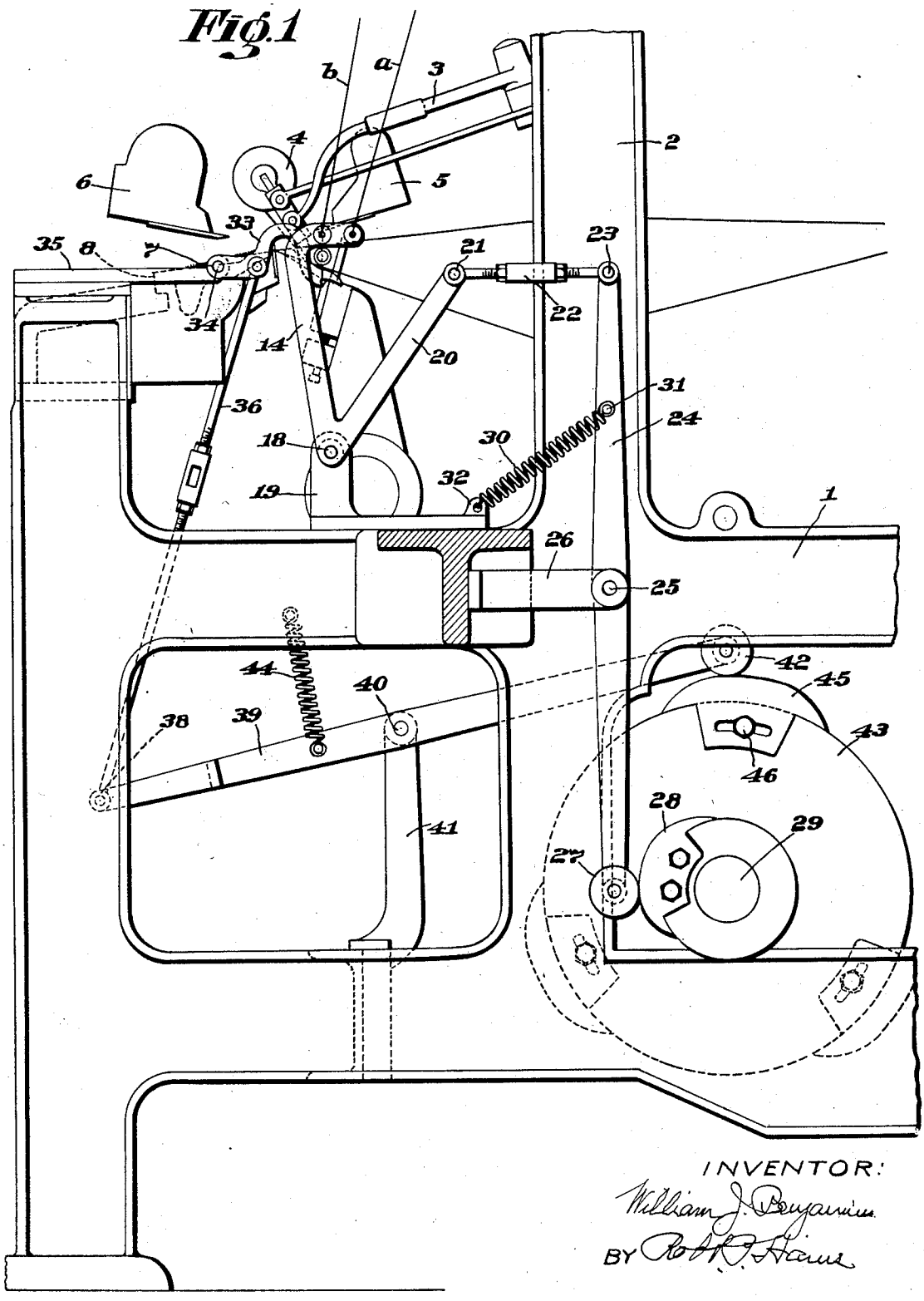
June 26, 1934. W. J. BENJAMIN 1,964,692

SELECTIVE AND SELF THREADING LOOM NEEDLE MECHANISM

Filed July 1, 1933 2 Sheets-Sheet 1

Fig. 1



INVENTOR:
William J. Benjamin
BY Robt. G. Hamm
ATTORNEY

June 26, 1934. W. J. BENJAMIN 1,964,692

SELECTIVE AND SELF THREADING LOOM NEEDLE MECHANISM

Filed July 1, 1933 2 Sheets-Sheet 2

Fig. 2

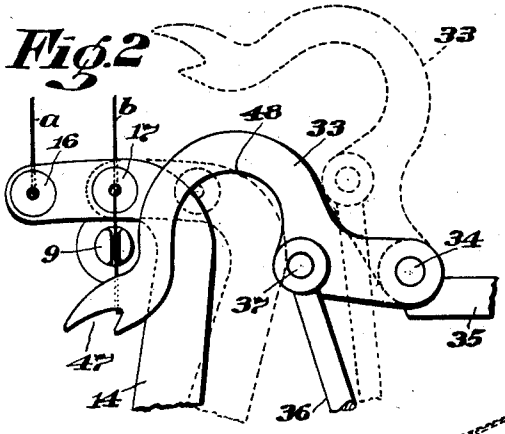
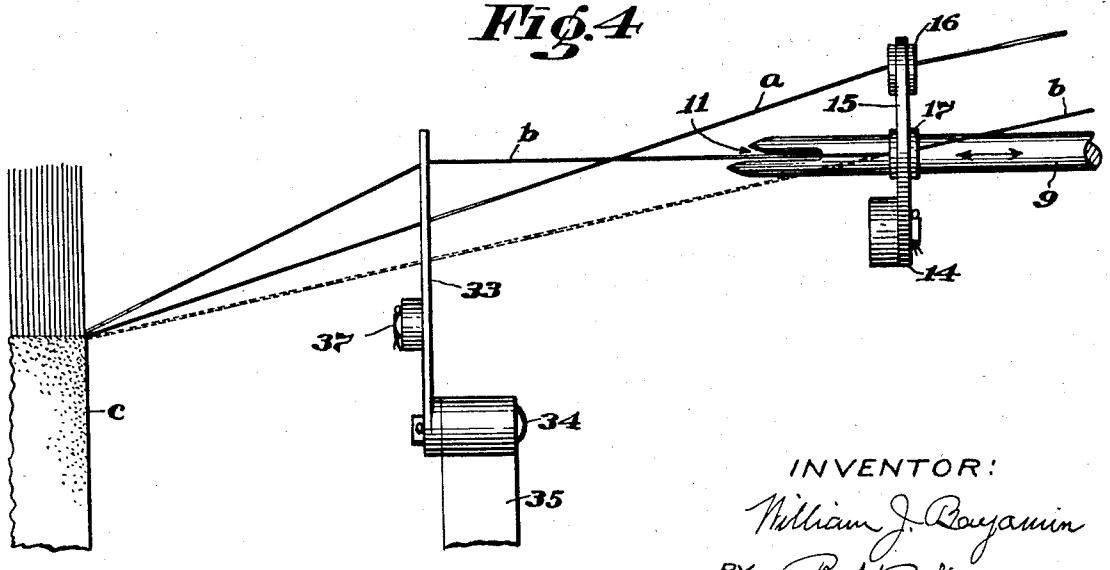


Fig. 3

Fig. 4



INVENTOR:
William J. Benjamin
BY Robt. R. Hains
ATTORNEY

Patented June 26, 1934

1,964,692

UNITED STATES PATENT OFFICE

1,964,692

SELECTIVE AND SELF-THREADING LOOM NEEDLE MECHANISM

William J. Benjamin, Amsterdam, N. Y., assignor to Bigelow-Sanford Carpet Co., Inc., Thompsonville, Conn., a corporation of Massachusetts

Application July 1, 1933, Serial No. 678,652

8 Claims. (Cl. 139—123)

This invention relates to looms and is more particularly concerned with looms of the Axminster type wherein the weft threads are inserted in the shed by the needle.

