April 7, 1931. G. J. GILHET 1,799,226

MECHANICAL LOOM FOR WEAVING WILTON AND OTHER CARPETS

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Fig.1

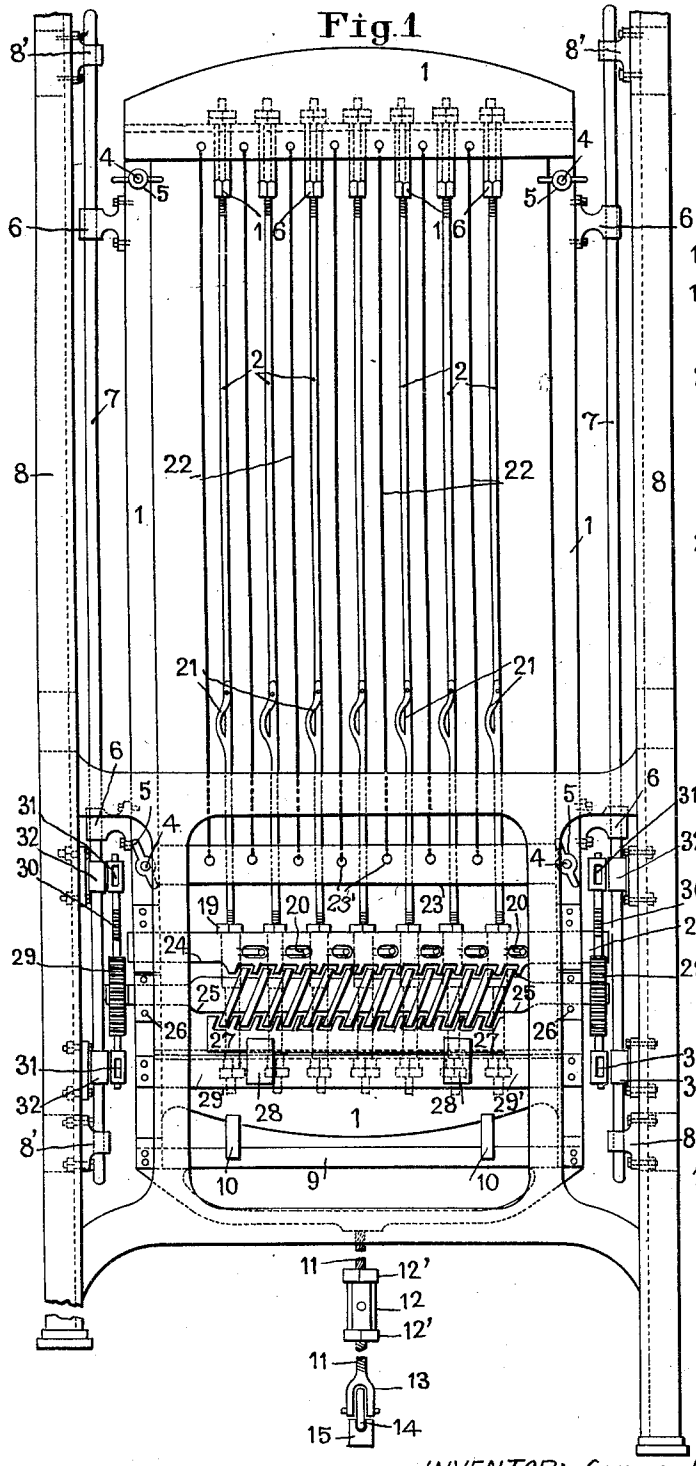
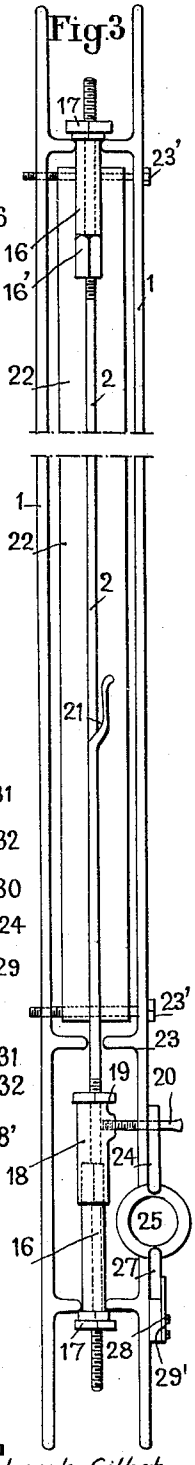


