

March 11, 1924.

1,486,220

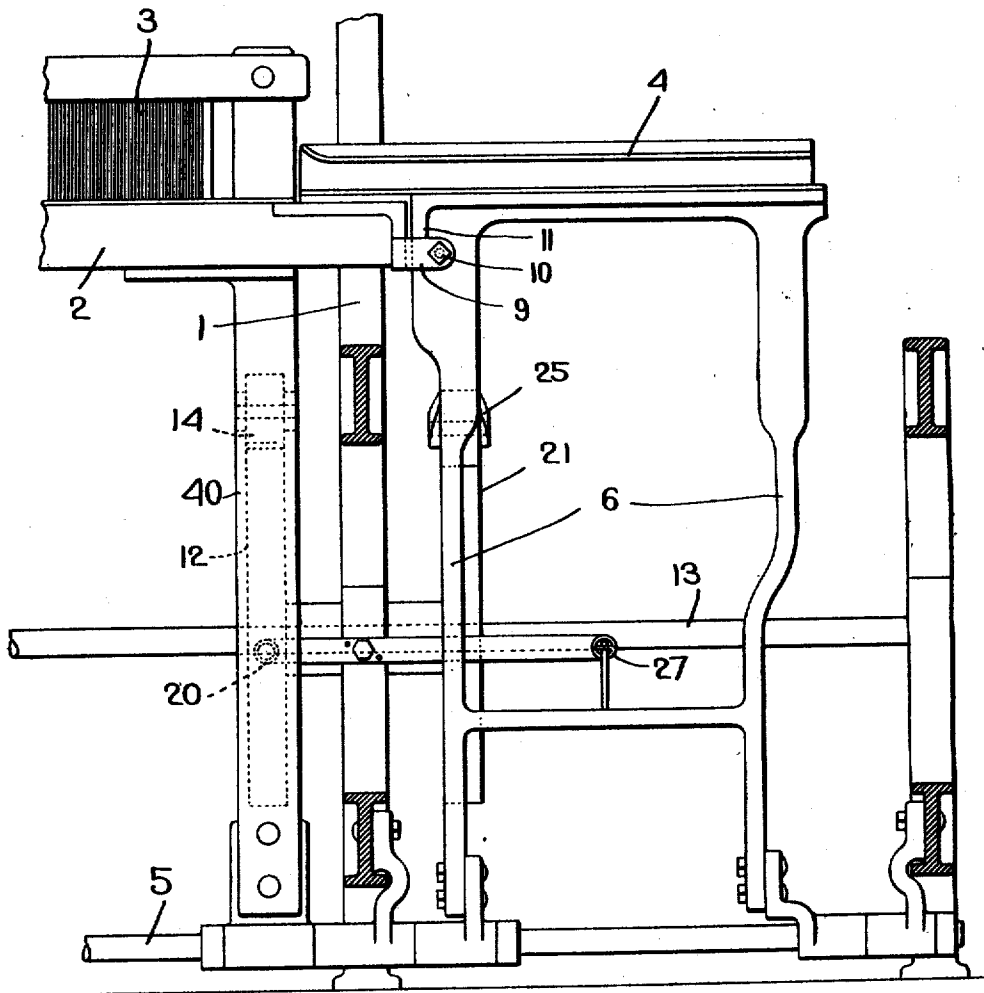
J. F. BENOIT

PILE FABRIC LOOM

Filed June 4, 1923

2 Sheets-Sheet 1

Fig.1.



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FILE FABRIC LOOM

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Fig.3.

