No. 887,477. PATENTED MAY 12, 1908.

K. HELLVOIGT.

SEWING MACHINE FOR OVEREDGE STITCHING.

APPLICATION FILED JUNE 4, 1907.

12 SHEETS—SHEET 1.

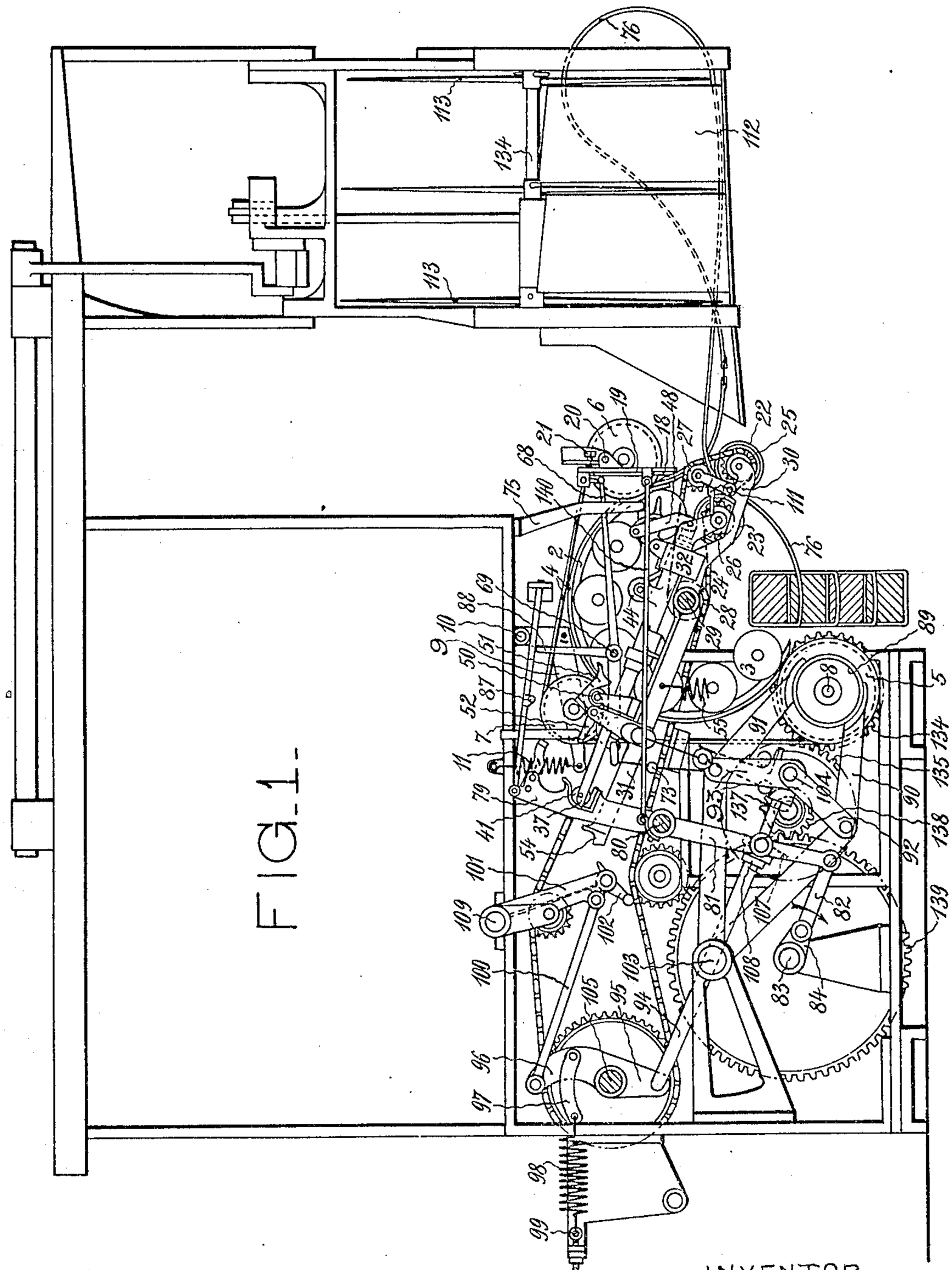


FIG. 1.

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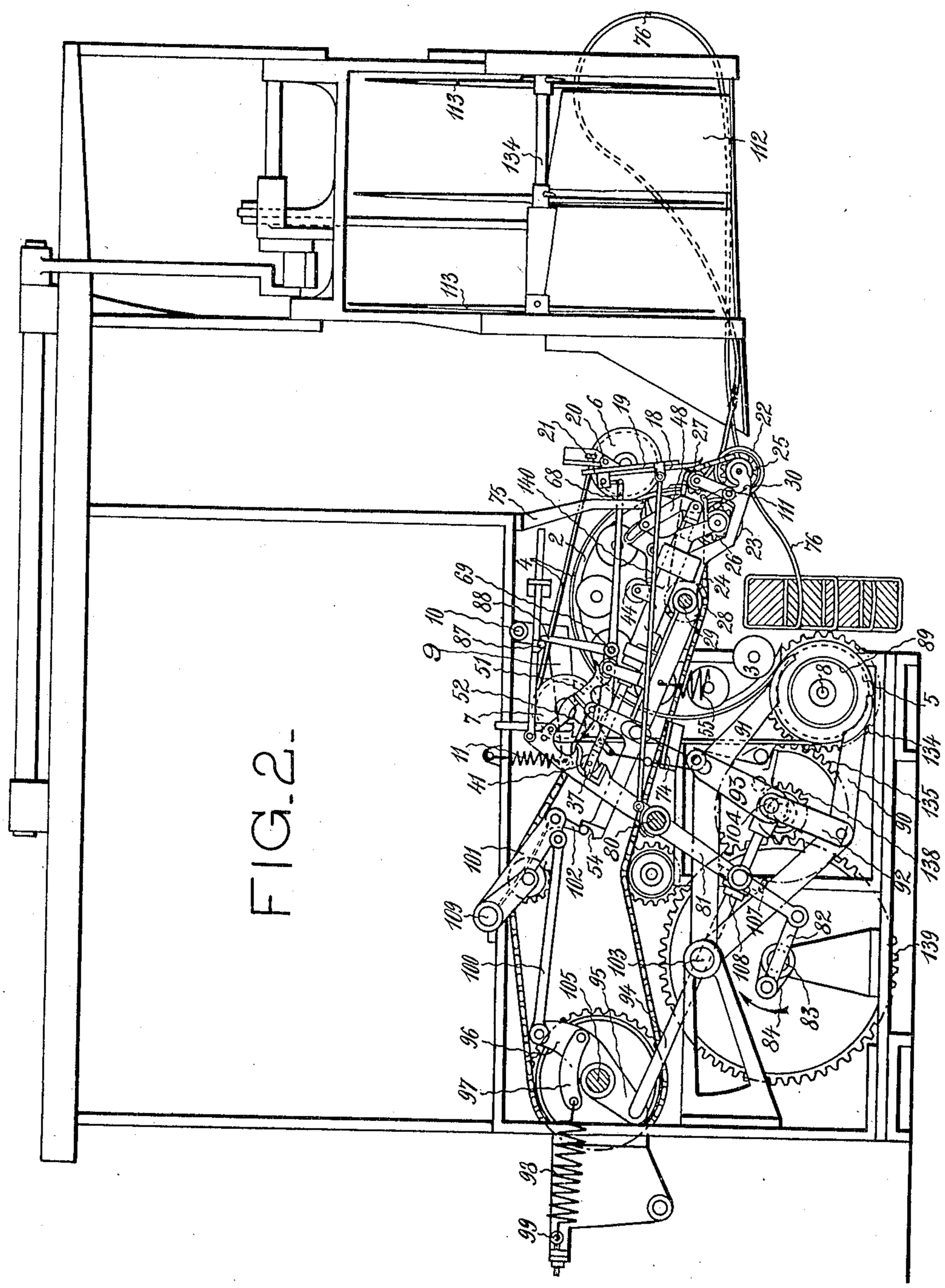


FIG. 2.

WITNESSES;

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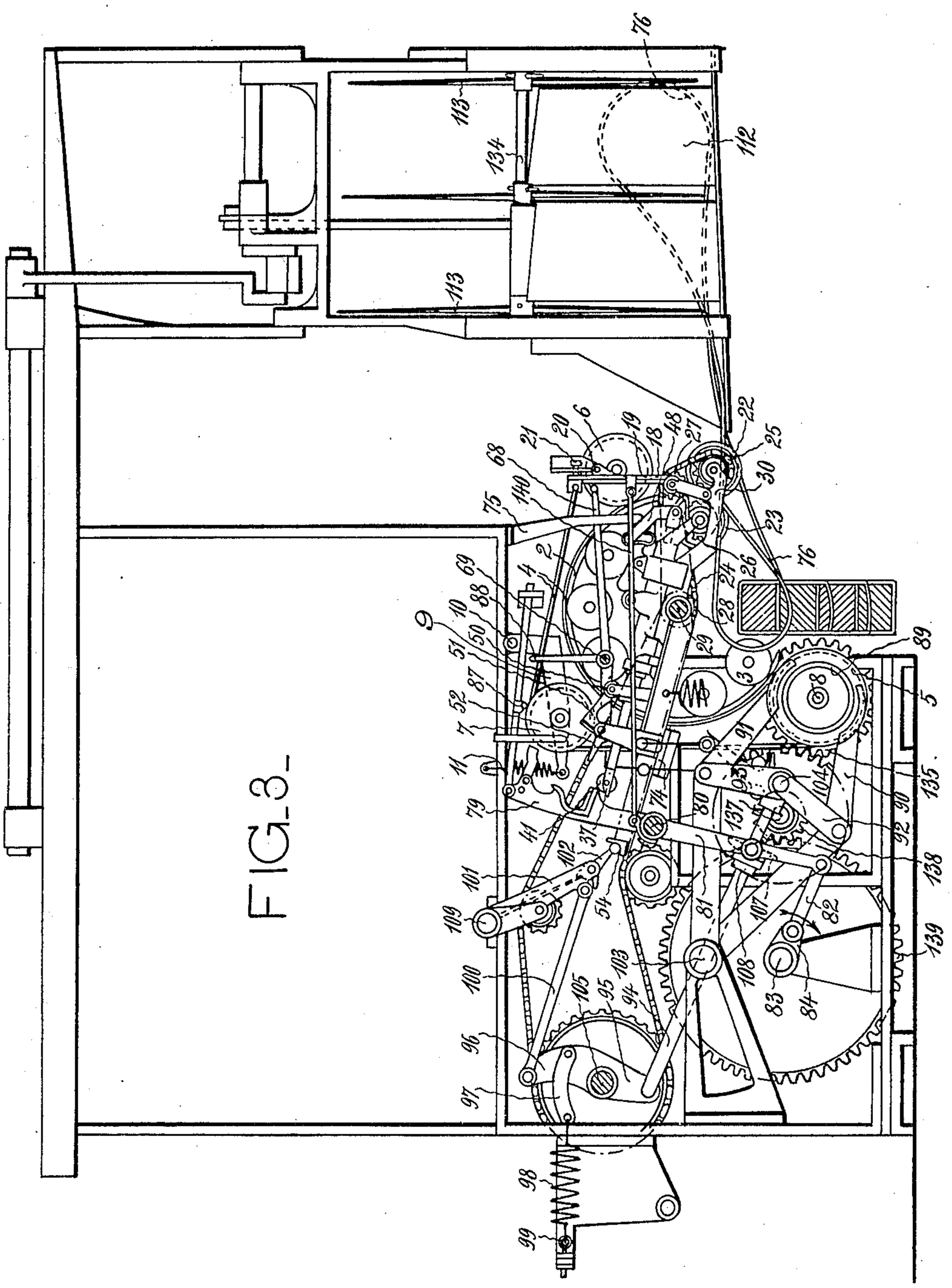


FIG. 3.

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12 SHEETS—SHEET 4.

FIG. 4.

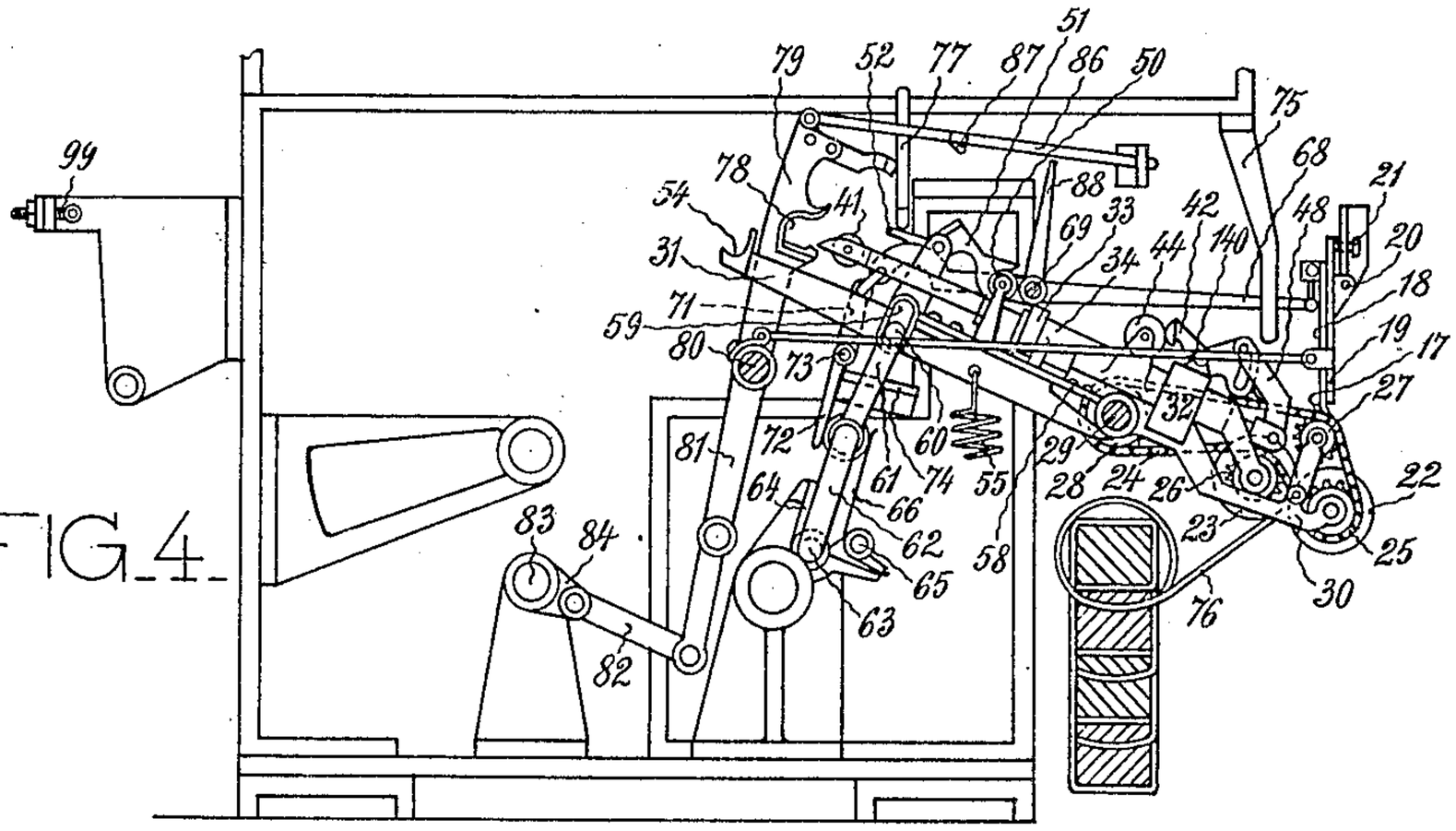



FIG. 5.

