

March 28, 1939.

E. HEFTI

2,152,255

METHOD AND LOOM FOR WEAVING

Filed Oct. 2, 1937

2 Sheets-Sheet 1

Fig. 1.

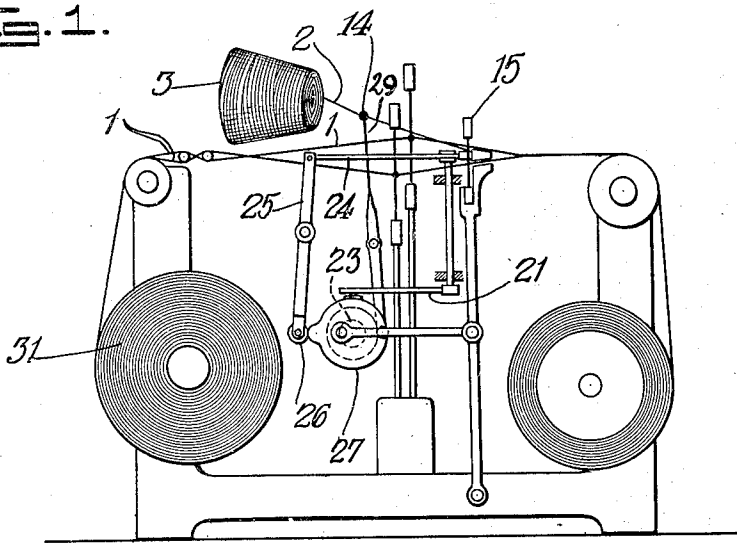
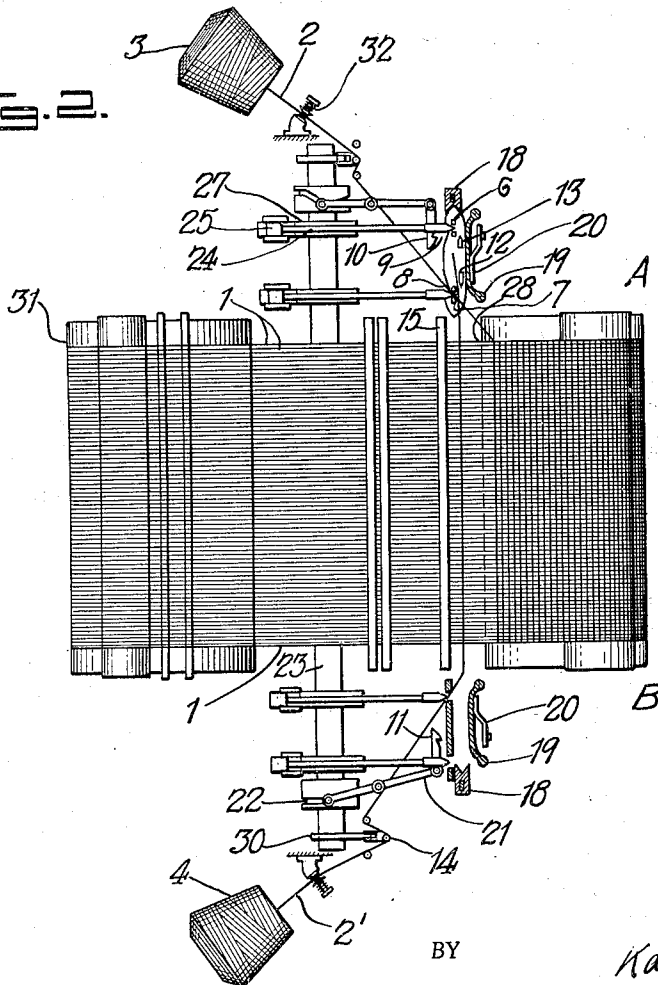


Fig. 2.



INVENTOR.
ERNST HEFTI
Karl A. Mays
ATTORNEY.

March 28, 1939.

