Nov. 27, 1928. 1,693,267

J. E. BERGLIND

RUG MAKING MACHINE

Filed March 20, 1926

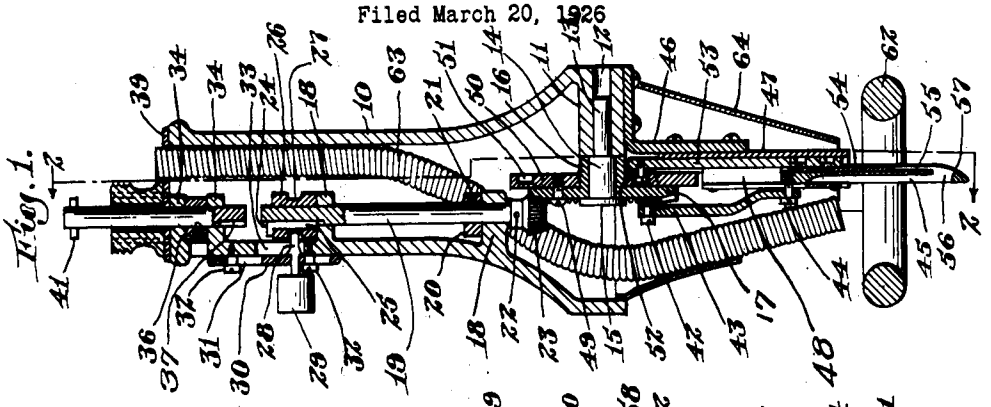


Fig. 1.

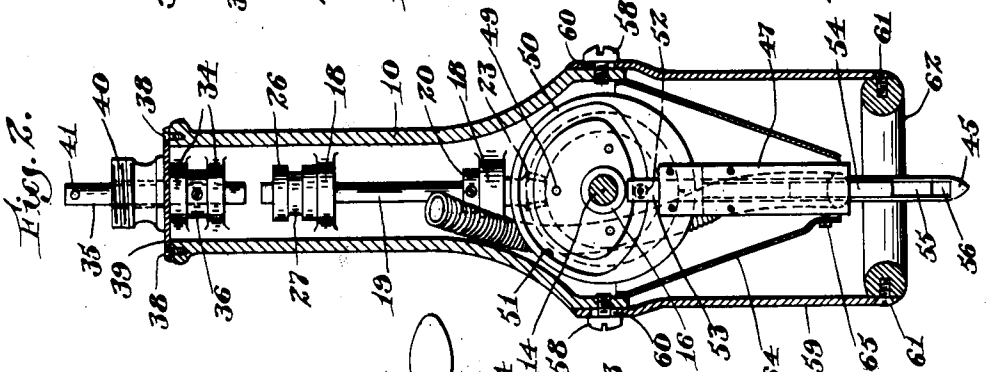


Fig. 2.

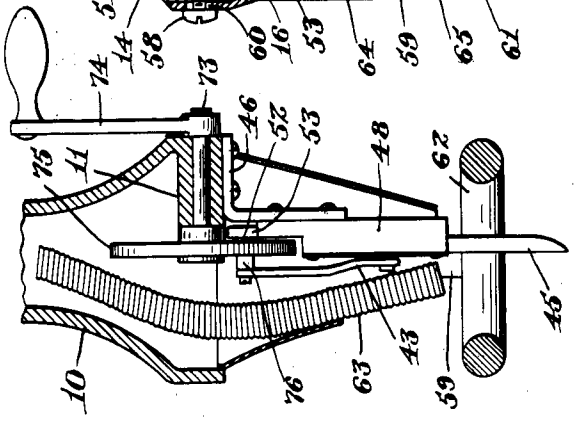


Fig. 3.

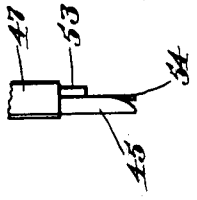


Fig. 4.

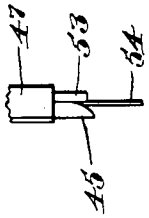


Fig. 5.

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UNITED STATES PATENT OFFICE.

JOHN E. BERGLIND, OF SOUTH ACTON, MASSACHUSETTS.

RUG-MAKING MACHINE.

Application filed March 20, 1926. Serial No. 96,341.

My present invention relates to rug making devices and more particularly to an improved device for making rugs of the well-known "hooked" type.

Heretofore hooked rugs have been manufactured by stretching a base fabric, such as burlap or any other suitable comparatively loose woven material, on a frame. The design of the rug to be made is then drawn on the stretched base fabric and the design is worked into the fabric by means of a hand-operated hook. The person making the rug pushes the hook through the fabric and engages on the reverse side of said fabric a yarn, roving, cord made of twisted fabric or any other suitable material it is desired to hook into the mat or rug and pulls a loop thereof through the base fabric with the hook. The extent to which the loop is drawn through the base fabric is a matter of choice but it is to be noted that the design, as worked by the loops, obliterates the design marked on the base fabric. The operation is extremely slow and tedious and it takes weeks and even months of patient labor to produce even a relatively small rug.

