

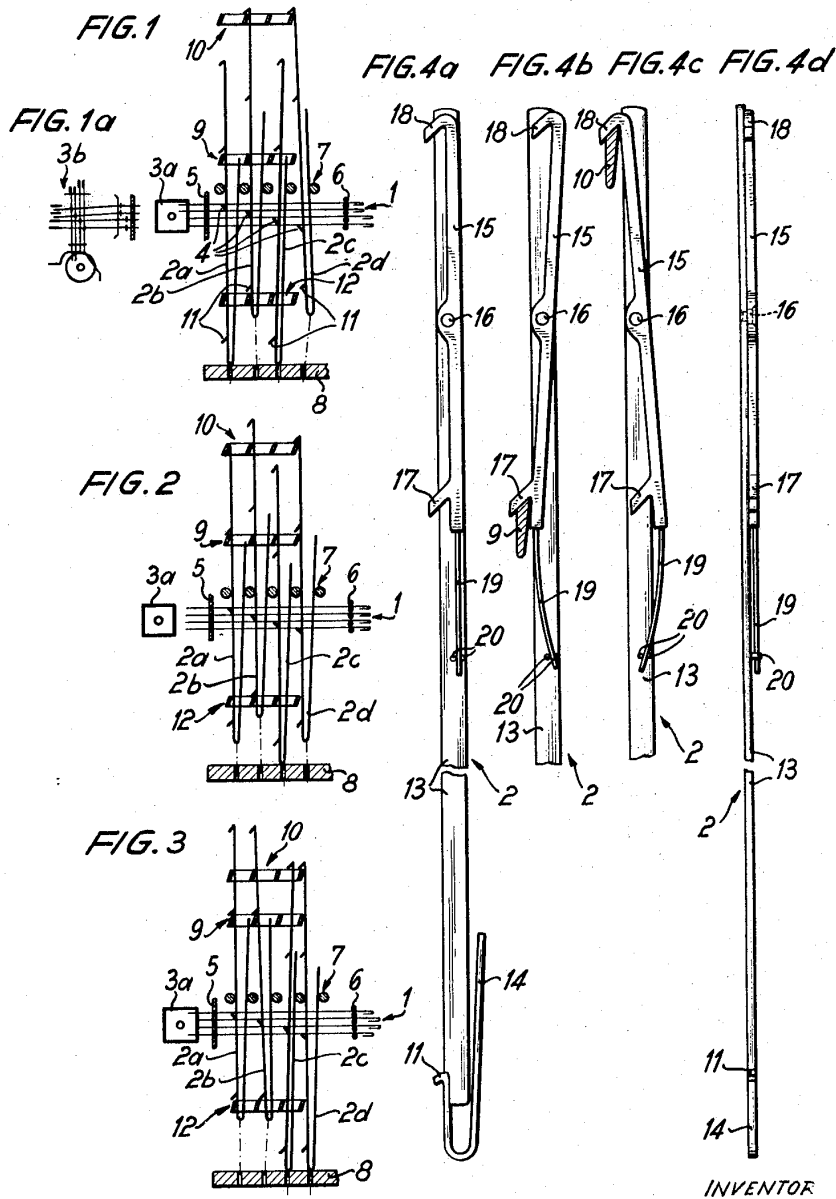
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DOUBLE-LIFT, OPEN-SHED JACQUARD LOOM

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**DOUBLE-LIFT, OPEN-SHED JACQUARD LOOM**  
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3 Claims

### ABSTRACT OF THE DISCLOSURE

The invention concerns a Jacquard loom of the double-lift, open-shed kind with lifter hooks controlled by so-called "main needles." One object of the invention is to arrange for the sets of griffes to be movable in opposite directions but in such a way that their paths do not cross; thus the structural length of the loom can be reduced. The invention also has the object of reducing the time during which the hooks have to be deflected by the "main needles" so that wear on the main needles and hooks caused by frictional contact therebetween can be reduced.

The invention relates to a double-lift, open-shed Jacquard loom.