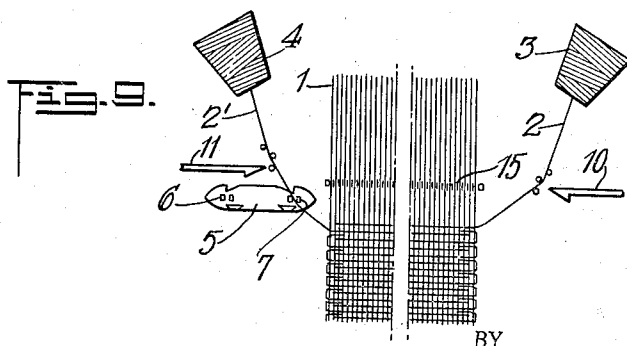
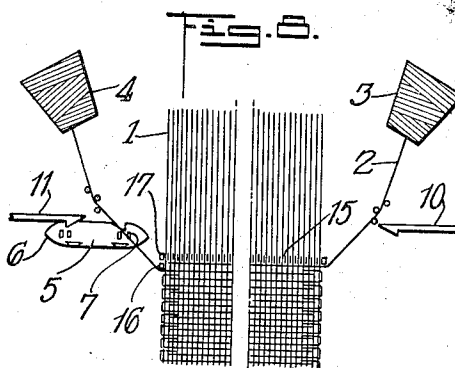
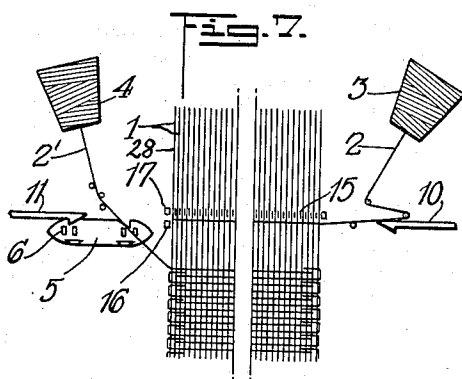
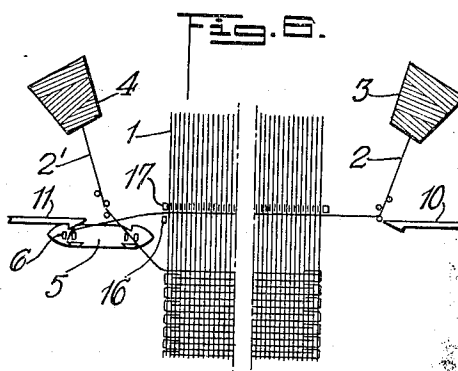
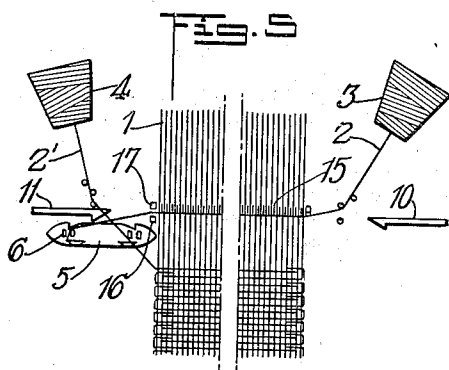
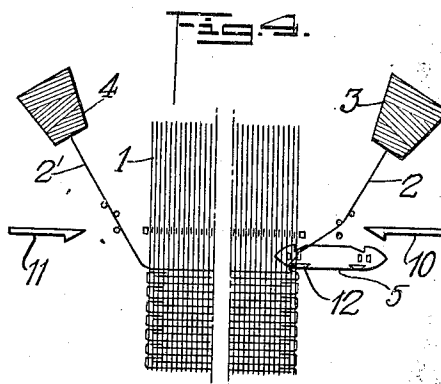
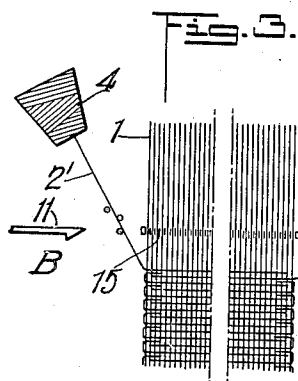
E. HEFTI

2,152,255

METHOD AND LOOM FOR WEAVING

Filed Oct. 2, 1937

2 Sheets-Sheet 2



BY

INVENTOR.
ERNST HEFTI
Karl A. Mayr
ATTORNEY.

UNITED STATES PATENT OFFICE

2,152,255

METHOD AND LOOM FOR WEAVING

Ernst Hefti, Winterthur, Switzerland, assignor to
Gebrüder Sulzer Aktiengesellschaft, Winter-
thur, Switzerland, a corporation

Application October 2, 1937, Serial No. 166,934
In Switzerland October 8, 1936

13 Claims. (Cl. 139—126)

The present invention relates to a method and apparatus for weaving with looms for weaving having stationary spools for the weft threads and gripper shuttles.

5 It is an object of the present invention to provide a method and apparatus for weaving whereby the shuttle, after being caught and stopped and before the weft thread is released from the shuttle, is brought to a predetermined position
10 while constant tension is maintained on the weft thread and whereby, after the weft thread is released from the shuttle, the protruding part of the weft thread is pulled back close to its respective edge of the woven material by means of
15 a weft return mechanism.