Fig.3



INVENTOR: Georges Joseph Gilhet

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Fig 2

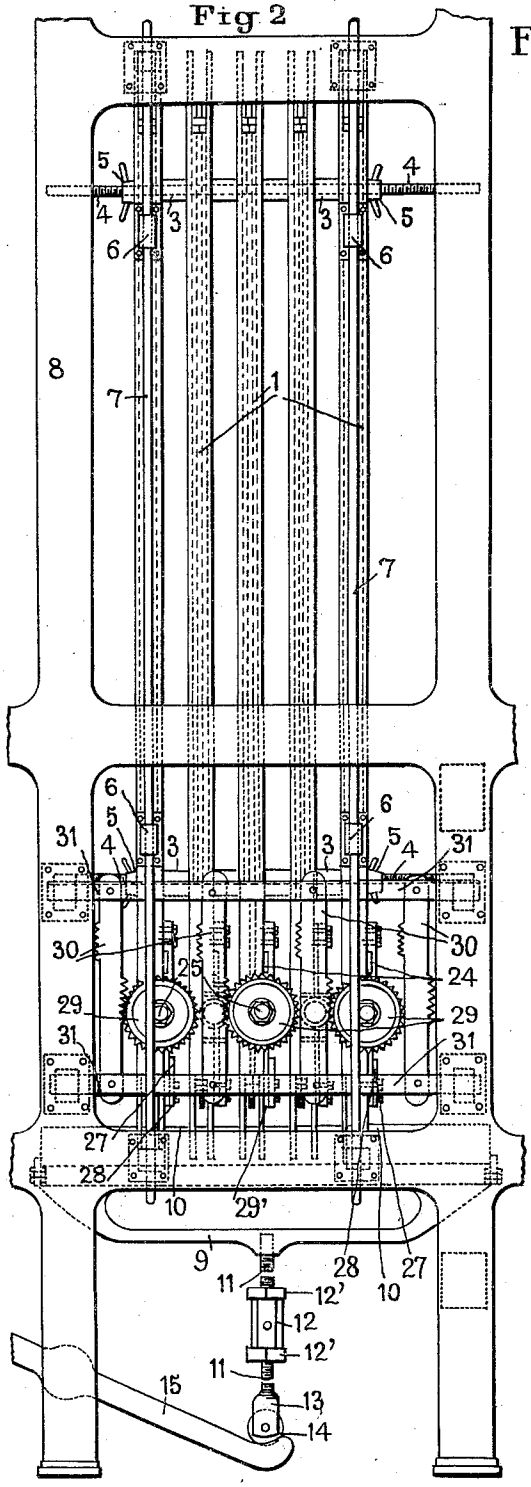


Fig.4

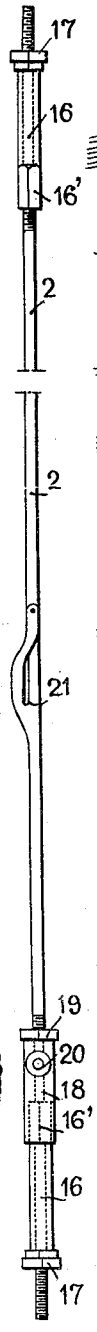


Fig.5

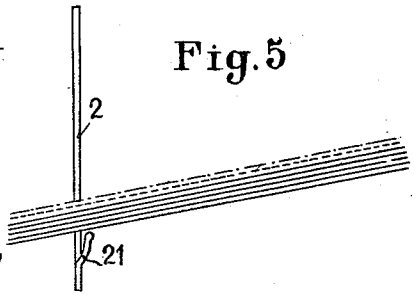


Fig.6

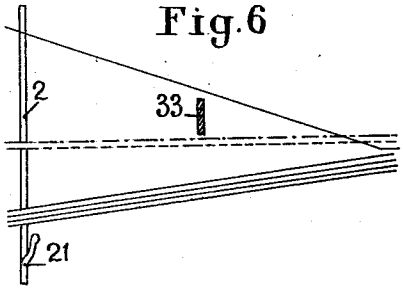