Already known in the art are Jacquard looms which incorporate two series-arranged sets of griffes which move in opposite directions so that their paths cross each other, and in which the lifter hooks have two shanks and are controlled by the main needles. It is also known to provide a set of stationary griffes on which the lifter hooks are supported when they are to stay in the upper shed.

These known looms are of considerable length owing to the fact that the griffe boxes must have sufficient room to pass each other. When the vertically moving sets of griffes—which are equipped with two shanks or stems and are arranged to pass from the upper shed to the lower shed—pass each other, the nose or lug of the free shank (stem) of the hook must be deflected away from the upwardly-moving griffe. This mode of procedure is necessary to prevent the hook from being raised again by the other set of griffes. The deflection of the hook has to be maintained until the vertically moving sets of griffes have crossed each other. The deflection of the hook must in fact last for a time corresponding to half a shedding motion (stroke), i.e., to about 180° of a single rotation of the crankshaft.

It will be readily appreciated that the long period of time during which the hook is deflected leads to a relatively high degree of friction between the main needle and the hook, so that the condition of the hooks, and of the main needles which deflect them, is adversely affected.

This invention has the object of providing a Jacquard loom whose structural length is considerably reduced and in which the hooks do not have to be thrust away or deflected for so long a time.

This object is achieved by arranging for the sets of griffes to move in opposite directions relative to one another without their paths crossing, and by the provision that each hook has two mutually spaced hook noses or lugs one of which co-operates with the upper set of griffes and the other with the lower set of griffes. Furthermore, the hook noses (lugs) are located on the two ends of a double-armed lever which is pivotably attached to one of the shanks or stems of the hook and can be so pivoted—as a result of engagement therewith by the griffe and against the bias of a restoring force—that the other nose (lug) is shifted to a position outside the area of influence of the second set of griffes.

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A particularly favourable form of construction consists in embodying the shank of the hook which carries the two-armed lever as a flat rod or bar.

The above-mentioned restoring force is realised, according to a further feature of the invention, by means of a bar spring which is attached to one end of the lever so as to form an extension thereof and whose free end is deflectably arranged on the shank of the hook. This feature of the present invention enables the lever to be pivoted, in a simple manner and as a result of engagement therewith by the two sets of griffes, without any possibility of complications occurring.

The invention will now be described with reference to the accompanying drawings, which show a preferred embodiment of the invention but in no restrictive sense.

FIGURES 1–3 show diagrammatically the Jacquard loom according to the invention in different control positions.

FIGURES 4a–4d present views from the front and side of the hook according to the invention, showing different working positions thereof.

FIGURES 1–3 illustrate the positions of the loom for controlling shedding. For the sake of simplicity only four main needles 1 and four lifter hooks 2a–2d are shown.

In a known manner the main needles 1 are mounted in a needle board 5 and in a needle grid 6 and are controlled by a card (Jacquard) cylinder 3a or by a preliminary needle mechanism 3b. The thrusting motions of the main needles 1 are transmitted, via the angled projections or shoulders 4 on the needles 1, to the hooks 2. The hooks 2 are guided in guide grid 7 and are supported in their rest position on a stationary bottom board 8.

The invention provides, above the guide grid 7, two mutually superposed sets of griffes 9, 10 which move in opposite directions and serve to move with them, into the upper shed position, those hooks 2 which have not been deflected by the main needles 1. A further control movement causes the hooks 2 to be moved back into the lower shed position by the sets of griffes 9, 10 or, through the agency of nose (lug) 11 which is known per se, to be supported in the upper shed position on a set of stop (check) griffes arranged below the main needles 1.

The detailed control procedure of the Jacquard loom is as follows:

As shown in FIGURE 1, which illustrates the positions of the set of griffes 10 controlling the upper shed position (the sets of griffes 9, 10 are in their uppermost and lowermost positions respectively), hook 2a is in its inoperative position and rests on the bottom board 8. This hook 2a is not deflected by the associated main needle 1 or by its angled projection or shoulder 4.

Hook 2b also is not deflected by its associated main needle 1, but is in the upper shed position.