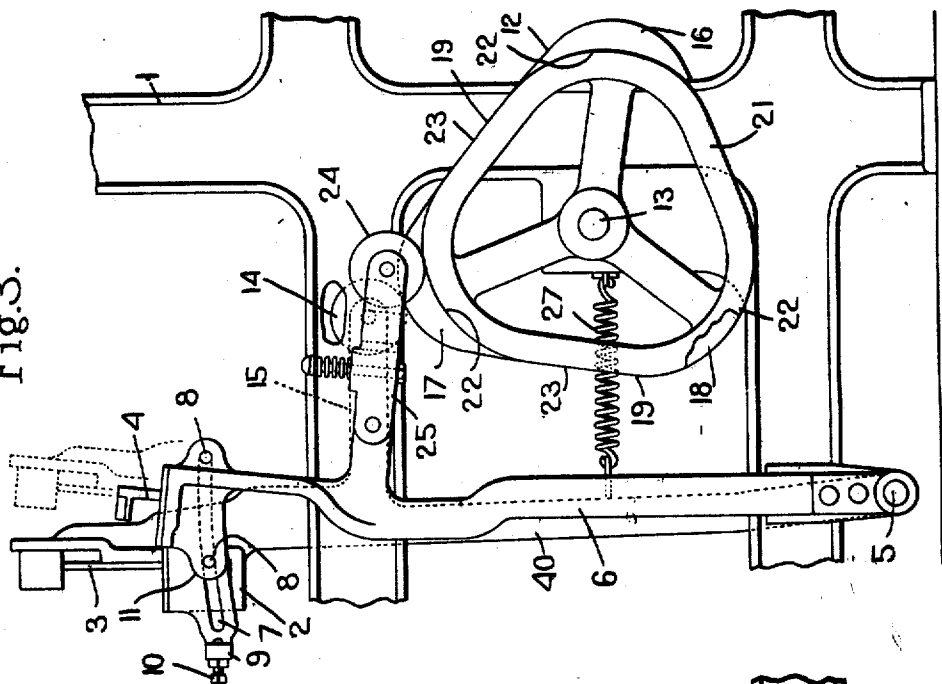
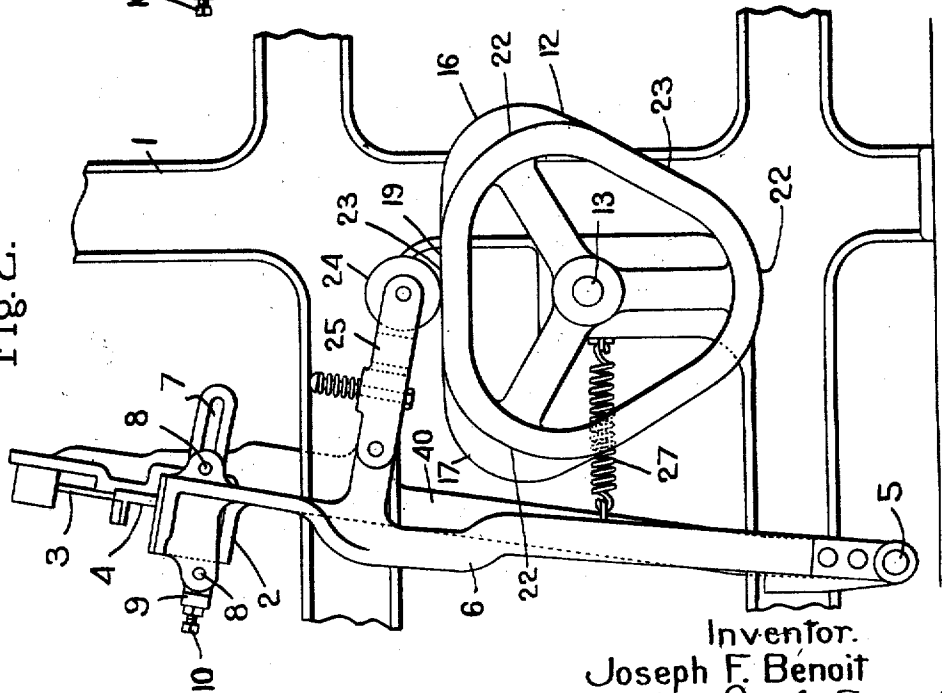


Fig.2.



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UNITED STATES PATENT OFFICE.

JOSEPH F. BENOIT, OF SANFORD, MAINE, ASSIGNOR TO SANFORD MILLS, OF SANFORD, MAINE, A CORPORATION OF MAINE.

PILE-FABRIC LOOM.

Application filed June 4, 1923. Serial No. 643,287.