Fig.7

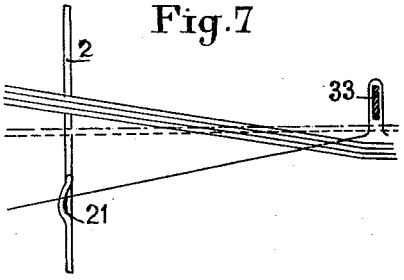


Fig.8

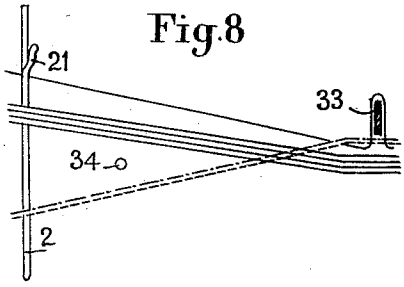
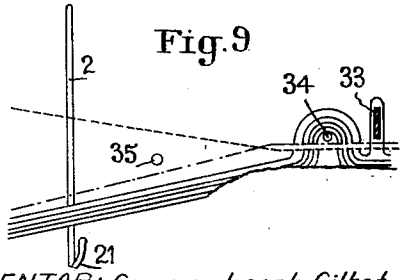


Fig.9



INVENTOR: Georges Joseph Gilhet

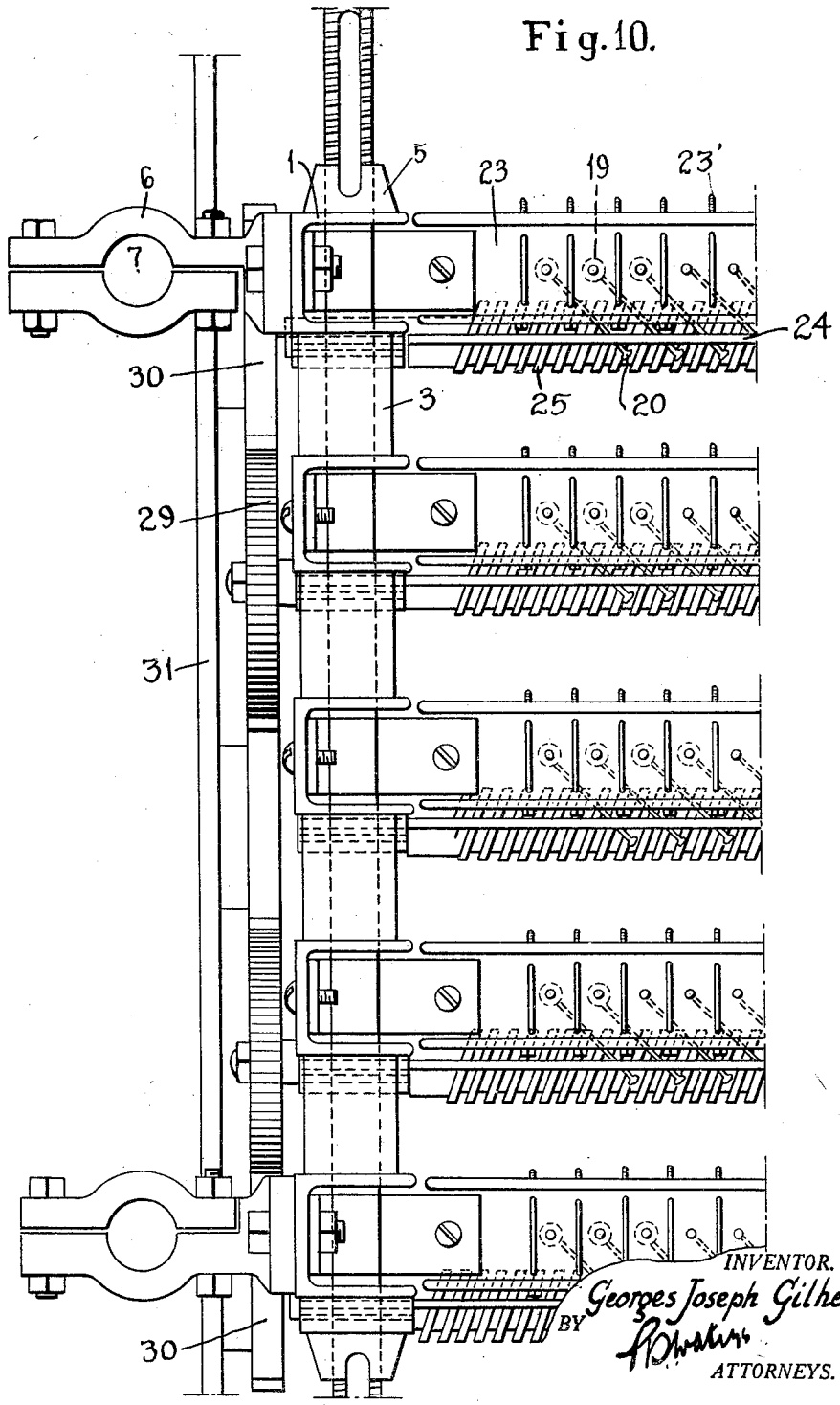
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Fig. 10.