Hook 2c is in its inoperative position and is deflected by its associated main needle, whereas hook 2d is in the upper shed position and is in its deflected position.

As shown in FIGURE 2, which illustrates the control position (the two sets of griffes have moved a certain distance towards each other), the following alteration has taken place: Hook 2a is moved by the set of griffes 9 into the upper shed position, as it has not been deflected or thrust away by its associated main needle. Hook 2b, on the other hand, remains in the upper shed position—in spite of the fact that the set of griffes 10 has been lowered—because it also has not been deflected and as a result is supported by the set of stop (check) griffes 12 through the agency of nose or lug 11.

Hook 2c remains in its inoperative position, as it has been deflected by its associated main needle 1, whereas hook 2d is lowered into the lower shed position as, in

consequence of its deflection, it cannot be retained by its nose (lug) 11, on the set of stop (check) griffes 12.

As shown in FIGURE 3, which illustrates the open-shed control position of the lower set of griffes 9 (the lower set of griffes 9 is in its uppermost position and the upper set of griffes 10 is in its lowermost position), hooks 2a and 2b are in the upper shed position, hook 2b being deflected. When the set of griffes 9 is lowered into the position shown in FIGURE 1, hook 2b is lowered, while hook 2a remains in the upper shed position owing to the fact that its nose (lug) 11 is supported by the set of stop (check) griffes 12.

Hooks 2c and 2d are in their inoperative position, although hook 2c has been deflected, while hook 2d has not been deflected. Accordingly, hook 2c will remain in its inoperative position during the next working stroke, whereas the set of griffes 10 will carry hook 2d with it into the upper shed position.

The manner of construction of the hooks is apparent from FIGURES 4a-4d. In these figures each hook 2 has a shank 13 constructed as a flat rod or bar and a springy shank 14 whose bent-over end is welded to the shank 13 and forms the nose (lug) 11.

According to the invention a two-armed lever 15 is pivotably mounted on shank 13 through the intermediary of a pivot pin 16. The lever is formed with a nose (lug) at each of its ends; the lower nose is designated as 17 and the upper nose as 18. In the undeflected condition shown in FIGURE 4a, both noses extend a short distance beyond the front edge of the shank 13 of the hook. The two-armed lever 15 is also subject to the action of a restoring force which is in the embodiment shown is constituted by a bar spring 19. This bar spring is located at one end of lever 15 so as to constitute an extension thereof and is also supported between two stops 20 fixed to the shank 13 of the hook.

The two-armed lever can be laterally deflected, against the bias of this spring 19, by engagement of the griffes 9 under noses 17 or of griffes under noses 18. As can be seen from FIGURES 4b and 4c, the nose which is not thus engaged will be pivoted so that it will move to a point beyond the front edge of the hook shank 13, so that it will be unaligned with the path of movement of

the other set of griffes. In the position illustrated in FIGURE 4b the hook shank 13 can be guided unobstructed past the set of griffes 10 and past the set of griffes 9 in the position shown in FIGURE 4c.

I claim:

1. Double-lift, open-shed Jacquard loom with hooks controlled by the main needles, two sets of griffes movable in opposite directions, and a stationary set of griffes, wherein the sets of griffes move in opposite directions without their paths of movement crossing one another, each hook is equipped with two mutually distanced hook noses, said hooks cooperating with said two sets of griffes, the hook noses are located on the two ends of a two-armed lever which is pivotably fixed to a shank of the hook and is so pivotable, against the bias of a restoring force and owing to the engagement of a griffe with one of said hook noses from the undeflected position that the other hook nose is moved to a position lying beyond the path of movement of the other set of griffes.

2. Double-lift, open-shed Jacquard loom, as claimed in claim 1, wherein the hook shank equipped with the two-armed lever is constructed as a flat bar.

3. Double-lift, open-shed, Jacquard loom as claimed in claim 2, wherein at least one bar spring serves as the restoring force and is fixed to one end of the lever so as to constitute an extension thereof, while its free end is deflectably attached to the associated shank of the hook.

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