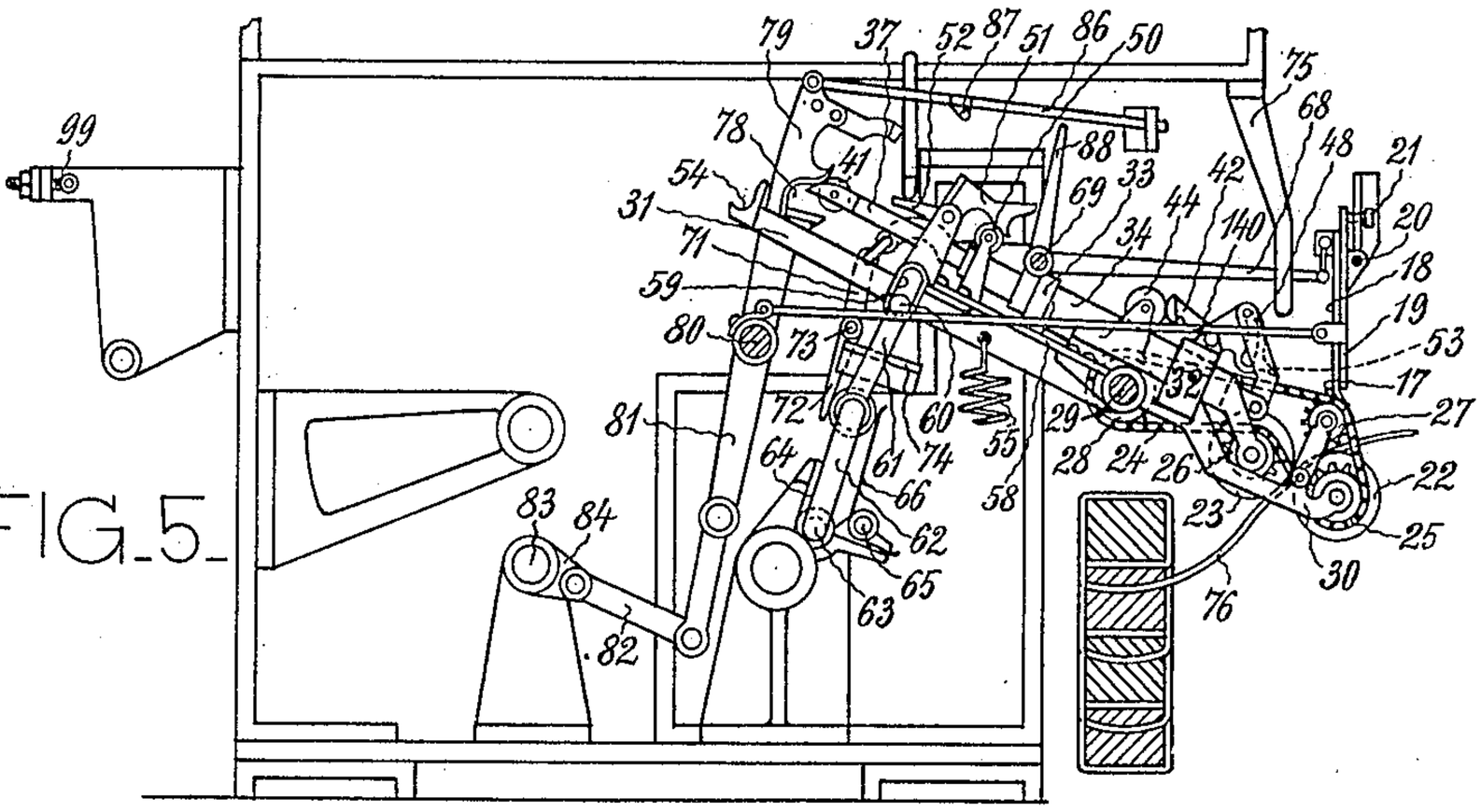
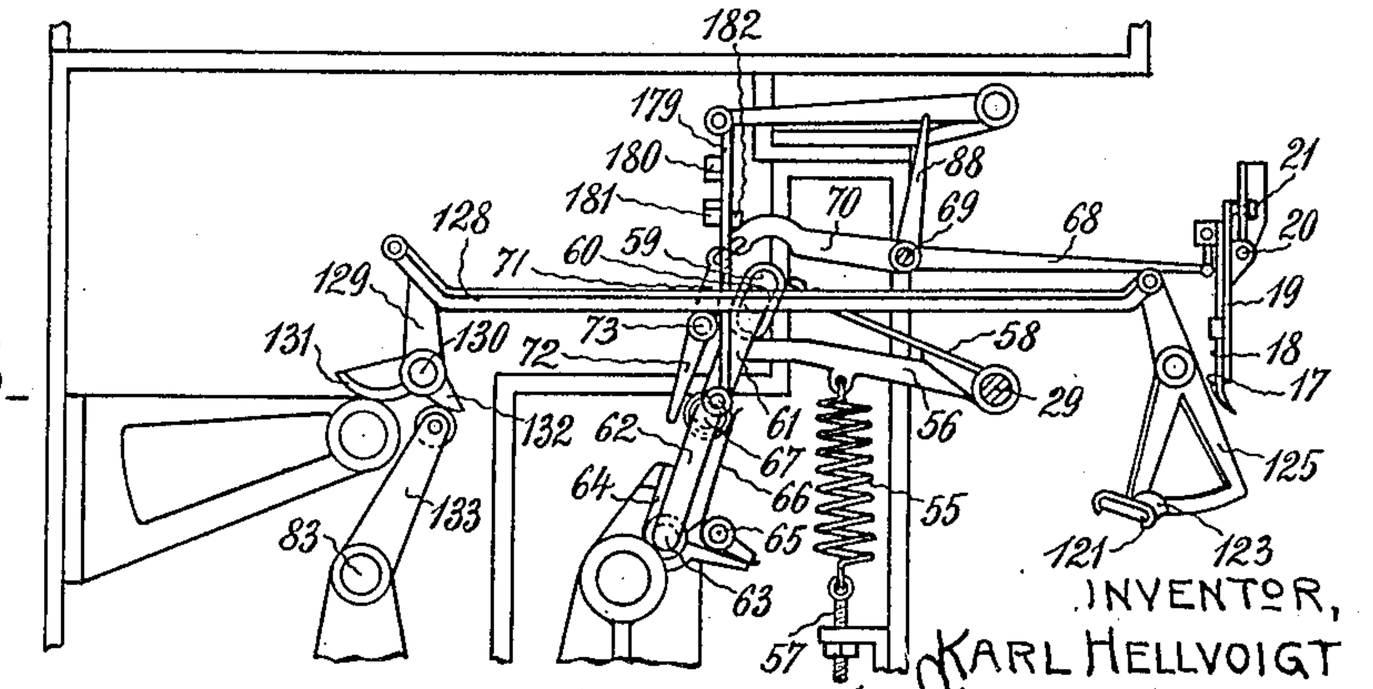



FIG. 6.

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12 SHEETS—SHEET 5.

FIG_8_

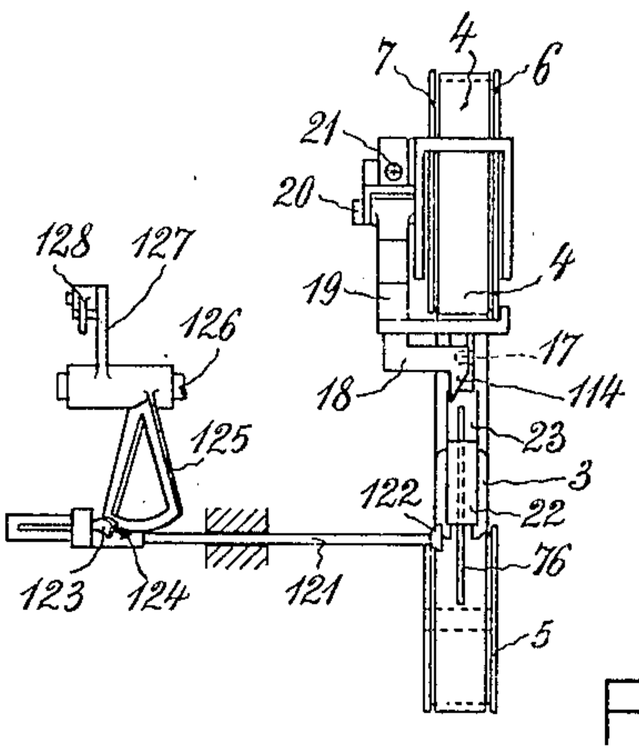



FIG_7_

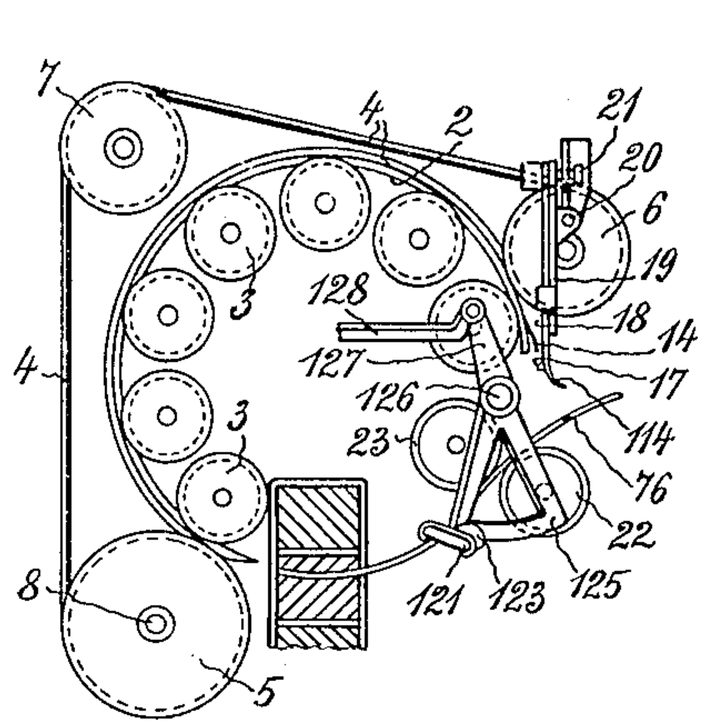



FIG_9_

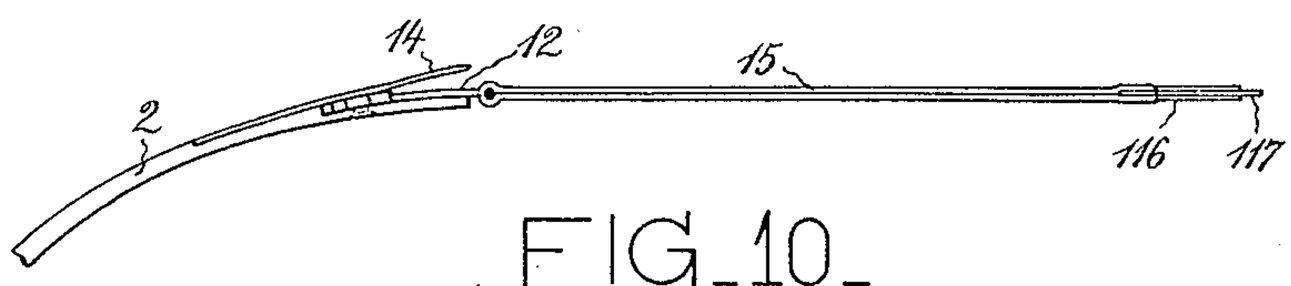



FIG_10_

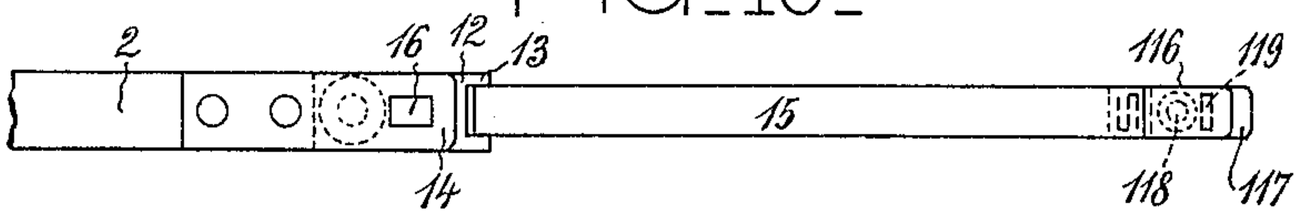



FIG_11_

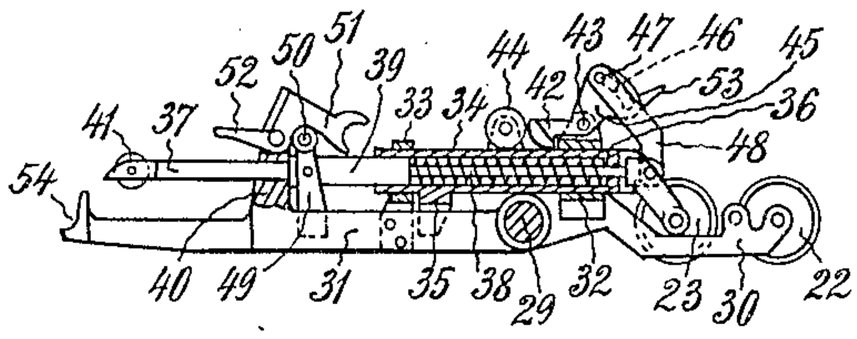
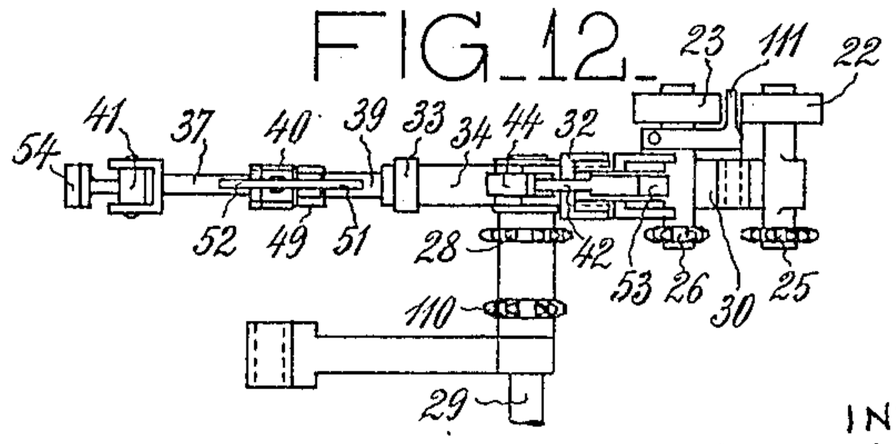



FIG_12_

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K. HELLVOIGT.