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Patented Apr. 7, 1931

1,799,226

UNITED STATES PATENT OFFICE

GEORGES JOSEPH GILHET, OF PARIS, FRANCE

MECHANICAL LOOM FOR WEAVING WILTON AND OTHER CARPETS

Application filed February 15, 1929, Serial No. 340,174, and in France February 22, 1928.

The present invention relates to an arrangement which can be applied to mechanical looms adapted for weaving Wilton and other carpets and which permits a velvet cloth with a peculiar looped stitch somewhat similar to the knotted stitches of Oriential carpets on one face, but differing from these latter in that the design appears the same on the two sides of the cloth or carpet.

The present arrangement is constituted essentially by a group of metallic frames carrying a large number of needles, the frames being limited by the space available between the driving shaft and the crank arm and the sley itself—whatever may be the width of the loom, these frames being a function of the fineness of the cloth which it is desired to obtain.

In the annexed drawings:

Figures 1 and 2 represent side and end elevations, respectively, of the mechanism mounted on a loom for weaving ordinary carpets.

Figure 3 is an end elevation of a frame carrying a complete mounted needle illustrating the control of the needles and a flexible partition.

Figure 4 shows a needle having special nuts and lock nuts.

Figures 5, 6, 7, 8 and 9 represent various phases of the formation of a looped stitch peculiar to the invention.

Figure 10 is a partial elevation made at a larger scale.

In Figures 5–9 the backing threads or stuffer warps are represented by broken lines, the binding warps by dotted lines and the pile threads by full lines.

Independent frames 1 (Figures 1 and 2) not very thick, placed one behind the other and separated by spacing collars 3 are assembled by tightening rods 4, the ends of which are threaded. A wing nut 5 at each end tightens up the whole and thus ensures a rigid assemblage and a rapid dismounting in case of repairs being necessary to any parts.

These frames undergo an alternating upward and downward movement, two of them, preferably the end frames, are attached to split bearings 6 which are capable of rapid dismounting and which slide on guiding rods 7 fixed by means of collars 8′ on the frames 8 of the loom.

The group of frames 1 above mentioned rests on a vertically slidable base 9 which has two longitudinal runners 10 serving as guide rails for the necessary displacement of the frames in case of repairs.

This base 9 receives at its centre a vertical spindle 11 which has two threaded parts, one having a right-handed thread and the other having a left-handed thread. These two parts are connected by a special nut 12 and lock nut 12′. The lower part of spindle 11 has a fork 13 carrying a roller 14 making contact with the shaped end of a lever 15 controlled by a suitable eccentric which is actuated by the lifting spindle of the comber board of the loom (not shown), an upward movement being thus obtained while the vertical downward movement is obtained by the weight of the frames 1 themselves, the roller 14 being constantly in contact with the lever 15 which communicates to it the upward movement.