In looms of this general character a needle is mounted at one side of the loom and is provided with an eye through which the weft thread is passed, so that on each reciprocation of the needle the weft thread is carried through the shed to the opposite side of the loom where it is engaged by a selvage forming device and interlooped with a selvage cord. Fabrics produced by such ordinary Axminster looms are necessarily of limited character, especially in the construction of the backing or ground component, even though the pile surface may be susceptible of pattern variation.

One of the objects of the present invention is to provide an Axminster loom with instrumentalities whereby a greater variety of fabrics are obtainable than has been possible heretofore. Such variations may be manifested in color harmony or contrast between the pile surface and backing or ground fabric, or by differences in the character or weight of the back or ground components with or without color effects.

In accordance with the present invention, the needle is provided with an open or split end and a plurality of weft threads, supplied from an extraneous source, are under control of selective mechanism whereby any one of the plurality of weft threads may be positioned for engagement by the open or split end of the needle on any weft shot and passed through the shed.

More specifically stated the invention comprehends a weft thread selector for carrying any one of the weft threads engaged by it into a primary position relative to the needle, and a weft thread deflector for carrying the positioned weft thread across the path of the needle movement.

The invention and novel features thereof will best be made clear from the following description and accompanying drawings of one good form thereof.

In the drawings:—

Fig. 1 is a sectional side elevation of an Axminster loom provided with the present invention;

Fig. 2 is a detailed side view of the deflector and its association with other parts;

Fig. 3 is a perspective showing the relation of the selector and deflector when a weft thread is positioned to be engaged by the needle and passed through the shed; and

Fig. 4 is a plan view of the parts represented in Fig. 3.

Only so much of the Axminster loom is indicated in Fig. 1 as is necessary to show the association therewith of the features of the present invention. The omitted parts are well understood by those skilled in the art and form no part of the present invention.

Referring to Fig. 1 the loom frame 1 may be of usual construction and rising from the side parts thereof are uprights 2 on which may be supported the tube frame transferrer arms 3. One of the tube frames is indicated in Fig. 1 at 4 and is shown as having been taken by the transferrer arms 3 from the usual chain or carrier of such looms to present the pile forming tuft yarns to the weaving point. The means for operating the tube frame carrier or chains is not indicated as it is a usual and well known feature in looms of this type. Likewise, the loom is provided with the cutter carriers 5 and 6, which at appropriate times serve to cut or part the tuft yarns after they have been delivered to the weaving point.

As the weaving proceeds the fabric 7 produced by the weaving operation is carried over the usual breast plate 8 and delivered to a usual take-up mechanism, not shown.

The weft needle 9, Figs. 3 and 4, is guided in its usual reciprocating movements by a guide 10, Fig. 3, which may be of usual or ordinary construction. The means for imparting reciprocating movements to the needle is not shown since it too may be of any well known character, now well understood in the art.

The needle 9 has a split or open end 11, the slit of which, as shown in the present instance, is in a vertical plane passing longitudinally of the needle.

The weft threads *a* and *b*, Fig. 3, are supplied from an extraneous source and pass through the stationary guides 12 and 13 and from such guides the weft threads lead to the selvage of the cloth *c*, as indicated in Figs. 3 and 4, and are normally out of the path of the needle movement.

In accordance with the present invention any number of weft threads may be conveniently employed but, as shown, two are indicated in the drawings and means are employed for selectively positioning any one of the weft threads, so that on the inserting movement of the needle the positioned weft thread will be engaged by the split end of the needle and carried into the shed.

The weft threads selecting mechanism comprises two members, one of which is adapted to move a desired weft thread into a position above the needle in the plane passing longitudinally thereto, as shown in the present instance; and

the other member is positioned between the first member and the cloth selvage for deflecting a thread positioned by the first member, so that on the inserting movement of the needle the selected weft thread will be passed through the shed.