It is an object of the present invention to provide a machine for weaving in which by means of a shuttle moving mechanism which moves the shuttle to a predetermined position after it is
20 caught and stopped and before the weft thread is released from the shuttle and while the weft thread is held under constant tension by means of a brake mechanism, and in which machine, by means of a weft thread return mechanism,
25 the weft thread is gripped between the edge of the woven fabric and the weft thread; spool and the weft thread which is stretched in the shed by said shuttle moving mechanism is pulled back to a certain extent.

30 It is another object of the present invention to provide a method and means for moving the shuttle after it is received in the shuttle box and stopped in the direction of its movement into the box to a predetermined position while
35 the tension of the weft thread is maintained constant by means of a brake. The shuttle may also be moved in a direction opposite to the direction of its incoming movement to a predetermined position and the tension is maintained
40 constant by means of a thread return mechanism which is specially provided for this purpose and known per se such as for example a suction means or a resiliently supported eye. The end of
45 the thread released from the shuttle may be retarded and held in position by means of a special apparatus so that it cannot slide back into the shed due to its elasticity. A feeler may be provided adjacent to the end of the shed which
50 feeler adjusts the weft thread return mechanism. The weft retarding means may act also as such feeler. The shuttle may be moved to its picking position by said shuttle moving mechanism. The loop formed by the elastic thread
55 thread return mechanism comes into action.

The weft return mechanism may be provided with clamping jaws. It may also be provided with a hook or a suitable finger. The thread return means may comprise at least one elastic member, so that the weft thread between fabric
5 edge and spool remains under tension.

It is an object of the present invention to provide a method for operating looms for weaving whereby a clean cut fabric is obtained by simple, and inexpensive means and whereby weft thread
10 is saved because with this method no fringes project beyond the fabric which otherwise must be cut away whereby weft thread is wasted.

Further and other objects of the present invention will be hereinafter set forth in the accompanying specification and claims and shown
15 in the drawings which, by way of illustration, show what I now consider to be a preferred embodiment of my invention.

In the drawings:

Figure 1 is a diagrammatic side view of a loom according to the present invention.

Fig. 2 is a top view of the loom shown in Fig. 1.

Fig. 3 is a diagram showing the position of various parts of the loom according to the present invention at a certain operating phase.

Fig. 4 is a diagram showing a phase of operation which follows the phase shown in Fig. 3.

Fig. 5 is a diagram showing a phase of operation which follows the phase shown in Fig. 4.

Fig. 6 is a diagram showing a phase of operation which follows the phase shown in Fig. 5.

Fig. 7 is a diagram showing a phase of operation which follows the phase shown in Fig. 6.

Fig. 8 is a diagram showing a phase of operation which follows the phase shown in Fig. 7.

Fig. 9 is a diagram showing a phase of operation which follows the phase shown in Fig. 8.

Like parts are designated by like numerals in all figures of the drawings. Referring more particularly to Figures 1 and 2 of the drawings; the
40 warp threads 1 run off a warp beam 31. The weft threads 2 and 2' run off stationary spools 3 and 4 respectively which spools are located at the side of the machine. The thread tension is
45 maintained by a thread brake 32. The shuttle 5 is provided with two clamps 6 and 7 and also with one or two notches 8 and 9. With these notches cooperate the hooks 10 and 11 for pulling
50 the shuttle into starting position. The shuttle is also provided, in the known manner, with knives 12 and 13 which cut the weft threads.

Figures 3 to 9 illustrate individual phases of operation of the apparatus according to the present invention. Figures 3 to 9 must be read
55

together with Figures 1 and 2 which latter two figures show constructional details.

The operation is as follows:

In the phase of operation which is diagrammatically illustrated in Figure 3 the shuttle is in its box on the right hand side of the loom which is designated by letter A. Weft thread 2 is brought into the shuttle clamp 6, for example, by moving the thread downwards. Clamp 6 is then closed.

In the phase of operation shown in Figure 4 the shuttle is already started by the shuttle picking mechanism 18 which is not shown in detail as it may be of any conventional construction. The shuttle pulls the thread 2 which is cut by the knife 12 over which the thread which is held in the fabric is layed by the moving shuttle.

In the phase of operation shown in Figure 5 the shuttle 5 has arrived at the other side of the loom which is designated by the letter B and its movement retarded by a brake comprising the brake member 19 which is pressed to the shuttle by the spring 20.