# SEWING MACHINE FOR OVEREDGE STITCHING.

APPLICATION FILED JUNE 4, 1907.

12 SHEETS—SHEET 6.

FIG. 13.

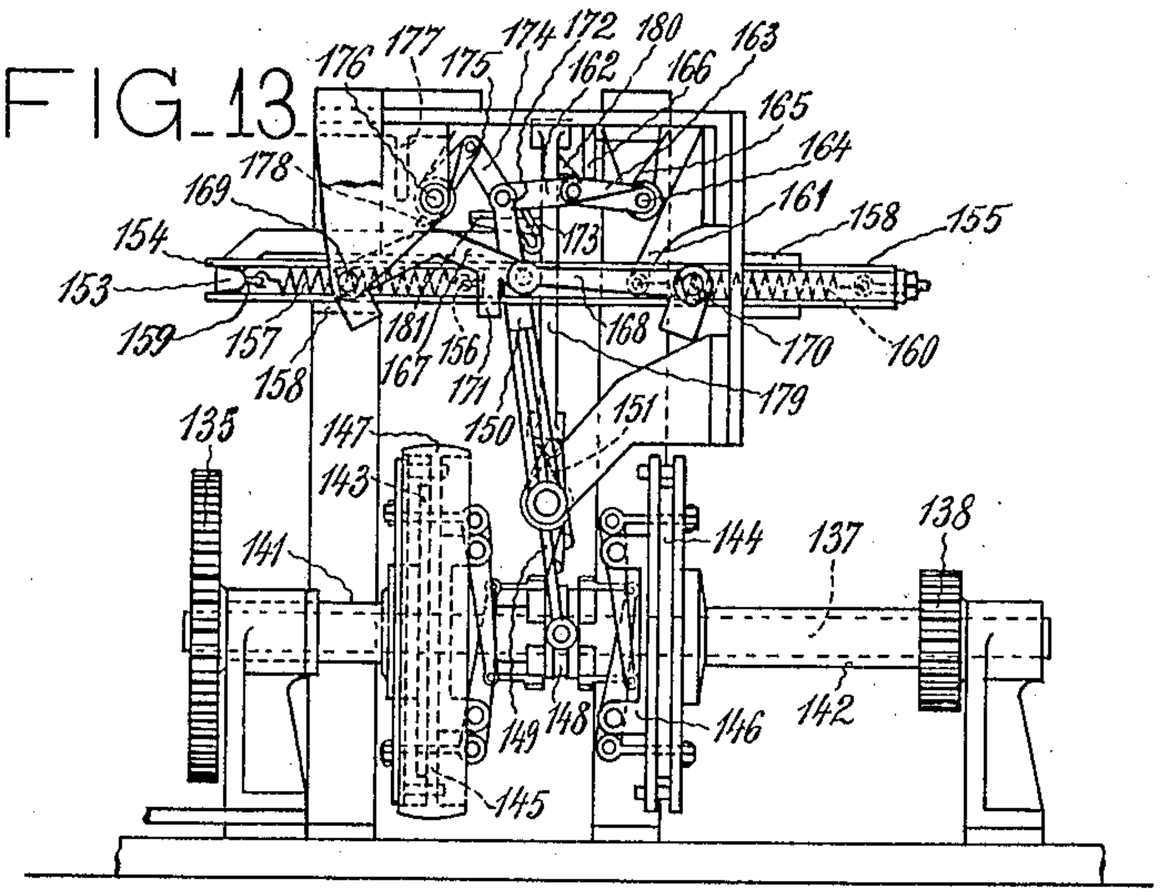



FIG. 14.

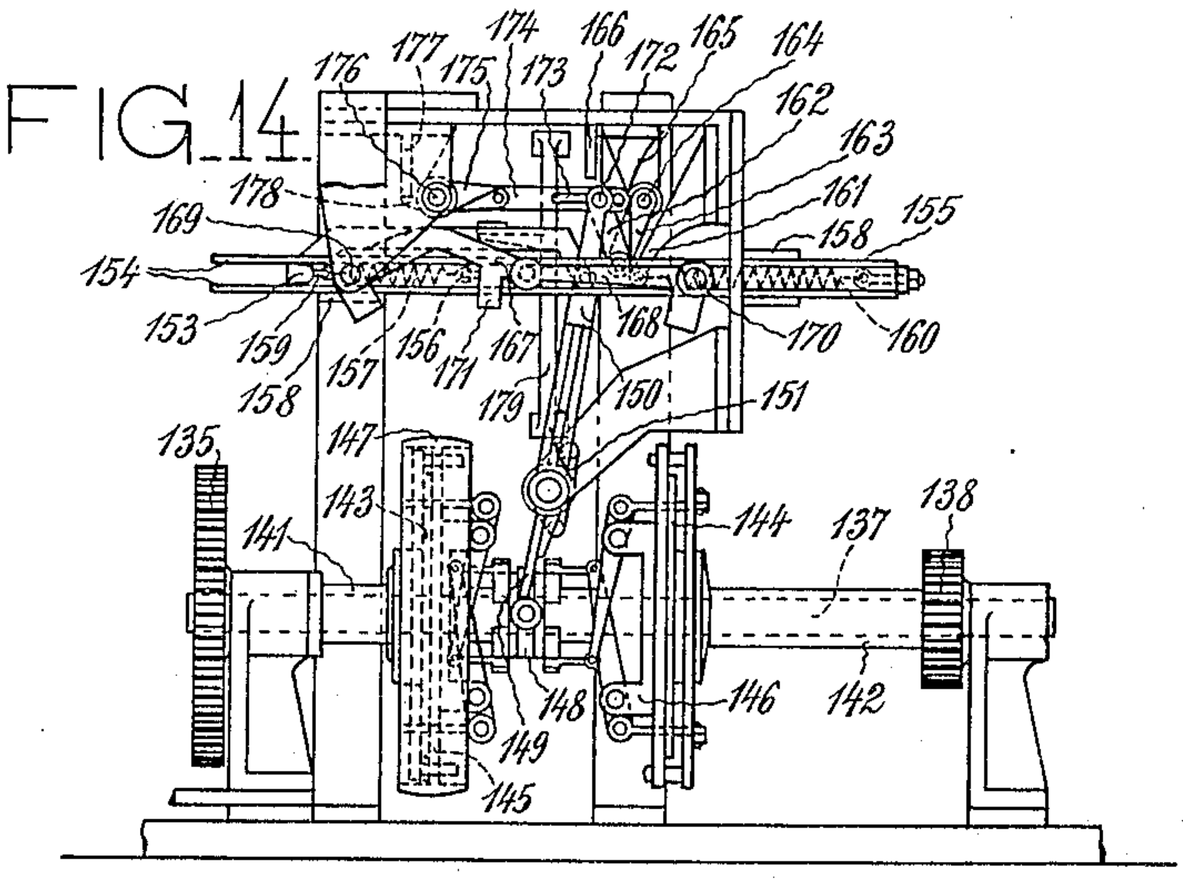
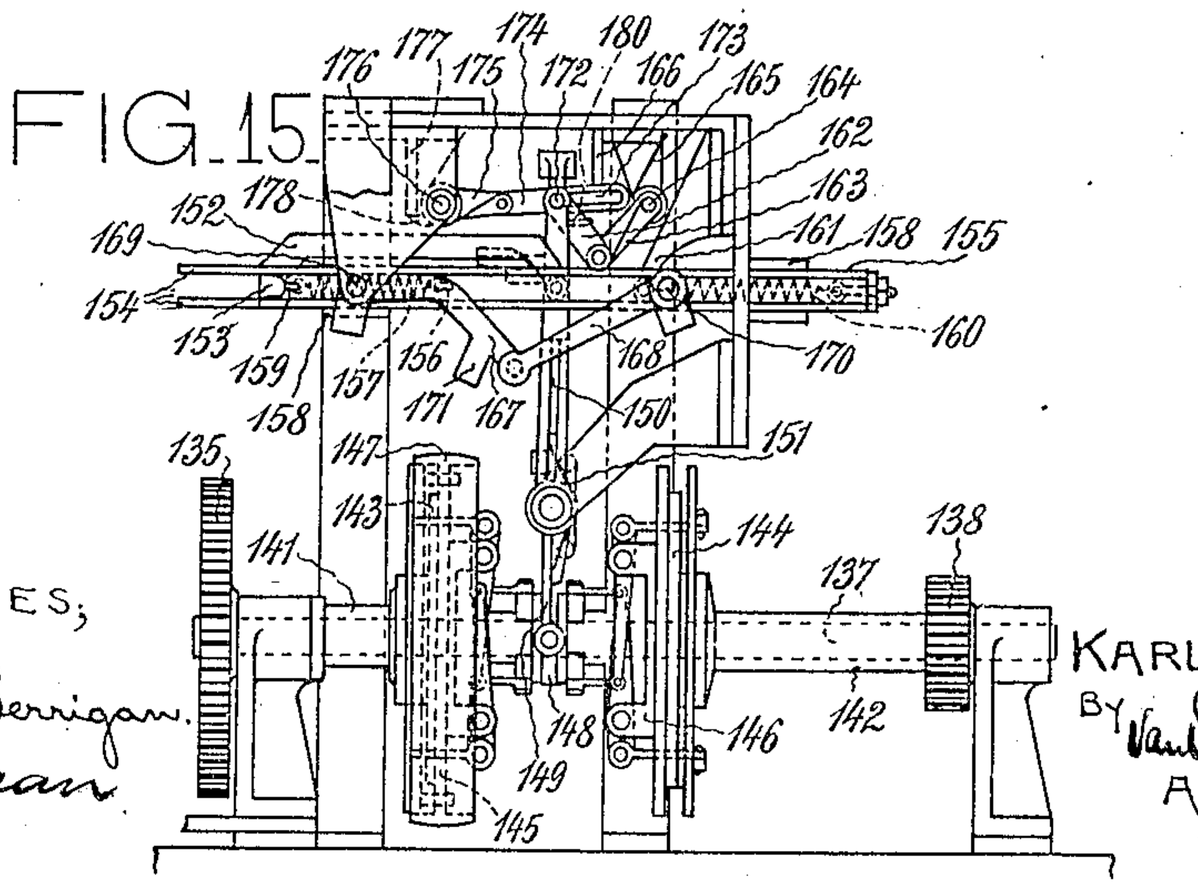



FIG. 15.

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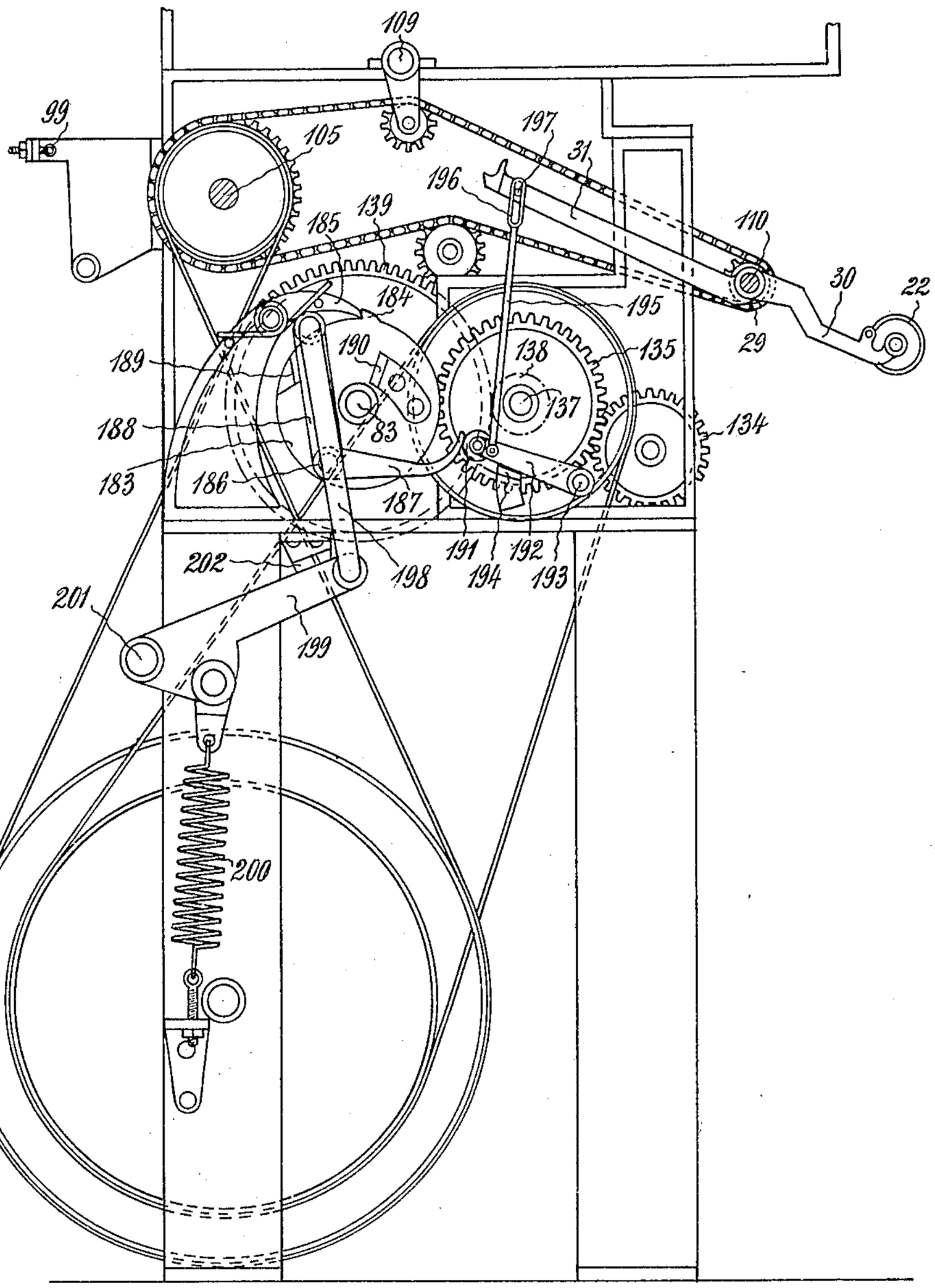
APPLICATION FILED JUNE 4, 1907.