The frames 1 carry special steel needles 2 threaded at the ends and attached thereby to these frames 1 by special nuts 16 and lock nuts 17.

Engaging the upper end of the lower nut 16 which is in the form of a square 16′ (Fig. 4) is a sleeve 18 held in position by a lock nut 19, said sleeve 18 being bored and threaded to receive a small threaded stop pin 20 having a spherical end, which pin serves for the manipulation of the needle 2 in the various positions which it takes up during the work.

At a suitable height each needle 2 carries a hook 21, flexible partitions 22 dividing the groups of threads between the needles and being fixed to the upper horizontal part of the frame 1 and to a transverse stay 23 by threaded cross bolts 23′.

The manipulation of the needles is effected by the stop pins 20 which engage the sliding plates 24 having elongated holes receiving said pins 20. The lower part of plate 24 is cut (Figure 1) to correspond to the

thread of the controlling screw 25 which is situated underneath and fixed to the frame by bearings 26. The controlling screw 25 engages throughout the length thereof a plate 27, in order to support said screw and prevent bending thereof. Plate 27 is cut on its upper edge similarly to plate 24 but is shorter and free to slide, being held in place by stops 28 and sliding on a straight edge 29', fixed to the frame 1. At the end of the screw 25 is keyed a toothed pinion 29 which engages racks 30 of the same pitch.

These racks 30 are pivotally mounted on longitudinal bars 31 which are fixed to the frame 8 of the loom by brackets 32 (Fig. 1) which may be disengaged and form bearings to permit the rapid displacement of the racks thereby disengaging said racks 30 and pinions 29 controlling the needles. The group of frames is then left free for dismounting and necessary repairs.

The racks 30 are provided on each side with a number of teeth calculated to give to the needles only the rotating movement necessary, one quarter of a turn, either forwards or backwards, the teeth being omitted corresponding to the period during which the needles are stationary.

In view of the diameter of the pinions 29 with respect to the small space between each frame, the pinions 29 and their racks 30 have been placed alternately on each side of the group of frames 1 and interposed thus: first frame, pinion to the right, second frame, pinion to the left and so on. In this way space is provided to allow for the diameter of the pinions as well as to obtain an equilibrium of the controlling movement.

When the group of frames 1 is raised by the lifting spindle, transmitting its movement to the lever 15 and to the spindle 11, the pinions 29 engaging with the lower teeth of the racks 30 will transmit, through the screw 25, a forward movement to the plate 24 which carries the controlling rods 20 of the needles 2. The needles 2 will turn by a quarter of a revolution and will then remain stationary on account of the omission of teeth on the rack. Continuing to rise, the pinions 29 will meet the teeth of the opposite rack 30 which will produce a reverse movement of the needles 2. In similar manner as the group of frames 1 falls, the weight of which is sufficient for this purpose, the same movements are transmitted to the needles in opposite directions.

Pursuant to the foregoing explanations, the weaving is effected in the following manner:

1st step—all the threads being stationary. Fig. 5, the jacquard raises the pile thread which is to form the design, Figure 6, giving a raised shed as in the weaving of Wiltons, in order to permit the passage of the wire 33; at the same time as the jacquard raises the pile thread, which is to form the design, the stuffer warps or backing threads and the binding warps are also raised approximately one-half the height of the design thread, these threads form a sheet which is situated at the level of the position of the wires 33 which are to form the plush in the fabric, thus facilitating the entry of the wires. After the wire is passed, the jacquard is allowed to drip to rest; the stuffer warps or backing threads and the binding warps remaining in the same position. During this first period the group of frames is inoperative.

2nd step—the jacquard now raises all the pile threads, which have not been raised the first time, to the height of the stuffer warps or backing threads and binding warps, leaving below the thread which has formed the plush with a slight restraint on the lifting of the jacquard. The group of frames 1 containing the needles then enters into movement raised by its lever from below upwards, the pinion engaged in the rack 30 will transmit through the screw 25 a sliding movement to the plate 24 controlling the needles causing these to turn a quarter of a revolution, placing their hooks 21 in a position to hook up the pile threads which have formed the design. The group of frames continues its upward movement, the rack having no more teeth, the needles 2 remain constant, the hook 21 then meets the pile thread which has formed the plush (Fig. 7).