As illustrated in Fig. 6 the shuttle is then brought into a suitable position by means of the hook 11. Hook 11 is connected to one end of and operated by the two arm lever 21 the other end of which is guided in a suitable groove 22 which is connected with the drive shaft 23. Feeler 16 gently presses the weft thread against the end of the raddle 17 in order to prevent recoiling of the thread into the shed. Then the thread clamp 6 is opened, for example, by insertion of a finger 24 which is movably connected to one end of two arm lever 25; the other end of said lever carries a roller 26 which cooperates with the cam disk 27 which is connected with and rotated by shaft 23.

The released end of the weft thread is pulled towards the edge 28 of the fabric by means of the eye 14 of the thread return mechanism. Eye 14 constitutes one end of two-arm lever 29 the other end of which cooperates with and is moved by a cam 30 which is connected to shaft 23. The result of this operation is diagrammatically shown in Fig. 7. Lever 29 may be made of elastic material in order to maintain tension on the thread.

Since the shuttle is always brought into the same position with respect to the fabric edge by means of the hook 10 or 11 before the thread clamp 6 or 7 is opened, the thread return mechanism must pull the thread back always for the same distance. It is obvious that this operation could also be effected by making the stroke of the eye 14 adjustable.

In the operating phase shown in Fig. 8 the last inserted weft thread is beaten up by the raddle 15 against the fabric.

Figure 9 shows the moment when the weft thread 2' is inserted into the clamp 7 as was the case with thread 2 and clamp 6 in the operating phase illustrated in Fig. 3. The operation now takes place from left to right in the same manner as the operation taking place from right to left and illustrated in Figures 3 to 8.

While I believe the above described embodiments of my invention to be preferred embodiments, I wish it to be understood that I do not desire to be limited to the exact details of method, design and construction shown and described, for obvious modifications will occur to a person skilled in the art.

I claim:

1. The method for operating looms for weaving having a gripper shuttle and a stationary spool

for the weft thread comprising the step of moving the shuttle to a predetermined position after it has arrived and is stopped in the shuttle box and before releasing the weft thread from the shuttle, thereafter releasing the weft thread from the shuttle, and pulling the thread backwards until the free end of the thread is adjacent to the fabric edge.

2. The method for operating looms for weaving having gripper shuttles and stationary spools for the weft threads comprising moving the shuttle to a predetermined position after it has arrived and is stopped in the shuttle box and before releasing the weft thread from the shuttle, thereafter releasing the weft thread from the shuttle, holding the free end of the weft thread to prevent recoiling, and pulling the thread backwards until the free end of the thread is adjacent to the fabric edge.

3. A loom for weaving comprising in combination a gripper shuttle, a weft thread connected with said shuttle, weft thread releasing means for releasing said thread from said shuttle, a shuttle receiving brake, a shuttle moving means adapted to be temporarily connected with said shuttle and to move said shuttle and said weft thread connected therewith to a predetermined position after said shuttle is received and stopped by said shuttle receiving brake, and a weft thread return means adapted to engage said weft thread at the side of the loom from which the shuttle is picked into the shed and to pull said weft thread back to a predetermined position after it is released from the shuttle.

4. A loom for weaving comprising in combination a gripper shuttle, a weft thread connected with said shuttle, weft thread releasing means for releasing said thread from said shuttle, a shuttle receiving brake, a shuttle moving means adapted to be temporarily connected with said shuttle and to move said shuttle and said weft thread connected therewith to a predetermined position after said shuttle is received and stopped by said shuttle receiving brake, a thread gripper connected with said shuttle for holding the end of said weft thread, and a stationary thread holding means for holding said weft thread and preventing recoiling thereof after it is released from said shuttle.

5. A loom for weaving comprising in combination a gripper shuttle, a weft thread connected with said shuttle, weft thread releasing means for releasing said thread from said shuttle, a shuttle receiving brake, a shuttle moving means adapted to be temporarily connected with said shuttle and to move said shuttle and said weft thread connected therewith to a predetermined position after said shuttle is received and stopped by said shuttle receiving brake, a thread gripper connected with said shuttle for holding the end of said weft thread, a stationary weft thread holding means for holding said weft thread and preventing recoiling thereof after it is released from said shuttle and a weft thread return means adapted to engage said weft thread and to pull said weft thread back to a predetermined position.

6. A loom for weaving comprising in combination a gripper shuttle, a weft thread connected with said shuttle, weft thread releasing means for releasing said thread from said shuttle, a shuttle receiving brake, a shuttle moving means adapted to be temporarily connected with said shuttle and to move said shuttle and said weft thread connected therewith to a predetermined

position after said shuttle is received and stopped by said shuttle receiving brake, a thread gripper connected with said shuttle for holding the end of said weft thread, a stationary weft thread holding means for holding said weft thread and preventing recoiling thereof after it is released from said shuttle and a weft thread return means adapted to engage said weft thread and to pull said weft thread back to a predetermined position, said holding means being operatively connected with and controlling the operation of said weft thread return means.