12 SHEETS—SHEET 7.

FIG. 16.

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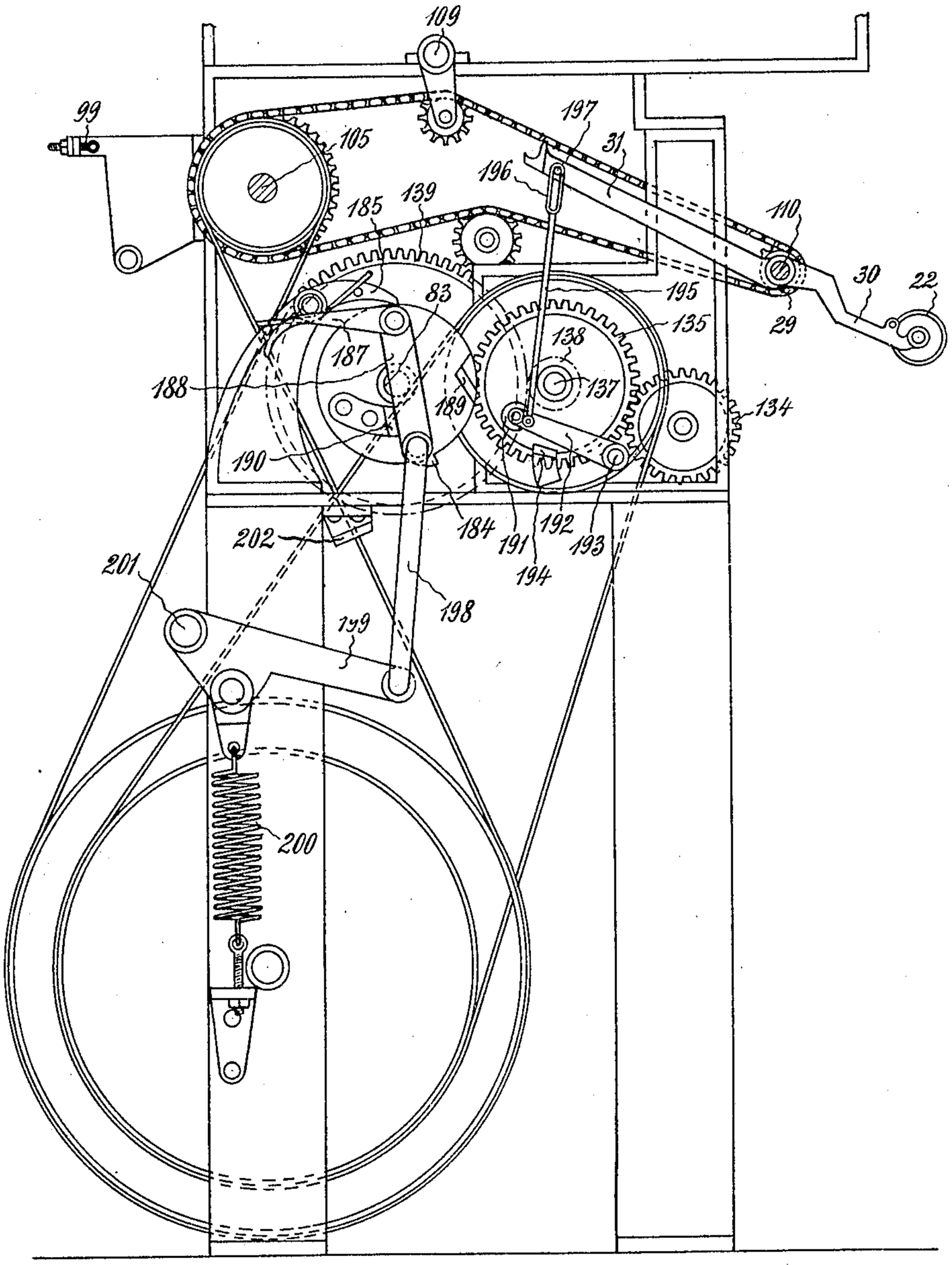
12 SHEETS—SHEET 8.

FIG. 17.

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12 SHEETS—SHEET 9.

FIG. 19.

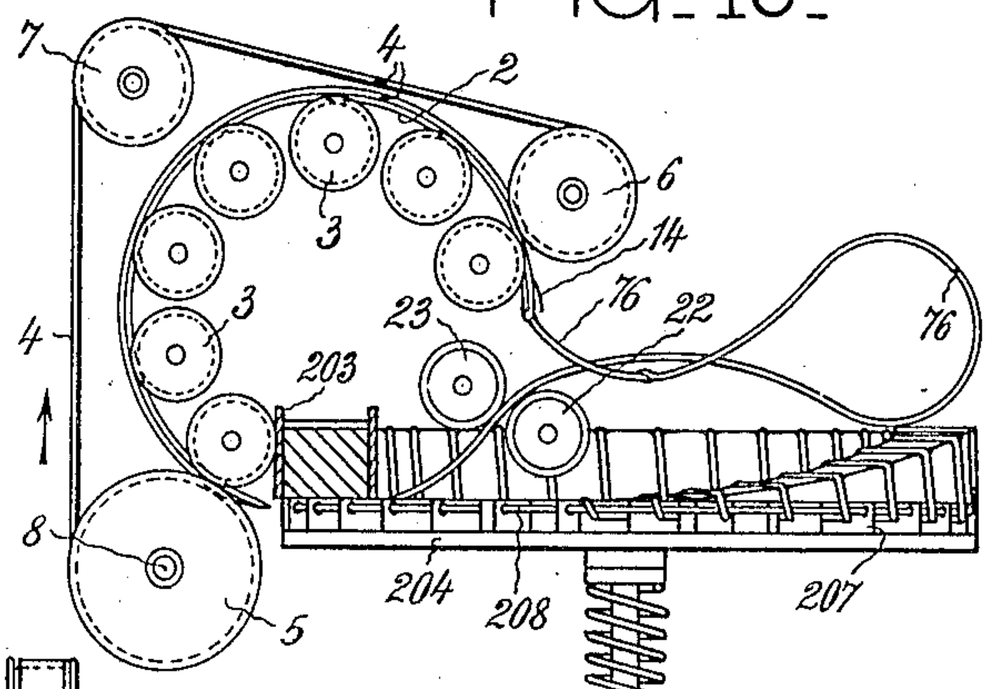
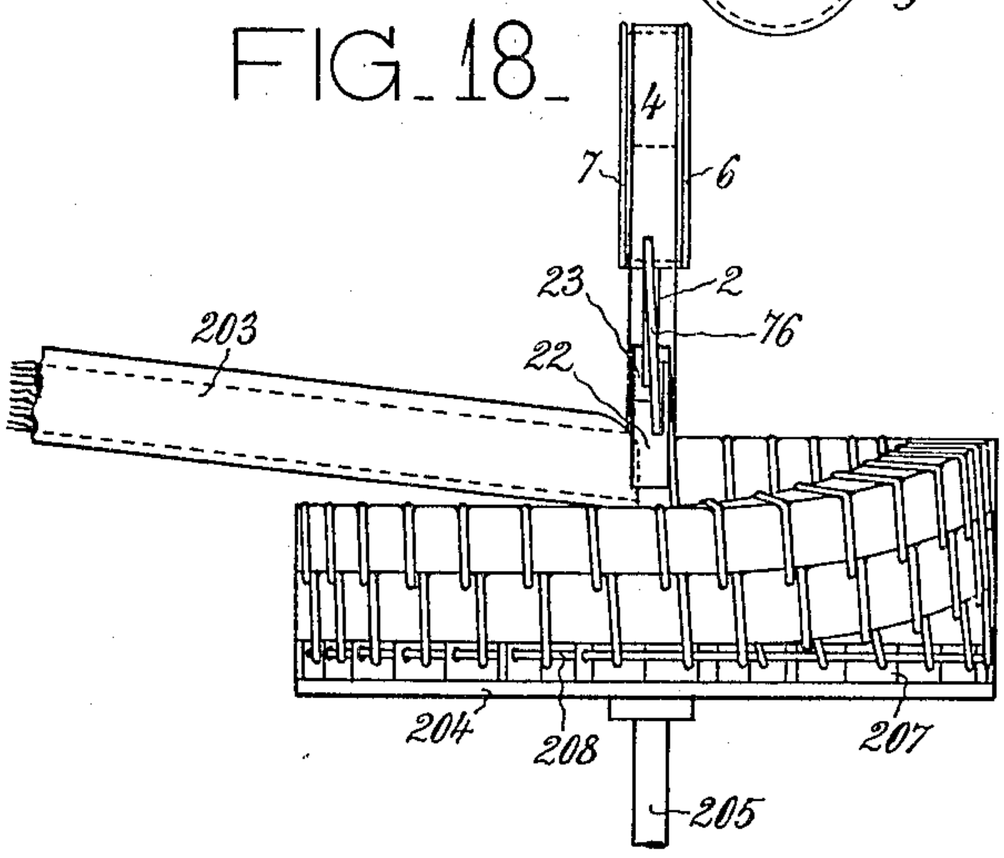



FIG. 18.



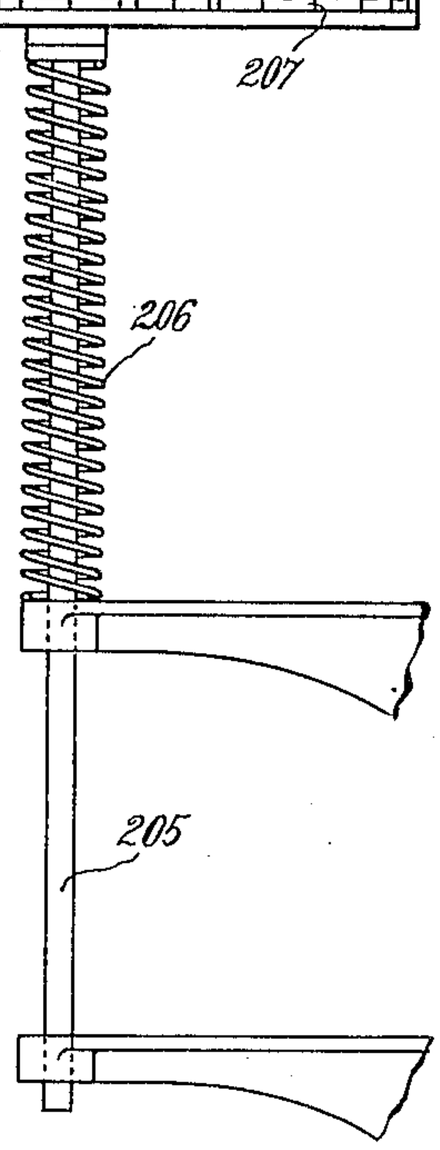




FIG. 20.

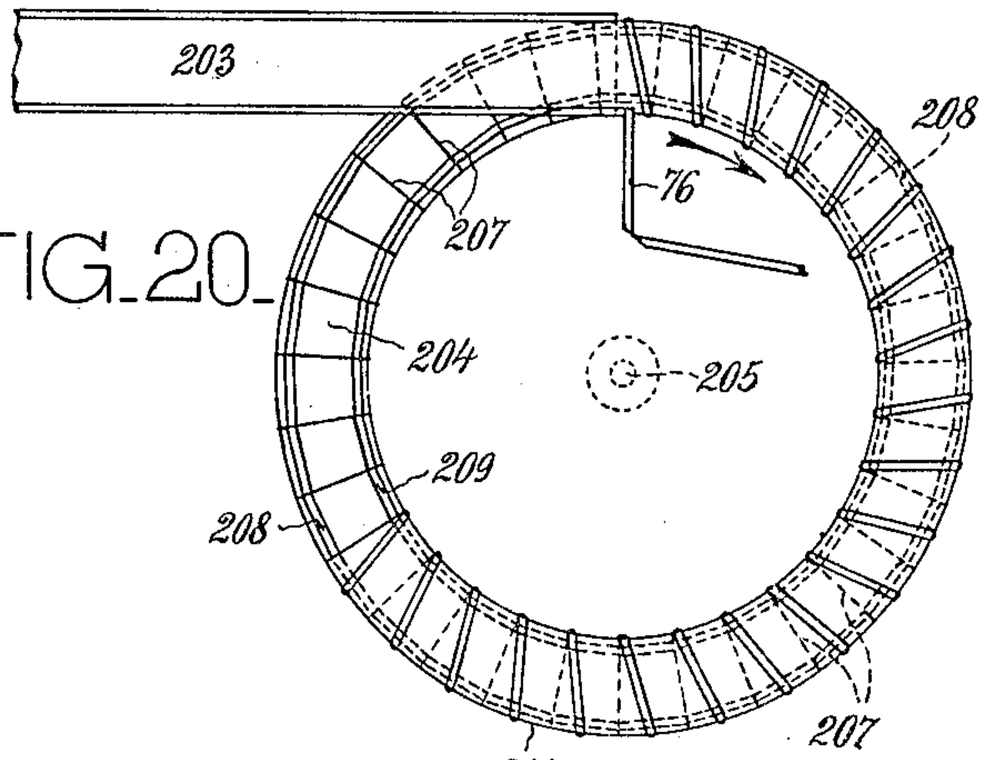
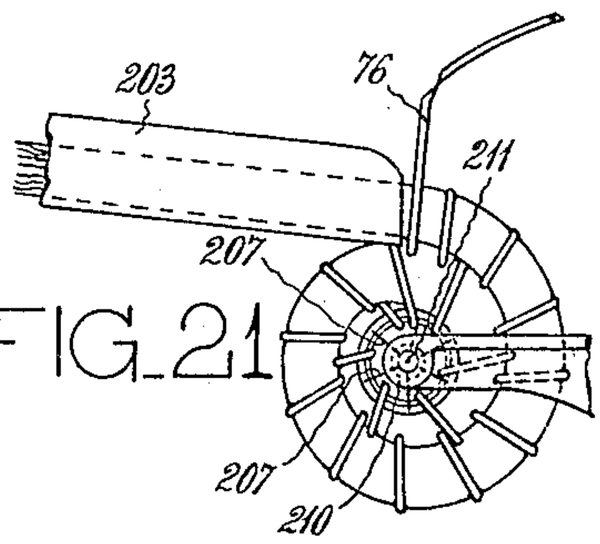



FIG. 21.

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No. 887,477. PATENTED MAY 12, 1908.