At this moment the pinion 29 meeting in its passage the opposite rack 30 will return back, transmitting to the needles a reverse movement and thus placing the hook 21 in a position to traverse the sheet of threads (Figs. 7 and 8) previously raised by the jacquard, said reverse movement stopping when the bottom of the hook 21 of the needle reaches the level of the sheet of threads. The group of frames 1 having reached the maximum of its upward movement, then has a period of rest, controlled by the usual eccentric not shown. With the rising of the group of frames there coincides the drop to rest of the stuffer warps and binding warps by the ordinary weaving means.

The falling of the stuffer and binding warps and the work of the group of frames previously explained during its ascent, the passage of the weft 34 having taken place during the interval of rest, are thus forming the peculiar looped stitch causing the design to appear on the reverse side of the cloth.

Once the weft is passed (Fig. 8), the group of frames descends to its starting point carrying out reverse movements to those executed in rising. With a slight retardation the jacquard or the comber board drops the pile threads to their starting position.

3rd step—the binding warps are raised leaving at rest the stuffer warps or backing threads and the pile threads, the weft 35 is

passed, (Figure 9), the binding warp drops to its starting point by the usual weaving means and then the first stage recurs.

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

1. A loom for the mechanical weaving of carpets comprising a plurality of frames laterally adjacent to each other in the direction of the length of said loom, a plurality of hooked needles arranged by groups in said frames, actuating means imparting an up and down motion to said frames and second actuating means simultaneously imparting an intermittent and reverse rotary movement to said needles around their longitudinal axis.

2. A loom for the mechanical weaving of carpets comprising a plurality of frames laterally adjacent to each other in the direction of the length of said loom, guiding columns attached to said loom and engaging said plurality of frames, a threaded spindle adjustable in length and screwed into the lower portion of said frames, a roller mounted in the lower end of said spindle, a lever pivotally mounted on said loom and adapted to actuate the corresponding roller, spindle and frame, actuating means imparting an up and down motion to said frames and second actuating means simultaneously imparting an intermittent and reverse rotary movement to said needles around their longitudinal axis.

3. A loom for the mechanical weaving of carpets having a plurality of frames laterally adjacent to each other and adapted to be vertically slidable, a plurality of needles each having a hook and being rotatably mounted in said frames, a sleeve and a pin positioned on each needle, sliding plates each provided with a plurality of slots and receiving the pins of the needles of a single frame, means reciprocally actuating said sliding plates horizontally, an actuating means imparting an up and down motion to said frames and second actuating means simultaneously imparting an intermittent and reverse rotary movement to said needles around their longitudinal axis and flexible partitions between the several needles of each of said frames.

4. A loom for the mechanical weaving of carpets having a plurality of frames laterally adjacent to each other and adapted to be vertically slidable, a plurality of needles each having a hook and being rotatably mounted in said frames, a sleeve and a pin poitioned on each needle, sliding plates each provided with a plurality of slots and receiving the pins of the needles of a single frame, means reciprocally actuating said sliding plates horizontally each comprising a screw rotatably mounted in said frame and engaging notches provided on said sliding plate, a pinion positioned on said screw and a rack having teeth corresponding to the desired rotation of said needles, the racks being adjustably attached to said loom, and an actuating means imparting an up and down motion to said frames and second actuating means simultaneously imparting an intermittent and reverse rotary movement to said needles around their longitudinal axis.

5. A loom according to claim 4 having balancing plates symmetrically arranged relatively to said sliding plates and provided with notches engaging said screws.

6. A loom according to claim 4 having nuts and lock nuts allowing rotation and vertical adjustment of said needles with respect to said frames.

In testimony whereof, I have hereunto set my hand at Paris this 5th day of February, 1929.

GEORGES JOSEPH GILHET.