As hereinbefore stated it is usual in looms of this general type to provide a selvage forming mechanism at the side of the web opposite the needle and such mechanism may take any usual form, such for instance as a selvage shuttle carrying a selvage cord which may be passed through the loop of the inserted weft thread to hold it and form a selvage at that side of the cloth, but since such selvage mechanism may be of usual character and is now well understood in the art it is not herein shown.

The selector 14 has its upper end portion 15 turned rearwardly and as shown such rearwardly extended end is provided with two weft guides 16 and 17, in the present instance, through each one of which a weft thread passes as indicated in Figs. 3 and 4.

The selector 14 is pivotally mounted at 18 on the upstanding arm of a bracket 19 secured to the loom frame. Projecting from the pivotal mounting 18 of the selector is an arm 20 to which is connected at 21 a link 22, shown as of the turn buckle type. The link 22 is connected at 23 to the upper end of a lever 24 pivoted at 25 to a bracket 26 extending from the loom frame, and the lower end of the lever 24 is provided with a roller 27 which is held in engagement with a cam 28 on the cam shaft 29 by a spring 30, one end of which is secured to the lever 24 at 31 and the other end of which is secured to a lug 32 on bracket 19 fixed to the loom frame, the construction being such that as the shaft 29 is rotated the selector 14 will be moved in accordance with the dictates of the cam 28 to move one or the other of the weft threads into a position above the needle and in a plane passing longitudinally therethrough.

The weft thread deflector 33 as more fully indicated in Fig. 3 is constituted as a lever pivotally mounted at 34 on an arm or bracket 35 which may be conveniently secured to the front portion of the loom, Fig. 1.

The deflector 33 is operatively engaged with an actuating rod 36 and, as shown, such rod is pivotally connected to the deflector at 37 and from this point extends downwardly and is connected at 38 to a lever 39 pivotally mounted at 40 on a bracket arm 41 secured to the loom frame. The lever 39 carries a roller 42 which is normally held in rolling contact with the cam disk 43 by a spring 44, Fig. 1.

The cam disk 43 is provided with a series of cams 45 which may be adjustably secured to the disk by the slot and pin connection 46, as shown, the construction being such that as the cam disk 43 is turned, preferably with the shaft 29, the lever 39 will be rocked on its pivotal mounting to thereby actuate the deflector and move it from an upper and a lower position, as indicated by full and dotted lines, Fig. 2.

The deflector 33 is provided with an open hook 47 which, by the actuator means hereinbefore described, is caused to move across the path of the needle 9 and then return to its initial or dotted line position, Fig. 2.

From the construction thus far described it will be apparent that when the selector has been moved to carry one of the plural number of weft threads into the vertical plane above the needle, the thread so positioned will be located above the opening of the split 11 at the end of the needle, and when so positioned the deflector 33 will be actuated to carry the positioned weft thread across the path of the needle, so that on its movement into the shed the open end of the needle will engage the positioned and deflected weft thread and carry it into the shed. As hereinbefore noted the weft threads may vary in size and/or color and any one of the weft threads may be caused to pass through the shed any number of times in accordance with the dictates of the selector operating cam.

The deflector 33 has a goose neck 48 so that when the selector 14 has moved the weft thread *a* into position above the needle and the deflector is actuated to carry the positioned thread across the path of the needle, the goose neck 48 will not interfere with the other weft thread *b*.

As graphically shown in Fig. 4 the dotted line extending from the cloth selvage through the guide of the selector indicates that the thread *b* has been positioned by the transverse movement of the selector into the longitudinal plane passing through the needle. The deflector 33 thereupon engages the thread *b* and moves it across the path of the needle, Figs. 2 and 4 whereby on insertion movement of the needle the thread *b* will be carried into the shed.

From the construction described it will appear that the present invention provides a simple yet effective means for selecting any one of a plural number of weft threads and passing the selected thread through the shed by the engagement with the open end of the needle, and inasmuch as such weft threads may be differently constituted as to size, character and color it follows that the backing or ground fabric may be formed of different weights or size of threads and that the color itself may be chosen by the operator, thus the mechanism is adaptable to weaves or formations of heavy matted backing fabrics or a coarse heavy matted cushion back fabric.