In my development of this art, I have endeavored to obviate the objections to prior methods of operation and have produced a machine or device whereby the tedious hand labor heretofore necessary is entirely obviated. My improved device is in the nature of an automatic looping machine, the looping device either being manually or power operated. In carrying out my invention, I associate a needle and loop holding device and provide means for reciprocating the same in predetermined relation to each other and provide the needle with a contour that enables said needle to act as a feeding means for the entire device. By means of my device the loop made by the needle may be varied as desired and the design on the base fabric is worked as in prior methods but the device as finally placed on the base fabric is on the opposite side of such fabric from the design, and is therefore radically different from the procedure in prior methods of operation.

The principal object of my invention, therefore, is an improved rug hooking machine.

Another object of my invention is an improved feeding arrangement for rug hooking devices.

A further object of my invention is an improved automatically operated rug hooking device.

Other objects and novel features of construction and arrangement of parts comprising my device will appear as the description of the invention progresses.

In the accompanying drawings illustrating the preferred embodiment of my invention, Fig. 1 is a sectional side elevation of one form of my device;

Fig. 2 is a sectional front elevation on the line 2—2 of Fig. 1;

Fig. 3 is a fragmentary sectional elevation of the lower portion of a modification of my device;

Fig. 4 is a side elevation of the needle and loop holder in one position, and

Fig. 5 is a side elevation of the needle and loop holder in a different position.

Referring to the drawings, and particularly to Figs. 1 and 2, 10 designates a combined enclosing case and handle, this member being hollow and provided at its lower open end with a substantially radially and inwardly extending member 11. This portion 11 is drilled at 12 to receive as a driving fit the reduced end 13 of a shaft 14, such shaft 14 being provided on its outer end with a flange 15. Rotatably mounted on the shaft 14 between the flange 15 and the inner face of the member 11 is a hub 16, this hub having formed integral therewith and at the inner end thereof a bevelled gear 17 of any suitable pitch and diameter. Formed integral with the casing 10 on the inner face thereof and in alignment with each other are bearing lugs 18, these bearing lugs being drilled to receive a shaft 19, this shaft being rotatably mounted in the bearing lugs. Adjacent to the lowermost lug 18 and surrounding the shaft 19 is a collar 20, this collar being secured to the shaft 19 by a set screw 21. Secured to the lower end of the shaft 19 by a pin 22 is a bevelled pinion 23 which meshes with and drives the bevel gear 17 above referred to. The upper end of the shaft 19 is provided with a key-way 24, in which is slidably mounted a key 25, that in turn is secured to a sleeve 26 slidably mounted on the shaft 19 above the upper lug 18. The sleeve 26 is provided intermediate its ends with a circumferential groove 27 in which fits a pin 28 that has secured to its outer end a knurled button or head 29. This pin 28 ex-

tends through and is secured to a plate 30, this plate being provided with a pair of spaced elongated slots 31. Through these slots and into the body 10 extend screws 32. The body 10 is also provided with a slot 33 and through which extends the pin 28. By this construction I am enabled to move the sleeve 26 and, therefore, the key 25 axially with respect to the shaft 19 while yet insuring that the key 25 will rotate with said shaft. The upper end of the body 10 is provided with a pair of spaced lugs 34 similar to the lugs 18 and these lugs are drilled to receive as a rotating fit a shaft 35 in axial alignment with the shaft 19. Between the lugs 34 and on the shaft 35 is secured a sleeve 36, which prevents axial movement of the shaft 35 in the lugs 34 while yet permitting rotation thereof. The lower end of the shaft 35 is provided with a key-way 37, adapted to receive the key 25 when said key is moved toward the end of the shaft 19 by the sleeve 26, the key 25 in connection with the key-way 37 acting as a clutch member for connecting shafts 19 and 35 together. Screwed to the upper open end of the body 10 by screws 38 is a cover plate 39 and secured to said plate and surrounding the shaft 35 is a threaded member 40 and by means of which a flexible driving shaft may be associated with the shaft 35, this shaft 35 being provided with a transversely extending pin 41 for this purpose.