To all whom it may concern:

Be it known that I, JOSEPH F. BENOIT, a citizen of the United States, and resident of Sanford, county of York, State of Maine, have invented an Improvement in Pile-Fabric Looms, of which the following description, in connection with the accompanying drawing, is a specification, like characters on the drawing representing like parts:

This invention relates to a pile fabric loom in which pile wires are employed for forming the pile. In this class of looms it is customary to so support the shuttle box on the side of the loom on which the wire motion is located that said shuttle box may have a movement relative to the lay and to provide means whereby during the forward movement of the lay said shuttle box will have less movement than the lay so that when the lay is at its extreme forward position the shuttle box will be in a position behind the lay thus giving clearance room for the insertion and withdrawal of the pile wires, and the present invention relates to a pile fabric loom of this type.

In making of some pile fabrics the loom is arranged to insert a certain number of picks of filling thread and then at the next pick to insert a pile wire, there being in the fabric as it is formed one or more picks of filling between each two adjacent pile wires.

In the operation of a loom of this type it is desirable that the lay should beat the fabric up tightly after the insertion of each pick of filling but as the pile wire is larger than the filling and only remains in the fabric temporarily it is an advantage to have the lay make a forward stroke of less amplitude in beating up the pile wire than in beating up the filling.

One of the objects of my invention is to provide a loom operating in this way and I have herein provided a mechanism for vibrating the lay and the shuttle box on the side of the loom on which the wire motion is located so that after each filling-inserting pick the lay will have its maximum amplitude of beating-up movement while after each wire-inserting pick the lay will have a less amplitude of beating-up movement. In this way the warp threads are maintained under uniform tension and a superior fabric is produced.

In order to give an understanding of the invention I have illustrated in the drawings

a selected embodiment thereof which will now be described after which the novel features will be pointed out in the appended claims.

Fig. 1 is a fragmentary sectional view showing in front view one end of a lay and the shuttle box at said end, this being the end of the lay on which the wire motion is supported;

Fig. 2 is a side view showing the lay and shuttle box in their rearward position;

Fig. 3 is a similar view showing the forward position of the lay and shuttle box after each filling-inserting pick.

In the drawings 1 indicates a portion of a loom frame, 2 is the lay having the usual reed 3 thereon and 4 is the shuttle box at the side of the lay on which the wire motion is located. The lay is supported by the usual lay swords 40 which are carried on the rock shaft 5. The shuttle box 4 is mounted on a swinging support 6 which in turn is pivotally mounted on the rock shaft 5, said shuttle box being thus supported independently of the lay so that it has a movement relative thereto.

The lay is herein shown as having at its end a guide slot 7 in which pins projecting from the shuttle box 8 are received, this pin and slot construction serving to guide the lay and shuttle box during their relative movement. The lay is also shown as having a stop projection 9 extending laterally therefrom which is illustrated as carrying a stop screw 10 with which the portion 11 of the shuttle box co-operates to limit the forward movement of the shuttle box relative to the lay.

The parts thus far described are or may be all as usual in pile wire looms of this type and form no part of my present invention which relates to the manner of operating the lay and shuttle box and controlling the relative movements thereof.

The lay is given its vibrating movement by a cam device similar to that illustrated in my copending application Serial No. 614,907, filed Jan. 25, 1923. This cam device is in the form of a cam 12 mounted on a cam shaft 13, said cam co-operating with a roll 14 which is carried by an arm 15 extending rearwardly from the lay sword. The cam 12 is illustrated as a three-point cam, it having the three high points 16, 17 and 18 and the intermediate low points 19. As the cam shaft rotates

the engagement of each of the high points 16, 17 and 18 with the roll 14 will swing the lay forward thus giving it its forward beat and as the roll passes from the high point to the low point on the cam during the rotation of the latter the lay is returned to its backward position by means of a spring 20. The shuttle box 4 is given its vibrating movement by a similar mechanism comprising a cam member 21 also mounted on the shaft 13 and having the three high points 22 and the intermediate low points 23. This cam member co-operates with a roll 24 carried on an arm 25 extending rearwardly from the support 6.