What is claimed is:—

1. In a loom, the combination of a needle having a split end extending longitudinally of the needle for engaging and passing a weft thread through the shed, weft thread selecting mechanism for determining which of a plurality of weft threads shall be engaged and passed through the shed by the needle, comprising a member having a plurality of relatively fixed weft guides mounted thereon, means for moving said member and the weft guides transversely of the needle path to position a weft thread in the line of needle movement and the split end of the needle, a second member for engaging the positioned weft thread, and means for actuating the second member to cause it to carry the positioned weft thread across the line of needle movement.

2. In a loom, the combination of a needle having a split end for engaging and passing a weft thread through the shed, weft thread selecting mechanism for determining which of a plurality of weft threads shall be engaged and passed through the shed by the split end of the needle, comprising a member having a plurality of separated weft guides, means for moving said member transversely of the needle path to position a weft thread in a plane passing longitudinally of the needle and the opening of the split end, a second member having an open hook for engaging the positioned weft thread between the first mentioned member and cloth selvage, and means for

actuating the second member to carry the weft thread across the path of needle movement.

3. In an Axminster loom, the combination of a needle having a split end for passing a weft thread through the shed, a weft thread selector arm having a plurality of weft guides, means for moving the arm to place one of a plurality of weft threads in a plane passing longitudinally of the needle and the opening of the split end, a weft thread deflecting member adapted to engage any weft thread between the cloth selvage and needle when it has been positioned by said arm, and means for actuating the deflecting member to move the positioned weft thread across the path of the needle.

4. In an Axminster loom, the combination of a needle having a split end for passing a weft thread through the shed, a weft thread selector arm having a plurality of weft guides, means for moving the arm to place one of a plurality of weft threads in a plane passing longitudinally of the needle and the opening of the split end, a weft thread deflecting member having an open hooked end and adapted to engage any weft thread between the cloth selvage and needle when it has been positioned by said arm, and means for actuating the deflecting member to move the positioned weft thread across the path of the needle.

5. In a loom, the combination of a needle having a split end for engaging and passing a weft thread through the shed, a weft thread selector having a plurality of weft guides fixed thereon and mounted for movement transversely of the needle when the latter is in substantially its retracted position, a weft thread deflector having an open hooked end between the thread selector and the cloth selvage, and means for causing the deflector to engage and deflect a weft thread between the selector member and cloth selvage that it may be engaged and passed through the shed by the needle.

6. In a loom, the combination of weft needle having a split end, a weft thread selector having a rearwardly extending end provided with a plurality of weft guides, means for moving the selector and weft guides mounted thereon to place one of the weft guides in the vertical plane above the needle and its split end, a weft deflector between the selector and cloth selvage having a gooseneck terminating in an open hook to deflect the selected weft thread downwardly across the path of the needle that it may be engaged by the split end of the needle and be passed through the shed.

7. In a loom, the combination of a weft needle having an open split end, a pivotally mounted weft thread selector having a rearwardly extending end provided with plurality of weft guides, means for swinging the selector and weft guides to place a weft thread in the vertical plane passing longitudinally through the split end of the needle for engagement by the split end of the needle when the weft thread is deflected between the selector and the shed, a weft thread deflector pivotally mounted between the selector and cloth selvage and having an open hook to bend or deflect the selected weft thread across the path of needle movement, and means for actuating the deflector.

8. In a loom, the combination of a weft needle having an open split end, a pivotally mounted weft thread selector having a rearwardly extending free end portion provided with a plurality of weft guides, means for swinging the selector to place a weft thread in position for engagement by the split end of the needle when the weft thread is deflected between the selector and the shed, a weft thread deflector pivotally mounted between the selector and cloth selvage and having an open hook to bend or deflect the selected weft thread across the path of needle movement, and means for actuating the deflector.

WILLIAM J. BENJAMIN.