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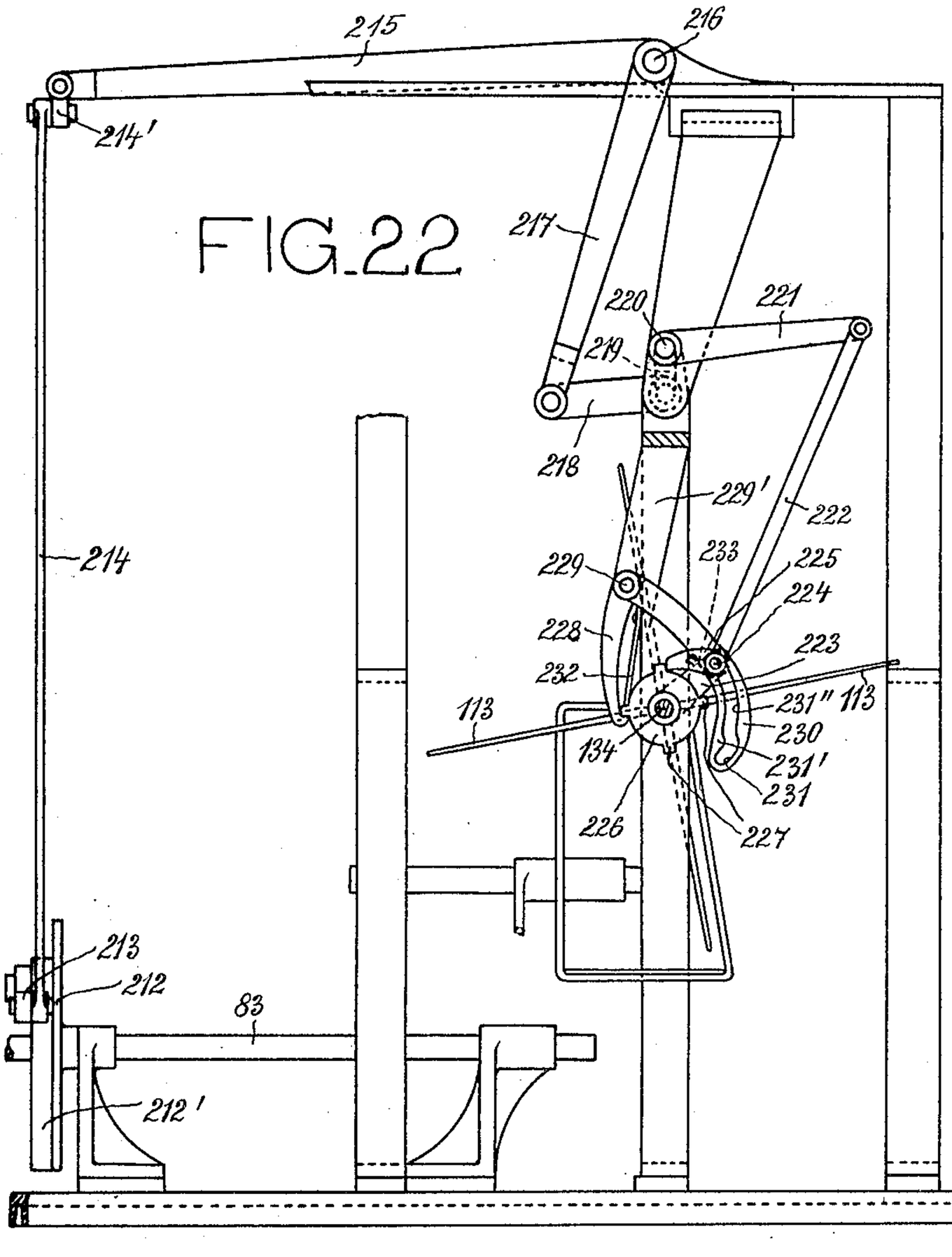
12 SHEETS—SHEET 10.

FIG. 22

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No. 887,477. PATENTED MAY 12, 1908.

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SEWING MACHINE FOR OVEREDGE STITCHING.

APPLICATION FILED JUNE 4, 1907.

12 SHEETS—SHEET 11.

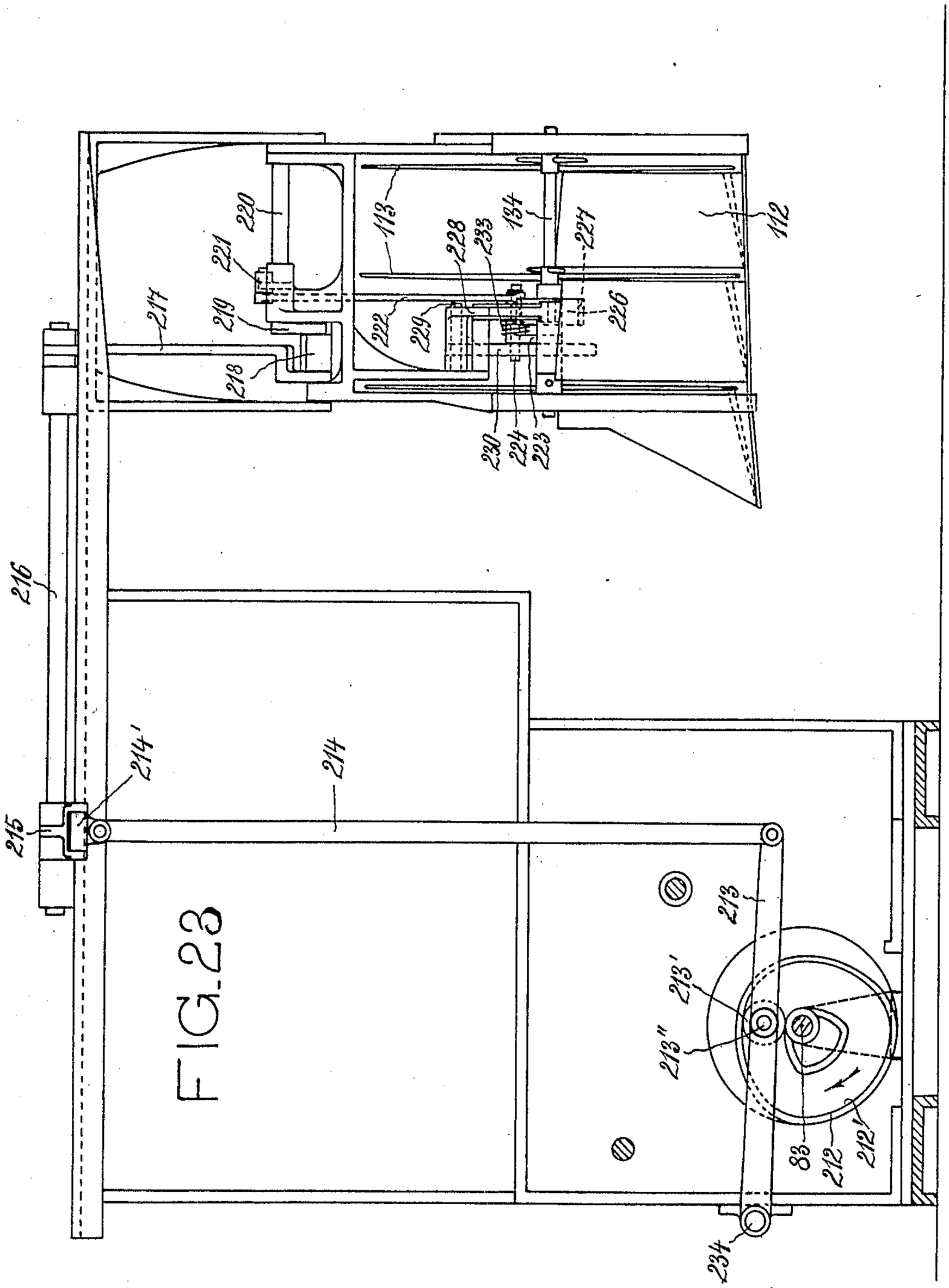


FIG.23

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# SEWING MACHINE FOR OVEREDGE STITCHING.

APPLICATION FILED JUNE 4, 1907.

12 SHEETS—SHEET 12.

FIG. 24.

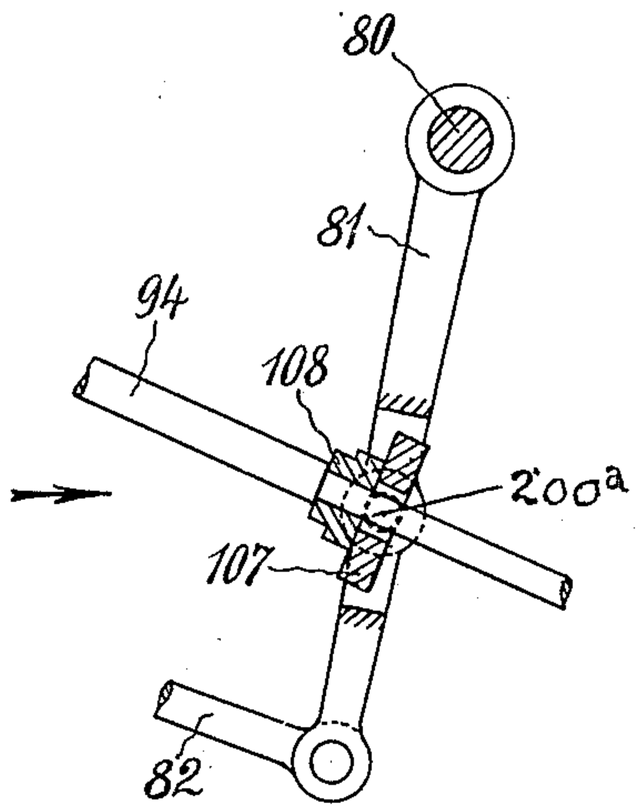
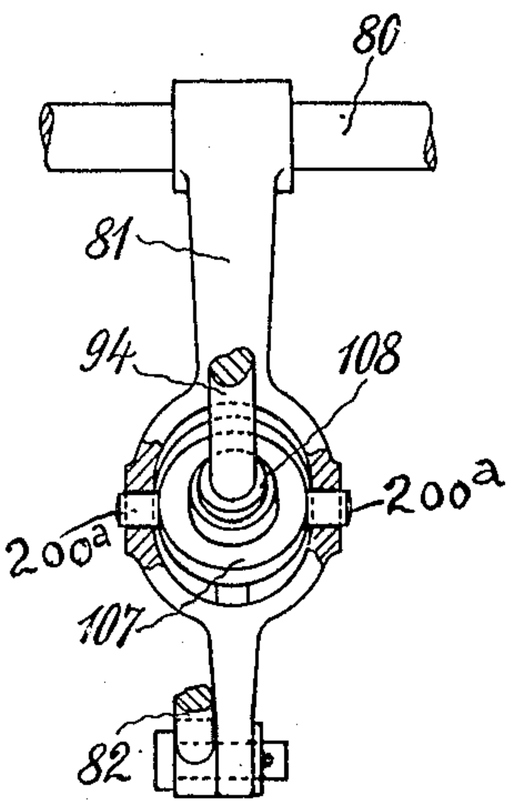



FIG. 25.

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# UNITED STATES PATENT OFFICE.

KARL HELLVOIGT, OF TRIER, GERMANY.

## SEWING-MACHINE FOR OVEREDGE-STITCHING.

No. 887,477. Specification of Letters Patent. Patented May 12, 1908.

Application filed June 4, 1907. Serial No. 377,187.

*To all whom it may concern:*

Be it known that I, KARL HELLVOIGT, a subject of the Emperor of Germany, residing at Trier, in the Kingdom of Prussia and Empire of Germany, have invented new and useful Improvements in Sewing-Machines for Overedge-Stitching, of which the following is a specification.

The invention relates to sewing machines for over-edging, over-seaming and the like with a circulating needle and particularly to such machines, with which stiff sewing-threads may be used, such as threads of Spanish cane of any thickness and width, iron and metal wire or band, waxed or pitched thread, sewing cord, horse-hair cords, gut-strings and the like. The machine is therefore best adapted for the manufacture of objects, which are made by sewing straw, straw and cocoa-fiber, ropes together such as mats, bee-hives and baskets for transporting bees, and also for edging leather, canvas and felt.

The stitch is similar to the over-edging stitch made by hand a single thread without the formation of loops being passed through the material from one stitch-hole to another over the edge of the material in the shape of a helix running through the material and covering the edge of it and continuing in the longitudinal direction of this edge.

The stitch is made by a semi-circular or arcuate needle revolving about the center of the arc, said needle pulling the thread along and between clamping and friction rolls, which are driven according to the required tension of the thread and which gripping the thread, cause the latter to be pulled after every stitch, while the needle after completion of every circulation is automatically stopped.

On the accompanying drawings, one method is shown for carrying out the invention, Figures 1–3 being diagrammatical side views of the sewing device in different working positions, Figs. 4 and 5 the side views of further position of the pulling device for the thread, Fig. 6 the side view of a detail of the pulling device for the thread, Fig. 7 a side view and Fig. 8 a front view of the needle guide and driving mechanism, Fig. 9 a side view and Fig. 10 a plan of the needle-end with the arrangement for fastening the thread, Fig. 11 a side view partly in section of a detail of the thread pulling or tensioning mechanism and Fig. 12 a plan of Fig. 11. Figs. 13–17 illustrate one form of device for starting and stopping the needle at every stitch. Figs. 18 to 21 illustrate the application of the invention to machines for making baskets. Fig. 22 is a front view, especially of the connections for driving the winch (113) from the shaft; Fig. 23 is a side view of the said parts; Fig. 24 is a side view (partly in section) of a detail, showing the relation of arm, 81, disk, 108, and rod, 94, hereinafter mentioned, and Fig. 25 is a front view (seen in the direction of the arrow of Fig. 24) of the same parts, with the disk, 107, broken away and showing the trunnions, 200[a].

The circular needle, 2, (Figs. 1–3, 7 and 8) preferably flat, runs on a circular guide path the latter having the necessary interruptions for introducing the object to be sewed. In order to reduce the friction, the guide path is suitably formed of guide rollers, 3, having side-flanges on the circumference for guiding the needle and revolubly mounted on fixed axles arranged in a circle. The needle, 2, is driven by means of friction rollers or by means of an endless belt, 4, which passes over a driving roller, 5, a guide-roller, 6, and a tension roller 7, in such a manner that one side of the belt is pressed against the rear side of the needle, 2, and moves it by friction.

The driving roller, 5, of the driving belt, 4, is loosely mounted on a fixed pivot, 8, and is periodically driven for each circulation of the needle through spur wheels, 134 and 135, from an intermediate shaft, 137, (Figs. 1–3, 16, 17) which is constantly rotating and which by means of the spur wheels, 138, 139 also causes the shaft, 83, to make one revolution at the time. The device for engaging and disengaging the needle-drive and the drive for the shaft, 83, is arranged on the intermediate shaft, 137, and is moved by suitable elements partly influenced by the needle as hereinafter described.

The tension roller, 7, of the needle driving belt is carried by a swinging frame, 9, which swings about a fixed bolt, 10, and which in accordance with the tension of the belt is under the influence of a spring, 11 (Figs. 1–3).

