.

In this case also, frame d is fitted as previously.

A member p, adapted to serve as slide for the same frame d, and itself to slide along a rod r, is traversed by the threaded part of a screw or worm q, parallel to rod r.

A threaded rod d^1, having the same purpose as threaded rod m in the device shown by Figure 2, is provided, as the latter, with a four-armed cam d^2, similar to the one of l^6 of the said device, the said member d^2 being actuated by tappets s, also like the n ones.

Screw or worm q is provided with a system of crank plates q^1 and carries a sliding sleeve integral with two toothed pinions q^2, q^3.

An axle t, hubbed in a bearing t^3 has, at one of its ends, a crank t^1 and at its other end, a bevel pinion t^3 adapted to mesh with one of the pinions q^2, q^3.

Two tappets u can be fixed, variably spaced from one another, on a spindle u^1 connected by a fork or yoke to the sleeve and sliding by long pins in the guiding members u^2 secured to the frame.

During the rotation of crank t^1, member p, reaching the end of its travel, drags, by means of one of the tappets s, the spindle u^1 and therefore and thereby the sleeve which will cause the other pinion to come into mesh with pinion t^2.

In order to ensure a proper meshing of the two pinions, a spring v, for instance, may be set on the frame and a projection u^3 provided on spindle u^1 in order that whenever the sleeve has to be moved in one or the other direction, the projection will come against the spring, compress it, and having gone beyond, will receive from it a sufficient impulse to ensure the required motion of the said sleeve.

A double lever w is set in a way similar to the one of lever o^3 as shown by Fig. 2, that is to say, is also a rocking one, and provided with a support for the draw-hook and with slots adapted to give a sliding to the studs of the crank plates q^1.

Obviously, I do not intend to limit my invention to the particular embodiment hereby described, it being understood that a plurality of modifications and variations may be done, introduced, or applied, without in

any way departing from the spirit and principle thereof.

Having now particularly described and ascertained the nature of my said invention and the way in which the same is to be performed, I declare that what I claim is:—

1. A machine of the class described, comprising a table, a frame mounted thereon for retrograde movement, a work carrying member slidable in the frame, means carried by the frame automatically producing a step by step movement thereof actuated at the end of each stroke of the frame, a screw connection with the frame, means for rotating the screw, means for automatically changing the direction of rotation of the screw for producing the retrograde movement of the frame, a needle mounted for reciprocating movement on the table, and means for reciprocating the needle to operate on the work in the member.

2. A machine of the class described, including a table, a frame slidably mounted thereon, a work carrying member slidable in the frame, a piece of sheet material stretched on the work carrying member, a piece of sheet material of a different character than the first mentioned secured to said first-mentioned sheet, a needle mounted for reciprocating movement on the table for operating on the sheet materials, and operating means for the frame, the member, and the needle, whereby the entire surface of the sheets in the frame may be operated on by the needle and the second-mentioned sheet material reinforces the first-mentioned.

3. A machine of the class described, comprising a table, a frame mounted on the table for reciprocating movement, a work carrying member slidable in the frame, a feed screw mounted for rotation in the frame and work carrying member for moving said work carrying member in the frame, a ratchet wheel mounted on the feed screw, a needle having a reciprocating movement to operate on the work in the member, means for reciprocating the frame, and a pair of blocks adjustably mounted on the frame for engagement with said ratchet wheel for rotating the screw and imparting a step by step movement to the work carrying member at the end of each stroke of the frame.

4. A machine of the class described, comprising a table, a frame mounted thereon for reciprocating movement, a work carrier mounted in the frame, a needle for operating on the work in the carrier, a screw member rotatably mounted on the table having threaded connection with the frame, a source of power for rotating said screw member, a reversible clutch connection between said source of power and the screw member, and means operated by the frame for operating the clutch to produce the reciprocating movement of the frame.

5. A machine of the class described, comprising a table, a frame mounted thereon for reciprocating movement, a work carrier mounted in the frame, a needle for operating on the work in the carrier, a screw member rotatably mounted on the table having threaded connection with the frame, a source of power for rotating said screw member, a reversible clutch connection between said source of power and the screw member, a rod slidably mounted on the table connected with the clutch for operating the same, and blocks adjustably mounted on the rod and engaged by the frame for operating the clutch to reverse the movement of the frame and screw member.

6. A machine of the class described, comprising a table, a frame mounted thereon for reciprocating movement, a work carrier mounted in the frame, a needle for operating on the work in the carrier, a screw member rotatably mounted on the table having threaded connection with the frame, a source of power for rotating said screw member, a reversible clutch connection between said source of power and the screw member, a rod slidably mounted on the table connected with the clutch for operating the same in its sliding movement, blocks adjustably mounted on the rod adapted to be engaged by the frame at the end of its stroke of movement for disconnecting the clutch from the power, said rod having cam surfaces formed thereon, and resilient means for cooperation with the cam surfaces to move the clutch after disengagement to reengage and reverse the motion of the screw member.

In testimony whereof I affixed my signature.

ALBERT BOURGEOIS.