On the body of the bevelled gear 17 and eccentrically mounted with regard to the shaft 14 is a crank pin 42. Pivotally attached to the crank pin 42 is one end of a connecting rod 43, the other end of this connecting rod being pivotally attached at 44 to a needle 45. Secured to the body 10 and to the under face of the portion 11 is a bracket 46 and to the downwardly extending portion of this bracket is secured a casing 47. This casing 47 is provided with a slideway 48 in which is mounted for reciprocation the needle 45. Secured to the bevelled gear 17 by screws 49 and on the opposite face from the pinion 23 is a circular plate 50, in which is formed a cam race 51. Fitting into said cam race is a cam roller 52 secured to one end of a sliding bar, this bar being slidably mounted in the casing 47. Secured to the lower end of the bar 53 is a loop holding tool 54 which is slidably mounted in a groove 55 formed on one face of the needle 45. This needle 45 is provided with an eye 56 and by reference to the drawing it will be noted that one face of the needle 45 is rounded or bevelled as indicated at 57.

Secured to opposite sides of the member 10 by screws 58 and depending downwardly therefrom are bars 59. The upper ends of these bars are provided with elongated slots or grooves 60 to enable the bars to be moved vertically upward or downward with respect to the member 10. Secured to the lower ends of the bars 59 by screws 61 is an annular ring 62. The distance the needle 45 extends below the annular ring 62 determines the size of the loop made by the machine.

The plate 39 is perforated to allow the passage therethrough of a flexible tubing 63, this tubing passing downwardly through the casing 10 and terminating at a point adjacent to the needle 45 and above the annular ring 62. In the form of the device shown in Figs. 1 and 2 I have illustrated a substantially cone-shaped member 64 attached to the casing 47 by a screw 65 but this may be omitted if desired although the same is useful as a means for preventing access of dirt or other substances to the mechanism above described. The cam race 51 is so proportioned with regard to the crank arm 42 that when the needle 45 occupies with relation to the looping holding device 54 the position shown in Fig. 5, further rotation of the bevelled gear 17 will cause a downward movement of the needle 45 without perceptible movement of the loop holding device 54 so that the said two devices will be brought into the position shown in Fig. 4 and further downward movement of the needle 45 will be associated with a corresponding and upward movement of the loop holding device 54.

Referring now to Fig. 3, there is shown the casing 10 having the member 11 formed at its lower end but in such member 11 is rotatably mounted a shaft 73, this shaft being provided on its outer end with a crank handle 74 and on its inner end with a circular plate 75. On one face of the plate 75 is formed a cam race similar to the cam race 51 and to the opposite face and eccentrically mounted is a crank pin 76. The cam race (not shown) and the crank pin 76 drive mechanism similar to the mechanism above described with reference to Figs. 1 and 2 and, therefore, such mechanisms need not be further described. With the mechanism shown in Fig. 3 I am enabled to dispense with the shafts 19 and 35 and all attached and associated parts as described with reference to said Figs. 1 and 2 and, therefore, the device shown in Fig. 3 is strictly a hand-operated device.

In the operation of the device, the base fabric is stretched on a frame as is usual, the design is placed on the reverse side thereof, and the material it is desired to hook into the rug is fed downward through the tubular member 63 and through the eye 56 of the needle 45. If the device employed is that illustrated in Figs. 1 and 2, the operator connects the shaft 35 to suitable driving mechanism and by pushing the button 29 brings the key 25 into association with the key-way 37. By placing the device with the needle 45 in the proper place on the design, the same is utilized to feed and loop the material onto the base fabric and if the device is put onto the base material in the position shown in Fig. 1, the rounded or bevelled portion 57 of the needle 45 will

cause a step-by-step movement of the entire device to the left, as viewed in said figure. The design will be worked into the base fabric with the loops on the obverse side or on the side opposite to that on which the design is drawn.

By means of my device I am enabled to produce a hooked rug of satisfactory quality in a small fraction of the time heretofore necessary by prior methods.

While I have necessarily shown the preferred form of my invention somewhat in detail, it is to be understood that I may vary the size, shape and arrangement of parts comprising the device without departing from the spirit of the invention.

Having thus described my invention, what I claim as new is:—

1. In a rug making machine, the combination of a base, a needle and a loop holding device mounted in the base for reciprocating movement therein, a shaft rotatably mounted in the base, means for rotating said shaft, a crank secured to said shaft, a connecting rod connecting said crank and the needle, a cam secured to said shaft, a roller attached to said loop holding device, said cam and roller maintaining said loop holding device substantially at rest with respect to said needle during a predetermined portion of the travel of said needle.

2. In a rug making machine, the combination of a base, a needle and a loop holding device mounted in the base for reciprocating movement therein, a shaft rotatably mounted in the base, means for rotating said shaft, a crank secured to said shaft, a connecting rod connecting said crank and the needle, a cam secured to said shaft, a roller attached to said loop holding device, said cam having a dwell therein arranged to maintain the loop holding device in its lowermost position with respect to said needle during a predetermined portion of the travel of the said needle.

In testimony whereof, I have signed my name to this specification, this 15th day of March, 1926.

JOHN E. BERGLIND.