7. A loom for weaving comprising in combination a gripper shuttle, a weft thread connected with said shuttle, weft thread releasing means for releasing said thread from said shuttle, a shuttle receiving brake, a shuttle moving means adapted to be temporarily connected with said shuttle and to move said shuttle and said weft thread connected therewith to a predetermined position after said shuttle is received and stopped by said shuttle receiving brake, and a weft thread return means comprising a finger member adapted to engage said weft thread and to pull said weft thread back to a predetermined position after it is released from the shuttle.

8. A loom for weaving comprising in combination a gripper shuttle, a weft thread connected with said shuttle, weft thread releasing means for releasing said thread from said shuttle, a shuttle receiving brake, a shuttle moving means adapted to be temporarily connected with said shuttle and to move said shuttle and said weft thread connected therewith to a predetermined position after said shuttle is received and stopped by said shuttle receiving brake, and a weft thread return means comprising an elastic member adapted to engage said weft thread, to maintain constant tension on said weft thread and to pull said weft thread back to a predetermined position after it is released from the shuttle.

9. A loom for weaving comprising in combination a gripper shuttle, a weft thread connected with said shuttle, weft thread releasing means for releasing said thread from said shuttle, a shuttle receiving brake, a shuttle moving means adapted to be temporarily connected with said shuttle and to move said shuttle and said weft thread connected therewith in the direction of its inlet movement to a predetermined position after said shuttle is received and stopped by said shuttle receiving brake, a thread gripper connected with said shuttle for holding the end of said weft thread, a stationary weft thread holding means for holding said weft thread and preventing recoiling thereof after it is released from said shuttle and a weft thread return means adapted to engage said weft thread and to pull said weft thread back to a predetermined position.

10. A loom for weaving comprising in combination a gripper shuttle, a weft thread connected with said shuttle, weft thread releasing means for releasing said thread from said shuttle, a shuttle receiving brake, a shuttle moving means adapted to be temporarily connected with said shuttle and to move said shuttle and said weft thread connected therewith in the direction of its inlet movement to the new starting position

after said shuttle is received and stopped by said shuttle receiving brake, a thread gripper connected with said shuttle for holding the end of said weft thread, a stationary weft thread holding means for holding said weft thread and preventing recoiling thereof after it is released from said shuttle and a weft thread return means adapted to engage said weft thread and to pull said weft thread back to a predetermined position.

11. A loom for weaving comprising in combination a gripper shuttle, a weft thread connected with said shuttle, weft thread releasing means for releasing said thread from said shuttle, a thread gripper connected with said shuttle for holding the end of said weft thread, a shuttle receiving brake, a shuttle moving means adapted to be temporarily connected with said shuttle and to move said shuttle and said weft thread connected therewith in a direction opposite to its inlet movement to a predetermined position after said shuttle is received and stopped by said shuttle receiving brake, a weft thread tensioning means for maintaining tension of the weft thread in the shed, a stationary weft thread holding means for holding said weft thread and preventing recoiling thereof after it is released from said shuttle and a weft thread return means adapted to engage said weft thread and to pull said weft thread to a predetermined position.

12. A loom for weaving comprising in combination a gripper shuttle, a weft thread connected with said shuttle, weft thread releasing means for releasing said thread from said shuttle, a thread gripper connected with said shuttle for holding the end of said weft thread, a shuttle receiving brake, a shuttle moving means adapted to be temporarily connected with said shuttle and to move said shuttle and said weft thread connected therewith in a direction opposite to the direction of the pick to a predetermined position after said shuttle is received and stopped by said shuttle receiving brake, a weft thread tensioning means for maintaining tension of the weft thread in the shed, a stationary weft thread holding means for holding said weft thread and preventing recoiling thereof after it is released from said shuttle, a weft thread return means adapted to engage, pull on, and straighten out said weft thread, and a weft thread braking means for blocking the weft thread while the weft thread return means is in action.

13. A loom for weaving comprising in combination a gripper shuttle, a weft thread connected with said shuttle, weft thread releasing means for releasing said thread from said shuttle, a shuttle receiving brake, a shuttle moving means adapted to be temporarily connected with said shuttle and to move said shuttle and said weft thread connected therewith in the direction in which the shuttle enters the brake to a predetermined position after said shuttle is received and stopped by said shuttle receiving brake, and a weft thread return means adapted to engage said weft thread and to pull said weft thread back to a predetermined position, after it is released from the shuttle.

ERNST HEFTL