To the back and set-off end of the needle (Figs. 9 and 10) a member, 12, is linked adapted to move crosswise and provided with an eye, 13, the member, 12, being covered up to said eye by means of a spring, 14, which is fastened to the needle and projects with a free end. To the eye, 13, is fastened a firm and flexible pulling medium for instance

a hog's skin belt, 15, to the other end of which the locket of the thread is attached. The latter consists of a flat vise, 116, between the rigid cheeks of which a tongue, 117, can be turned crosswise about a rivet, 118. The tongue, 117, has a slot, 119 through which one end of the thread is drawn when the tongue is moved out. Upon the tongue being returned to its position between the cheeks of the vise, the thread owing to the clamping effect of the latter is securely fastened. The spring, 14, is provided with a perforation, 16. As soon as the needle after completion of the stitch is again at rest, a projection, 17, attached to a slide, 18, which moves tangentially in relation to the path of the needle, will enter this perforation, the guide, 19, of said slide swinging about a fixed pin, 20. The swinging motion of the lower end of the sliding guide towards the needle path is thereby limited in an adjustable manner by means of a screw, 21, so that the projection, 17, of the slide, 18, can be accurately adjusted in relation to the spring, 14, for the needle to move the slide along and push it upwards at the end of the working movement of the needle. This movement of the slide, 18, is further used for disengaging the needle-drive a description of which is given later on.

In order that the sewing thread may not enter the needle guide during the movement of the needle but that it may remain on the side of it a wedge-shaped guiding face, 114 (Figs. 7 and 8) is arranged on the lower end of the slide, 18, which diverts the belt attached to the needle and carrying the thread-locket and therefore also the thread, from the moving path of the needle, in other words away from the picture plane of Figs. 1, 2, 3 and 7 and towards the back. The path of the needle extends between two clamping and friction rollers, 22 and 23, which are pressed against each other under the action of a spring and which are driven according to the required pull of the thread after each stitch.

The rollers, 22, 23 are driven by means of an endless chain, 24, (Figs. 1, 2 and 3) which passes over the sprocket wheels, 25, 26, connected to the friction rollers, a guide and tension roller, 27, and a driving sprocket-wheel, 28. (Figs. 4 and 5). The latter is rigidly connected to a second sprocket wheel, 110, (Fig. 12) driven by a constantly rotating shaft, 105, and is revolubly mounted on a shaft, 29, arranged at right angles to the plane of the path of the needle and passes through its geometrical center. One friction roller, 22, is rigidly supported on the free end of the arm, 30, of a two armed roller supporting lever, 30, 31, (Figs. 1, 2, 3 and 11), the other roller, 23, however being supported from the end of the sleeve, 34, which is adjustable in guides, 32, 33, on the lever, 30, 31, (Fig. 11) the sleeve being prevented from turning by means of a fork, 35, attached to it and passing around the lever arm, 31. The sleeve is provided with a bush or end, 36, at the front through which a rod, 37, passes and against which a spring, 38, coiled round the rod, 37, abuts. The spring also acts on a piston shaped enlargement, 39, on the rod, 37, which is held behind this enlargement outside the sleeve, 34, in a further guide, 40, of the lever-arm, 31, while on its free end it is provided with a roller, 41. The guide, 32, for the sleeve, 34, has a pawl, 42, movable about a pin, 43, the pawl when in the locking position passing behind a tappet, for instance a roller 44, on the sleeve, 34, in order to keep the friction roller, 23, a certain distance from the roller, 22. The pawl, 42, has an arm, 45, with an arc-shaped slot, 46, for the bolt, 47, on one end of a guide, 48, the other end of which is jointed to the top end of the rod, 37. The latter is also prevented from turning by means of a fork, 49, fastened to it and also passing around the lever arm, 31. The rod serves to put the spring, 38, in the sleeve, 34, under tension, as soon as—in a manner still to be described—it has been moved accordingly. At the end of this movement, a tappet for instance in the shape of a roller, 50, and fastened to the fork, 49, of the rod, 37, passes behind a pawl, 51, movably fastened to the guide, 40, the pawl having an arm, 52, by means of which its disengagement is effected in a manner to be hereinafter described. When the rod 37, is moved contrary to the action of the spring, 38, the bolt, 47, (being carried by the guide 48) will slide in the slot, 46, of the arm, 45, of the pawl, 42, without moving the latter. If the pawl, 42, becomes disengaged in a manner still to be described, the released sleeve, 34, is forced forward by means of the compressed spring, 38, and the friction roller, 23, is pressed against the roller, 22. If however, the pawl, 51, becomes disengaged, and as the consequence thereof the rod, 37, moves back to the position of rest indicated in Fig. 11, during its movement the pawl, 42, is forced again into the locking position and the sleeve, 34, is moved back through a space equal to that between the friction rollers.

The lever, 30, 31, is fastened to the shaft, 29, and is under the influence of a spring, 55, (Fig. 6) which acts with a downward tendency on an arm, 56, also fastened to the shaft, 29, and pointing in the same direction as the lever arm, 31. The effect of the spring, 55, is preferably adjustable by means of a regulating screw, 57. Besides the lever, 30, 31, and the arm, 56, still another arm, 58, is fastened to the shaft, 29, with a loop, 59, on the free end. Into the latter fits a pin, 60, on the free end of the upper lever, 61, of a pair of toggle levers 61, 62, the lower lever of which, 62, is pivoted on a fixed pin, 63, the oscillations to the right and left being restricted by means of tappets, 64, 65. By

means of a spring, 66, the toggle joint, 67, is pushed towards the tappet, 64, so that the lower lever, 62, will rest against the tappet, 64, while the pin, 60, is held sidewise by the loop, 59, of the lever, 58. This is the position of support of toggle levers, 61, 62, from which, in order to release the lever, 30, 31, and to leave it to the effect of the spring, 55, it is displaced by means of the disengaging slide, 18, moved upwards by the needle. For this purpose the arm, 68, of a two-armed lever, 68, 70, turning about a fixed pin, 69—is movably connected to the disengaging slide, 18, (Fig. 6) the arm, 70, of said lever being movably connected to the arm, 71, of a two armed lever, 71, 72, also turning about a fixed pin, 73. The arm, 72 of the lever, 71, 72, rests with its free end against the joint, 67, of the levers, 61, 62, so that the lever 62 is pushed against the tappet, 65, whenever the disengaging slide, 18, is moved upwards.

Released by the supporting lever, the lever, 30, 31, is turned with the arm, 31, downwards by means of the spring, 55, through the medium of the arm, 56, until the arm, 31, strikes against a fixed rest, 74, (Figs. 1–5). Simultaneously therewith a projection, 53, on the arm, 45, of the pawl, 42, strikes against a fixed tappet, 75, (Fig. 3), so that the pawl, 42, is disengaged and the sleeve, 34, carrying the friction roller, 23, is released. The friction rollers grip the thread, 76, passing between them, pull the thread tight and thereupon *i. e.* after the thread has been pulled tight (Figs. 4 and 5) run along the thread towards the material being sewed and overcoming the force of the spring, 55, raise again the arm, 31, of the lever, 30, 31. Thereby the supporting toggle levers, 61, 62, being relieved are forced again into position of support by the spring, 66. When the lever arm, 31, reaches the maximum position (Fig. 5) the arm, 52, of the pawl, 51, strikes against a fixed tappet, 77, so that this pawl is disengaged and thus the rod, 37, released, whereupon it can return to its position of rest, and the thread released by both clamping rollers.

In the maximum position of the arm, 31, the spring 38, is put in compression in the sleeve, 34, by the moving rod, 37. For the latter purpose the roller, 41, is held or kept at the free end of the rod, 37, by means of a notch, 78, in the arm, 79, of a double armed spring compressing lever, 79, 81. The lever arm, 31, is thereby supported in its highest position. The lever, 79, 81, swings about a fixed pin, 80, its lower arm, 81, being by means of a rod, 82, connected to a crank pin, 84, on the driving shaft, 83, rotating periodically in the direction of the indicated arrow (Fig. 1). When the crank, 84, is passing through the lower semi-circle of its path (Fig. 2) the lever, 79, 81, will receive its working movement and will push the rod, 37, with its swelled portion, 39, contrary to the action of the spring, 38, into the sleeve, 34. Thereby the arm, 31, of the lever, 30, 31, still held by the notch, 78, is gradually lowered, whereby the pawl, 51, is turned slowly into the locking position, until, after the lever, 79, has passed through a certain distance and after the spring, 38, has attained a certain amount of compression, the pawl is out of contact with the tappet, 77, and has passed again behind the roller, 50, on the rod, 37, thereby holding the spring 38, in compression. Upon a further turning of the crank, 84, and towards the end of the movement, the arm, 79, having moved beyond the roller 41 releases the end of the rod, 37, and thus also the arm, 31, of the lever, 30, 31. The latter then, owing to the action of the spring, 55, strikes against the supporting toggle levers, 61, 62, which are in the position of support.

To the arm, 79, of the lever, 79, 81, the guide, 19, of the disengaging slide is connected by means of a rod, 140, (Figs. 1–5) in such a manner, that the guide, 19, is swung outwards by the movement of the lever arm, 79, (Fig. 2) whereby the projection, 17, on the disengaging slide, 18, is forced out of the perforation of the spring, 14, and the disengaging slide is released again. Further, a rod, 86, is movably connected to the upper end of the arm, 79, the rod, 86, being guided at its free end and having an adjustable tappet, 87. The latter in the final part of the working movement of the lever, 79, 81, acts in such a manner on a third arm, 88, of the lever, 68, 70, connected to the disengaging slide, 18, that the slide, 18, in the meantime released by the spring of the needle, is moved downwards into its position of rest so as to be in readiness to be taken along again by the cover spring of the needle, upon the needle completing the next circulation.

The lever, 30, 31, with the present method for carrying out the invention, not only pulls or tightens the thread, but when passing from one position to another also controls the drive of the needle and that of the shaft, 83, from the intermediate shaft, 137. The apparatus for doing this is shown in Figs. 13 to 15 in the different working positions. The spur wheel, 135, for the needle drive and 138, for driving the shaft, 83, are not directly mounted on the shaft, 137, which is rigidly supported, but on sleeves, 141 and 142, respectively which turn on the intermediate shaft, 137, and each of which carries one half of a friction clutch, 143,·144, each half being adapted to be pressed against a corresponding clutch member, 145, and 146, respectively mounted on the intermediate shaft, 137. The friction clutch may be of any suitable design, therefore no further description need be given. The part of the clutch, 145, for the needle drive mounted on the intermediate shaft, 137, is connected to the driving pulley, 147, of the intermediate shaft,

137. The engaging and disengaging of the clutches is effected by means of a sleeve, 148, which is moved by a double-armed lever, 149, 150. The arms of the latter are not rigidly joined, but are preferably jointed together and maintained in the straight position by means of a sufficiently powerful spring, 151. The latter for this purpose acts with its free ends on two pins arranged opposite to each other on the arms, 149, 150, and on prolongations of them beyond the joint so that the one spring is sufficient in order to permit a yielding both ways. The upper arm, 150, is movably connected by means of a rod, 152 connected to a cross piece, 153, which is guided in the fork-shaped ends, 154, of the longitudinal sides of a frame, 155, and which is movable, such movement being limited towards the interior by the tappet, 159. The frame, 155, itself is horizontally movable in guides, 158, of the machine frame and is connected with it by means of a spring 160, the other end of which is fastened to a small bracket, 161, on the frame. Another spring, 157, is attached at one end to the movable cross piece, 153, and at the other end to a cross piece, 156, of the frame, 155. Both springs, 160 and 157, reverse the movement of the disengaging lever, 149, 150, at the proper time. The spring, 157 and 160, are put in tension by toggle levers, 167, 168, one member of which is joined at 169 to the machine frame and the other member at 170 to the frame, 155. These toggle levers are straightened by means of suitable rods not shown from the shaft, 83, and on every revolution of the latter. When in a straightened position the toggle levers rest with their joint against a fixed tappet on the frame, 155. For this purpose cross ways to the frame and on the lever, 167, a tappet, 171, is arranged and fits under the longitudinal side of the frame.

For regulating the action of the springs, the following arrangement is used:—The upper end of the arm, 150, of the disengaging lever is joined to the free end of the one member, 162, of a pair of toggle levers, 162, 163, the other member of which, 163, is movably fastened at 164 to the machine frame. A spring, 165, tends to force these levers into the straightened position, which is maintained by a fixed tappet, 166, against which the joint rests. (Fig. 13). If these supporting levers are in a straightened position, the clutch, 144, 146, and thus the shaft, 83, will be engaged. The connecting pin, 172, between the arm, 150, of the disengaging lever and the member, 162, of the supporting levers, 162, 163, is extended on one side and this extension fits into a slot, 173, in the one member, 174, of a second pair of supporting toggle levers, 174, 175, the lower member, 175, of which is movably attached to the machine support namely at 176. The straight position of these supporting levers is also secured by a fixed tappet, 177, on the machine frame, with which a projection, 178, on the member, 175, engages. A disengagement of the springs, 157, and 160, is effected by bending the levers, 162, 163 and 174, 175, accordingly and this again is done by moving the lever 30, 31. For this purpose on the shaft, 29, of this lever a lever arm, 56, (Fig. 6) is fastened, which is attached to the lower end of a rod, 179, vertically guided. The latter has three pins, one, 180, for the levers, 162, 163, a second, 181, for the levers, 174, 175, and a third 182, for the spring tightening levers, 167, 168.

In Fig. 13, the rod, 179, is shown in its maximum position. This corresponds with the maximum position of the arm, 31, of the lever, 30, 31, and with the engagement of the shaft, 83. The latter, as mentioned in the aforegoing, at the commencement of one complete revolution puts the two springs, 157 and 160 in tension by straightening the tension levers, 167, 168. This working stage is shown in Fig. 13. The exact rotation of the shaft, 83, one revolution at a time is insured by a special device, which will be described later on. At the end of the revolution of the shaft, 83, the rod, 37, slides from the support, 78, on the spring tightening lever, 79, 81, which is operated by the shaft, 83. The lever arm, 31, owing to the action of the spring, 55, strikes downwards, until it is caught by the supporting lever, 61, 62, before described. With this movement of the lever, 30, 31, which is followed by the rod, 179, the pin, 180 of the latter will strike against the joint of the supporting levers, 162, 163, and will bend the latter downwards (Fig. 14). Hereby the spring, 157, is released and pulls the crosspiece, 153, until it reaches the tappet, 159. Owing to its connection with the cross piece, 153, by means of the rod, 152, the top of the disengaging lever, 149, 150, is thereby moved to the right. By this means the clutch, 144, 146, for the shaft, 83, is disengaged and 143, 145, for the needle drive is engaged. The supporting toggle levers, 174, 175, during this operation by means of their spring move into the straight position, and the bolt, 172, slides forward in the slot, 173 of the member, 174.