27 indicates a spring attached to the frame 6 and which tends to draw the latter rearwardly and holds the roll 24 in operative engagement with the cam 21. As each high portion 22 of the cam 21 passes under the roll 24 the shuttle box will be moved forwardly as indicated in Fig. 3 while when the low portion 23 of the cam 21 comes under the roll 24 the shuttle box will be moved backwardly into the position shown in Fig. 2 by means of the spring 27.

The cam 21 is symmetrical, that is, each of the high points 22 has the same radial distance from the center and, therefore, the shuttle box 4 will be given a uniform beating-up movement.

With relation to the cam 12, however, the high points 16 and 17 have a greater radial distance from the center than the high point 18 and, therefore, as the cam 12 rotates the lay will be given a beating-up movement of greater amplitude by the high points 16 and 17 than by the high point 18.

A cam of this shape is especially designed for use in a pile fabric loom which operates to introduce two picks of filling between each two adjacent pile wires and the loom will be adjusted so that after each filling-inserting pick the lay will be given its forward beat by one of the high portions 16 or 17 of the cam while after each wire-inserting pick the lay will be given its forward movement by the point 18 of the cam which is constructed to give the lay a less amplitude of movement than the points 16 and 17. The relation between the cams 21 and 12 is such that the high points 22 of the cam 21 have a less radial dimension than the high points 16 and 17 of the cam 12 while the radial dimension of the high point 18 of the cam 12 is substantially the same as that of the high points 22 of the cam 21. Therefore, as the cam rotates the shuttle box will at each filling-inserting pick be moved forward a less distance than the lay as shown in Fig. 3 and, will, therefore, be kept clear of the pile wire motion although the lay will have its full amplitude of movement and will thus beat the filling picks up tightly. After the pile wire has

been inserted, however, the forward movement of the lay will be of less amplitude due to the shape of the high point 18 of the cam and, therefore, the wire will not be beaten up so tightly.

I have, therefore, provided means whereby the lay will have a less amplitude of beating-up movement after each pile wire has been inserted than it has after each pick of filling is inserted.

I claim:

1. In a pile-fabric loom constructed to introduce pile wires in the shed at certain picks and filling in the shed at other picks, the combination with a lay, of a shuttle box supported independently of the lay, and lay-vibrating means operating to give the lay a greater amplitude of beating-up movement after the insertion of each filling pick than after the insertion of each pile wire.

2. In a pile-fabric loom constructed to introduce pile wires in the shed at certain picks and filling in the shed at other picks, the combination with a lay, of a shuttle box supported independently of the lay, and lay-vibrating means operating to give the lay a greater amplitude of beating-up movement after the insertion of each filling pick than after the insertion of each pile wire, the shuttle box-vibrating means operating to give the shuttle box a uniform amplitude of movement.

3. In a pile-fabric loom constructed to introduce pile wires in the shed at certain picks and filling in the shed at other picks, the combination with a lay, of a shuttle box supported independently of the lay, and lay-vibrating means operating to give the lay a greater amplitude of beating-up movement after the insertion of each filling pick than after the insertion of each pile wire, the shuttle box-vibrating means operating to give the shuttle box a uniform amplitude of movement which, however, is less than the greater amplitude of movement of the lay.

4. In a pile-fabric loom constructed to introduce pile wires in the shed at certain picks and filling in the shed at other picks, the combination with a lay and its lay sword, of a shuttle box, a swinging support separate from the lay sword for supporting the shuttle box, arms extending rearwardly from the lay sword and frame respectively and two cams co-operating with said arms for vibrating the lay and shuttle box, the lay-vibrating cam being constructed to give the lay a greater amplitude of vibration than the shuttle box vibrating cam.

5. In a pile-fabric loom constructed to introduce pile wires in the shed at certain picks and filling in the shed at other picks, the combination with a lay and its lay sword, of a shuttle box, a swinging support

separate from the lay sword for supporting the shuttle box, arms extending rearwardly from the lay sword and frame respectively and two cams co-operating with said arms for vibrating the lay and shuttle box, the lay-vibrating cam being constructed to give the lay a greater amplitude of vibration than the shuttle box after each filling-inserting pick and the same amplitude of movement after each wire-inserting pick. 10

In testimony whereof, I have signed my name to this specification.

JOSEPH F. BENOIT.