The needle makes its revolution and at the end of it in the manner described compels the disengaging slide, 18, to follow, which causes a bending of the levers 61, 62, and thus causes the lever arm, 31, to fall onto the rest 74. With this movement of the lever, 30, 31, the pin 182, on the rod, 179, bends the tension-levers, 167, 168, downwards. The spring, 160, is thereupon relieved and pulls the frame, 155, and the disengaging lever, 149, 150, which is connected to the frame by means of the pushing rod, 152, joined to the crosspiece, 153, is pulled to the left until the

pin, 172, reaches the end of the slot, 173, of the member, 174, of the toggle-lever, 174, 175. The disengaging lever, is then in its middle position (Fig. 15). In this position both clutches on the shaft, 137, are disengaged; the needle and the shaft, 83, are both at rest and the clamping roller, on the lever, 30, 31, causes the thread to be pulled. The clamping rollers compel the lever, 30, 31, to follow, and as they finally run along the tightened thread, the lever arm, 31, is lifted again and with this movement the pin, 181, on the rod, 179, bends the toggle levers, 174, 175, upwards, whereby the springs, 160, is fully released and pushes the frame, 155, with the disengaging lever, quite to the left, in which position the clutch for the shaft, 83, is again engaged.

In order to insure that the shaft, 83, makes one exact revolution at a time (Figs. 16, 17) one end of it is provided with a locking disk, 183, having a ratchet tooth, 184, behind which a pawl, 185, engages every revolution, the pawl being movably fastened to the machine frame and forced into the working position by means of a spring in order to prevent the shaft, 83, from turning back. On the free and front side of the locking disk, 183, is a pin, 186, on which pivots a bell-crank lever, 187, 188. The swinging of the arm, 188, of this bell crank lever, is limited by two tappets, 189, 190, fastened to the locking disk. The arm, 187, however, is bent on its free end, the extreme end forming an arc, which is concentric to the axis of the shaft, when the lever-arm, 188, is resting against the tappet, 189, (Fig. 16). This concentric arc on the arm, 187, in the position of rest of the shaft, 83, rests against a movable tappet in the shape of a roller, 191, carried by the lever, 192. The latter swings about a fixed pin, 193, and in its lowest position rests on a fixed support, 194. If the lever arm, 187, is released by the roller, 191, on the lever, 192, being raised to such an extent, that the lever arm, 187, can slide by the roller, 191. This may for instance be effected by a rod, 195, which connects the lever, 192, with the arm, 31, of the lever, 30, 31, in such a manner, that the rod, 195, only upon the arm, 31, reaching its maximum position, is raised by such an amount, that the roller, 191, releases the arm, 187, of the bell crank lever, 187, 188. For this purpose, the rod, 195, has a correspondingly long eye, 196, for receiving a pin, 197, on the arm, 31, of the lever, 30, 31. The arm, 188, is connected by means of a rod, 198, to a lever, 199, the latter swinging about a pin, 201, and being influenced by a spring, 200.

Upon the lever arm, 31, swinging upwards and reaching its maximum position, the toggle levers, 174, 175, are as previously described, bent upwards, whereby the coupling for the shaft, 83, is engaged. At the same time the locking lever, 192, is also lifted so that its roller, 191, releases the arm, 187, and the shaft, 83, is free to revolve. The spring, 200, assisting this movement through the released bell crank-lever, which moves over until its arm, 188, strikes the tappet, 190, whereupon the spring, 200, is able to exert a torque on the locking-disk, 183, and therefore also on the shaft, 83. This continues until the arm, 188, and the rod, 198, are in a straight position. Upon a further turning of the shaft, 83, the tappet, 189 again compels the arm, 188, to follow the movement of the shaft, whereby the spring, 200, is put in tension and the movement of the shaft, 83, is retarded. In the maximum position, the lever, 199, is arrested by a fixed tappet, 202, which limits the turning of the locking disk, 183, and of the shaft, 83, (Fig. 16). The locking-lever, 192, owing to a slight lowering of the lever-arm, 31, which in the meantime has taken place, is lowered again into the locking position and takes up the free end of the arm, 187, so that the bell crank lever, 187 188, can not at present follow the action of the spring, 200. The pawl, 185, has in the meantime engaged the ratchet tooth, 184, of the locking disk, 183, and prevents the latter and the shaft, 83 from turning backwards.

In order to secure a complete standstill of the needle after the completion of each circular motion, and in order to destroy the tendency of the needle to remain at rest after the disengagement has taken place, a brake is provided for the needle-driving belt of the driving pulley, 5, (Figs. 1, 2, and 3). The latter is rigidly connected to a brake disk, 89, which is controlled for instance by a toggle-lever-brake-mechanism. The cheeks, 90, 91, of the latter are movably connected by means of a fixed pin, 103, and between the latter toggle-levers, 92, 93, is arranged, the link bolt, 104, being attached to a rod, 94, which passes through and is guided in the bolt, 103, and is hinged at its other end to the arm, 95, of a double armed lever, 95, 96. The latter moves about a fixed bolt, 105. A spring, 98, is connected to the arm, 96, by means of links, 97, the tension of the spring being adjusted by means of a regulating screw, 99. This spring is put in tension during the working movement of the lever, 79, and the arm, 81. The disk, 107 (Figs. 1—3 and 24 and 25) is rotatively supported by trunnions, 200[a], on the arm, 81. Said disk slides lengthwise on the rod, 94, and acts upon a tappet, 108, rigidly mounted on said arm. The locking of the action of the spring and the disengaging of the same at the proper time is effected by the arm, 31, of the lever, 30, 31. The arm, 31, is provided for this purpose with a support 54, on its free end, (Figs. 1—3), with which a lever, 102, engages upon a compression of the spring, 98, in the maximum position of the arm, 31, the lever, 102, being movably connected to a lever, 101,

oscillating about a bolt, 109, and limited in its movements on both sides. The lever, 101, is connected to the arm, 96, of the brake spring lever, 96, 95, by means of a rod, 100.

When the lever arm, 31, in its lowest position rests on the support, 74, which happens after the completion of each circulation of the needle, the supporting lever, 102, slides from the support, 54, (Fig. 3), the brake-spring is released and the brake applied, whereby the movement of the needle is instantaneously arrested. The brake-spring, 98, also supports the spring, 55, when the latter is acting on the lever, 30, 31, in order to cause the latter to move as quickly as possible from one position to the other and to insure a quick reversal of the clutches by means of this rapid change of position. After the pulling or tightening of the sewing thread, 76, is completed, the latter must be removed again from between the rollers 22 and 23, which are forced apart to enable the thread to be thrown over to one side. For this purpose a throw-off arrangement for the sewing thread is provided as shown specially in Figs. 6, 7 and 8. It consists of a rod 121, crossing the needle-path at right angles to its plane and movable longitudinally, said rod having a head, 122, arranged cross-ways to the needle path and the thread, 76. The rod, 121, is guided and secured against turning. It is provided with a pair of tappets, 123, 124, into which meshes a screwed segment, 125. This is movable on a shaft, 126, and has an arm, 127, which by means of a rod 128, is connected to a lever-arm, 129, fitted with cams, 131, 132, the arm being mounted on a shaft, 130. A crank 133, on the shaft, 83, acts on the cams, 131, 132, the arm 129 being moved in one direction when the crank acts on the cam 131, and in an opposite direction shortly afterwards when the crank acts on the cam 132, these actions are transmitted to the segment, 125, and this effects a corresponding to-and-fro-movement of the throw-out rod 121, whereby the thread, 76, between the separated rollers 22, 23, is thrown off.

On the shaft 83 is a cam 212 (see especially Fig. 23) in the curved groove of which 212′ engages a pin 213′ provided (Fig. 23) with a roll 213″ on a lever 213, which can swing around a bolt 234 fixed on the machine frame and is connected by a rod 214 and by a link 214′ with the free end of a lever 215 which operates a shaft 216 journaled at the top of the machine frame. The shaft 216 at the end opposite lever 215 operates a second one-armed lever 217, the free end of which embraces a link 218, and the latter engages a crank 219 which is fastened on a shaft 220 parallel with shaft 216. On shaft 220 is fastened an arm 221, the free end of which is connected by means of a rod 222 with a crank 233 pivoted on the winch shaft 134. The pin 224 of this crank is extended and carries a pawl 225, which engages in the teeth of the four-toothed ratchet wheel 226 fixed to the winch shaft 134. The aforesaid crank pin 224 also passes through a curved slot 231 in a curved arm 230, which is rigidly connected with a pawl 228. Such arm 230, is a part of a sleeve pivoted on a pin 229, and provided with the counter pawl 228. Pin 229 is fastened to an arm 229′ of the winch journal frame. The curved slot 231 has (see Fig. 22) a knee 231′. When the crank pin passes in its downward movement over the knee 231′ the arm 230 with the counter pawl 228 receives such a movement that (when the enlargement 231′ is reached) said counter pawl is released. The other part 231″ of the slot 231 is, when the form of arm 230 shown in Fig. 23 is employed, concentric to the shaft 134 of the winch 113 so that the counter pawl 228 remains during the movement of the crank pin 221 in the locking position in this upper part 231″ of the curved slot. A locking pin 232 always enters behind the tooth held by the counter pawl 228 during the downward movement of the pawl 225.

It is readily apparent that, with each revolution of shaft 83 and therewith with cam 212, the ratchet wheel 226 is shifted on the winch 224 by one tooth, and thereby the winch shaft receives each time $\frac{1}{4}$ revolution.

The complete operation of the apparatus is as follows:—Figure 1 is the starting position. The needle, 2 is at rest, the brake, 90, 91, is applied. The lever, 30, 31, with its arm, 31, has reached the maximum position, in which position the shaft 83, is coupled up, the relieved toggle levers 61—62, having been straightened by the spring, 66, and the pawl, 42, passed behind the roller 44, on the sleeve, 34, while the lever, 79, 81, commences its working movement and has received the roller, 41, at the end of the rod 37, in its notch, 78, on the arm, 79. Upon a further working movement of the lever, 79, 81, owing to the revolution of the shaft, 83, the rod, 37, is pushed forwards until the pawl, 51, is passed behind the roller, 50, on the rod 37, and the spring 38, in the sleeve, 34, has been put in compression. (Fig. 2). At the same time by means of the rod, 140, the guide, 19, of the disengaging-slide, is together with the latter forced outward, whereby the projection, 17, of the disengaging-slide, 18, is removed from the perforation, 16, in the spring, 14, of the needle, and the latter is released to enable it to make one complete circulation. In the latter part of the working-movement of the lever, 79, 81, the disengaging slide 18, by means of the tappet, 87, on the rod, 86, and of the lever, 88, 68, 70, is then pushed downwards again in order to be swung inwardly again on the return of the lever, 79, 81, by means of the rod, 140, thus being ready for the projection, 17, to enter the per-

foration, 16, of the spring, 14, upon the needle completing its next circulation. Further, the needle-brake is opened by means of the disk 107, and by means of the tappet, 108, mounted on the rod, 94. The supporting lever 102, passes into the support 54, of the lever, 30, 31, thus keeping the brake opened. During the rotation of the shaft, 83, the winch 113, as herein described is also moved (in order to push the thread in the thread basket, 112, on one side, so that the basket becomes ready for the next stitch,) and the thread between the friction rollers, 22, 23, is pushed out in the manner described. The lever, 79, 81, owing to the complete revolution of the main shaft now returns to its position of rest. During the last moment of its movement, the rod 37, with its off-set slides off the off-set of the notch, 78, of the lever arm, 79, and the lever, 30, 31, (with its arm, 31, pulled by the spring 55), drops on to the toggle levers, 61, 62, which are now in the supporting position. In this position of the lever, 30, 31, the drive of the shaft, 83, is disengaged and the needle drive is in gear. The needle now commences to circulate and during its final movement it compels the disengaging-slide, 18, to follow by means of its spring, 14, the perforation 16, of which engages the projections, 17, attached to the slide 18 (Figs. 9—10). The latter, owing to its upward movement and by means of the double-arm lever, 68, 70, and 71, 72, bends the link, 67, of the toggle levers, 61, 62, towards the tappet, 65, so that the lever, 30, 31, will lose this support, and, driven by the spring, 55, and the needle-brake-spring, 98, drop on to the fixed support, 74. (See Fig. 3.) At the same instant the needle drive also stops, and both clutches on the shaft, 137, are disengaged. The supporting lever, 102, slides off the support, 54, of the lever, 30, 31. As a consequence thereof, the needle-brake is put in action, and the needle is instantly brought to a standstill. At the same time however, shortly before the lever, 30, 31, strikes against the support, 74, the pawl, 42, owing to its projection 53, striking against the fixed tappet, 75, has become disengaged, whereby the sleeve, 34, is disengaged in order to force the roller, 23, against the counter-roller, 22. The roller, 22, 23, constantly rotating in order to impart a pull to the thread, then tighten the thread (Fig. 3), which, owing to the circulation of the needle, is passed through the sewing material, and pushes the rest of the thread along a guiding face, 111, which deflects it from the roller-fork of the sleeve, 34, the lower end of the disengaging slide, 18, also deflecting it in an outward direction and into a thread basket, 112. In this basket it is pushed to one side by means of rotating blades, 113, which, with each working movement of the shaft, 83, make one quarter of a turn, the movement being effected by means of a suitable ratchet-mechanism on the shaft, 134.

As soon as the thread has been pulled tight, the clamping and friction rollers compel the lever, 30, 31, to follow their movement along the sewing thread (Fig. 4), contrary to the action of the spring, 55, whereby the lever, 30, 31, with its arm, 31, passes into the highest position. The pawl, 52, by means of the tappet, 77, is then again disengaged, (Fig. 5); the rod, 37, moves back and with its roller, 41, passes into the notch 78, which, owing to the position of rest of the lever, 79, 81, is in readiness to receive the forthcoming roller, 41, of the slightly lowered lever-arm, 31.

Upon a backward movement of the rod, 37, towards the lever, 79, 81, the sleeve, 34, with the clamping and friction roller, 23, also moves backwards, since the pawl, 42, by means of the guide 48, is forced behind the roller, 44, on the sleeve, 34, whereby the clamp and friction roller 37 (supported from the end of sleeve 24) no longer pulls the thread. In this position of the lever, 30, 31, the drive for the shaft, 83, is coupled up again and the locking-lever, 192, for the locking-disk, 183, is raised, so that the shaft, 83, can again make one rotation in the manner described, in order among other things, and in the first place to throw off the thread from the lower clamping and friction roller by means of the arm 133, in the manner described with reference to Figs. 6, 7, and 8.

During the lifting of the arm, 31, the supporting toggle levers, 61, 62, are also raised again by the spring, 66, and the lever, 79, 81, moved by the shaft, 83, now puts the springs, 38, and 98, respectively in compression and tension again, whereby the supporting lever 102, for the latter will be above the support 54, on the lever-arm, 31, (Fig. 2,) for the lever, in order to rest there on the return of the lever, 79, 81. The disengaging slide, 18, is moved downward and the slide guide 19, returns to the original position, whereby the needle at the end of its new circulation will take hold again of the slide in the manner described. The material to be sewed is advanced before each new circulation of the needle in a direction at right angles to the circulating plane of the needle, preferably by suitable means actuated by the shaft, 83. If the thread is nearly used up, a new one is tied to it.

The machine can be used for all purposes for which any other machine for over edging, over-seaming and the like may be employed. It is used for stitching edges and seams, also for the manufacture of baskets, mats, bee-hives, and the like of straw, reed, wood-shavings, cocoa-fiber or of similar material in the shape of a rope or string. In the latter cases, the sewing material newly inserted is braided by the thread, passed around said

material by means of the circulating needle, while the needle at the same time stitches also the adjacent part of the sewing material already sewed, also at the same time pulling the thread through, whereby, after the thread has been finally tightened by the clamping and friction rollers, 22, 23, the sewing material newly introduced is connected with that already sewed. (Figs. 1–5 and 7). This process is further explained by the following description of the manufacture of a cylindrical bee-hive.

In order to facilitate the shaping of goods, such as baskets and the like, separate templets are used by the machine, which have the sectional shape of the bodies to be made.

The use of a templet for making the cylindrical bee-hive is, for instance, shown in Figs. 18 to 21. Fig. 18 is a front view of a sewing device with a basket in the process of manufacture, Fig. 19 a side view of the sewing device with a partial cross-section of the unfinished basket, and Fig. 20 is a plan of Fig. 18.

The sewing material is supplied through a guiding trough 203, which terminates just in front of the circular path of the needle 2, the bottom of the trough being slightly higher than the lowest point of the needle path (Figs. 18 and 19). The templet consists of a horizontal and round plate 204, which can be lowered, and which is provided with a shaft 205 turning in fixed supports. The diameter of the templet corresponds with that of the basket to be manufactured. By means of a weight or spring 206 it is easily forced underneath the trough which rests on the rim (Figs. 19 and 20). The plate 204, at equal intervals, has steel-hoops 207, which on their upper edge on the inside and outside are provided with holes through which two cords 208, 209 are drawn and tightened in such a manner that they form an outer and an inner ring on the disk 204 (Fig. 20). These cords on the templet serve as a firm support for the first convolution or coil of the basket to be made. When the needle completes a revolution it passes the thread 76 between the hoops 207 underneath the coil resting thereon and once through the cords 208, 209 drawn through the hoops, and comes then to a standstill, as previously described. The clamping and friction rollers 22, 23 move forward the remaining part of the sewing-thread which is about from 4 to 6 meters long, so that the end of the sewing-thread will be placed firmly around the roll or rope and the cords, thereby firmly connect the coil to the templet. After the object is finished, the cords are taken out, whereby the object is freed from the templet.

The first coil on the templet may be made by hand instead of by machine. At the commencement of the working of the machine, the sewing material in the trough is slightly drawn out, and is fastened by means of a cord to one of the hoops 207 of the templet. The sewing thread 76 is then fastened with the one end to the fixed starting point on the templet, and with the other to the thread locket of the needle 2, whereupon the machine can be started. By pulling the sewing thread tightly, the coupling of the shaft 83 is engaged with its drive by the lever 30, 31, as described above, whereby the shaft makes one revolution. With this revolution the shaft 83 may also move forward any device for advancing the sewing material by the length of one stitch, whereby the templet is also rotated in each case. Then follows the next stitch. Owing to the wedge-shaped commencement of the coil, and to the slightly inclined position of the trough, the coil, as it again returns to the needle path and passes underneath the trough, forces the templet downwards. During the further working of the machine the needle always pierces the next lower coil (Fig. 18) and pulls the sewing thread through and over the coil thereon. In this manner the adjacent coils are always connected to one another.

When making round and flat objects, such as lids and bottoms, the process is the same as shown in Fig. 21 which is a front view. In this case a downward movement of the disk or drum 210 is used, which turns on a horizontal pin 211, vertically underneath the end of the trough. The hoops 207, are here on the circumference of the disk 210. The turning pin is movable in a downward direction and the object is made by sewing strings of a twisted or loose sewing material spirally by means of overseaming, and the like. The sewing apparatus may, however, also be used for seaming objects, such as covers and also for sewing ropes to the rims of sails and the like.

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

1. In a sewing machine for overedging, overseaming and the like, having an arcuate needle adapted to revolve about its geometrical center, clamping rollers arranged in the path of the needle so that the needle can pass between them and draw the thread between them and means for rotating said rollers, for the purpose of imparting the necessary pull to the thread to tighten the same after each stitch, and means for arresting the needle during said operation.

2. In a sewing machine of the character described having means for driving the needle, and means for periodically disengaging said driving means, for enabling the needle itself to effect its arrest after the completion of each circulation comprising a tappet on the needle and a member adapted to engage therewith said member being operatively connected with the aforesaid disengaging means.

3. In a sewing machine of the character

described comprising an arcuate needle, means for revolving the needle about its geometrical center, means for arresting the needle after each stitch and means for tightening the thread after each stitch, means for driving the needle comprising an endless belt having one side in frictional contact with the back of the needle, and means for driving said belt.

4. In a sewing machine of the character described comprising an arcuate needle adapted to revolve about its geometrical center, means for arresting the needle after each stitch and means for tightening the thread after each stitch, means for driving the needle and brake for arresting said driving means, and means for releasing said brake after the needle driving means have stopped, substantially as and for the purpose set forth.

5. In a sewing machine of the character described and comprising an arcuate needle, means for revolving the needle about its geometrical center, means for arresting the needle after each stitch, and means for tightening the thread after each stitch comprising clamping rollers arranged in the needle path, means for supporting said rollers and means for moving one of said rollers away from the other, for the purpose of allowing the needle to pass between them, and means for moving the said roller towards the other to clamp the thread when the needle is arrested.

6. In a sewing machine of the character described and comprising an arcuate needle, means for revolving the needle about its geometrical center and means for arresting the needle after each stitch; clamping rollers, 22, 23, arranged in the path of the needle for the purpose of pulling the thread tight after each stitch, a pivoted lever, 30, 31, the pivotal axis of which passes through the geometrical axis of the needle, said lever carrying one of the clamping rollers, 22, a spring, 55, for moving said lever, a pair of toggle levers 61, 62, for normally resisting this movement a sleeve on said lever carrying the other roller, 23, and adapted to slide relatively to the lever, a spring for resisting this sliding movement a pawl, 42, for retaining the sleeve in the one position against the action of the spring, and means for releasing the pawl, 42, to allow the spring to thrust the sleeve and therefore the roller, 23, towards the aforesaid roller, 22, when the needle is arrested consisting of a slide, 18, adapted to be engaged by the needle, a lever connected to said slide and adapted to bend the aforesaid toggle-levers when said slide is engaged, and a fixed tappet, 75 adapted to engage the aforesaid pawl, 42, substantially as and for the purpose hereinbefore set forth.

7. In a sewing machine of the character described and comprising an arcuate needle means for revolving the needle about its geometrical center, means for arresting the needle after each stitch, two clamping rollers arranged in the needle path for tightening the thread after each stitch means for rotating said rollers a pivoted lever, 30, 31, for supporting one of said rollers, a sleeve on said lever movable relatively thereto and supporting the other roller and a spring for moving the sleeve in one direction to draw its roller away from the roller carried by the lever; means for compressing the spring, a pawl, 51, for retaining the sleeve against the action of the spring, a fixed tappet, 77, adapted to engage the pawl and move the same for the purpose of releasing the sleeve and allowing the same to withdraw its roller, when the aforesaid pivoted lever is moved by the clamping rollers after the thread is tightened and said rollers consequently travel on the thread and means for supporting the pivoted lever after it is moved substantially as and for the purpose hereinbefore set forth.

8. In a sewing machine of the character described and comprising an arcuate needle, means for revolving the needle about its geometrical center, means for arresting the needle after each stitch, two clamping rollers arranged in the path of the needle for tightening the thread after each stitch means for rotating said rollers, a pivoted lever, 30, 31, for supporting one of said rollers, a sleeve on said lever movable relatively thereto and supporting the other roller, and a spring for moving the sleeve in one direction to draw its roller away from the roller carried by the lever; a rod, 37, for compressing the spring, a pawl, 51 for retaining the sleeve against the action of the spring, a rocking lever, 79, 81, for moving said rod, 37, means for oscillating said rocking lever once during the arrest of the needle, a notch in the said rocking lever for receiving the end of the rod, 37, and for thereby retaining the aforesaid pivoted lever, 30, 31, a spring, 55, for moving the latter lever when released by the rocking lever and a support for receiving it when released substantially as and for the purpose set forth.

9. In a sewing machine of the character described and comprising an arcuate needle, means for revolving the needle about its geometrical center, means for arresting the needle after each stitch, two clamping rollers arranged in the path of the needle for tightening the thread after each stitch and means for rotating said rollers; a slide, 18, to engage the needle to arrest the same at the completion of each revolution, a pivoted guide, 19, for said slide means for adjusting the position of the slide relatively to the needle path, a rocking lever, 79, 81, means for rocking said lever and a rod, 140, connecting said lever to the aforesaid guide, 19, whereby the oscillations of said rocking lever are imparted to

the guide to move the slide out to release the needle and back to arrest it again after it completes its revolution.

10. In a sewing machine of the character described and comprising an arcuate needle, means for revolving said needle about its geometrical center, means for arresting said needle after each stitch, clamping rollers for tightening the thread after each stitch, and means for rotating the rollers; a wedge-shaped guide, 114, for diverting the thread from the needle path, means for supporting said guide adjacent to the needle path, and a guide, 111, for guiding the thread issuing from the material being sewed into a receptacle, 112, and means for supporting said guide adjacent to the aforesaid clamping rollers, substantailly as and for the purpose set forth.

11. In a sewing machine of the character described and comprising an arcuate needle means for revolving said needle about its geometrical center, means for arresting said needle after each stitch clamping rollers arranged in the path of said needle for tightening the thread after each stitch, and means for rotating said rollers; a pusher, 122, for removing the thread from said clamping rollers and means for moving said pusher laterally relatively to the same, substantially as and for the purpose hereinbefore set forth.

12. In a sewing machine of the character described and comprising an arcuate needle, means for revolving said needle about its geometrical center, means for arresting the needle after each stitch, and clamping rollers arranged in the path of the needle to tighten the thread after each stitch a circular series of flanged rollers for guiding the needle.

13. In a sewing machine of the character described and comprising an arcuate needle, adapted to revolve about its geometrical center, means for arresting the needle after each stitch and means for tightening the thread after each stitch means for driving the needle, a brake for retarding said needle driving means, a spring 98 for actuating said brake, a rocking lever, 79, 81 for tensioning said spring means for oscillating the said lever, 79, 81, a swinging lever, 101, connected to said spring, a small locking lever, 102, on said swinging lever, a pivoted lever, 30, 31, adapted to engage therewith for the purpose of retaining the spring in the tensioned condition and to disengage therewith to release the spring, substantially as and for the purpose hereinbefore set forth.

14. In a sewing machine of the character described, and comprising an arcuate needle means for revolving said needle about its geometrical center, means for arresting said needle after each stitch and clamping rollers arranged in the path of the needle for the purpose of tightening the thread after each stitch; a strap, 15, for connecting the thread to the needle, a member, 12, for connecting the strap to the needle, and a pivotal connection between said member, 12, and the needle substantially as and for the purpose hereinbefore set forth.

15. In a sewing machine of the character described and comprising an arcuate needle, means for revolving said needle about its geometrical center, means for arresting said needle after each stitch, clamping rollers arranged in the path of the needle for tightening the thread after each stitch, and a strap connected to the needle; means for attaching the thread to the strap consisting of a vise, 116, comprising two fixed cheeks, a tongue, 117, pivoted between said cheeks and an eye therein to receive the thread.

16. In a sewing machine of the character described and comprising an arcuate needle means for revolving the needle about its geometrical center means for arresting said needle after each stitch, clamping rollers arranged in the path of the needle for tightening the thread after each stitch, one roller being displaceable relatively to the other, a spring acting on said roller, a brake for arresting the needle driving means a spring for operating said brake, a rocking lever, 79, 81, for energizing the aforesaid springs, an oscillating thread pusher 122, for removing the thread from the clamping rollers, a basket for the thread, rotating blades, 113, therein for laying the thread in position; a shaft for operating said lever, 79, 81, said pusher, 122, and said blades, 113, and means for rotating said shaft one revolution at a time.

17. In a sewing machine of the character described and comprising an arcuate needle, means for revolving the needle about its geometrical center, means for arresting the needle after each stitch, clamping rollers arranged in the path of the needle for tightening the thread at the end of each stitch, one of said rollers being relatively displaceable to the other a spring for thrusting each roller against the other, a lever 79, 81, for compressing said spring, a shaft, 83, for oscillating said lever, 79, 81, a second shaft for operating the needle driving means, a third shaft, 137, constantly rotating clutches on said third shaft, 137, adapted to connect it with gearing driving the aforesaid shafts, means for operating said clutches, a pivoted lever, 30, 31, supporting the clamping rollers, said clutch operating means being actuated by said lever, 30, 31, substantially as and for the purpose set forth.

18. In a sewing machine of the character described and comprising an arcuate needle, means for revolving said needle about its geometrical center, means for arresting the needle after each stitch, and clamping rollers arranged in the path of the needle to tighten

the thread after each stitch, a pivoted lever for supporting said rollers, two operating shafts, 83 and 8, a main shaft, 137, clutch members loose on the latter and adapted to drive the aforesaid shafts, a clutch member drivingly connected with the shaft, 137, a lever, 149, 150, for moving said member into engagement with either of said clutch members or into a neutral position, springs 157, 160, acting in said lever in opposite directions, means operated by the shaft, 83, for tensioning said springs simultaneously and means for releasing said springs said means being operable from the aforesaid pivoted lever supporting the clamping rollers, substantially as and for the purpose set forth.

19. In a sewing machine of the character described and comprising an arcuate needle, means for revolving said needle about its geometrical center, means for arresting the needle after each stitch, clamping rollers arranged in the path of the needle for tightening the thread after each stitch; an operating shaft, 83, and means for insuring one exact revolution of the same at a time comprising a disk, 183, on said shaft, a bell-crank lever, 187, 188, pivoted on said disk on a pivot eccentric to the center thereof, a roller for engaging the end of the one arm, 187, of said lever, a pivoted locking lever, 192, carrying said roller, tappets, 189, 190, on the aforesaid disk, a lever, 199, a link, 198 connecting said lever to one arm, 188, of the aforesaid bell-crank lever, a stop for limiting the movement of the lever, a pivoted lever, 30, 31, for carrying the aforesaid clamping rollers and a connection from the same to the locking lever, 192, substantially as and for the purpose hereinbefore set forth.

In testimony whereof, I have signed my name to this specification in the presence of two subscribing witnesses.

KARL HELLVOIGT

Witnesses:

BESSIE F. DUNLAP,

LOUIS VANDORN.