3.5 Double-lift Double-cylinder Jacquard

In a double-lift double-cylinder Jacquard system, vibration of parts is very much reduced as two cylinders are working alternately and their speeds are reduced to half the crankshaft speed.

The two cylinders work at opposite ends with individual sets of cards. The cards used for the bottom cylinder are for the odd picks, while those for the top cylinder are for the even picks. As the cylinders strike alternately to present the card with reduced speed, the selection of hooks is achieved accurately and damage to the cards is considerably reduced. The drag on the pattern card is also reduced, especially when large sets of harnesses are necessary, so the working of the machine is smooth. The loom too can be run at a relatively higher speed.

Principle

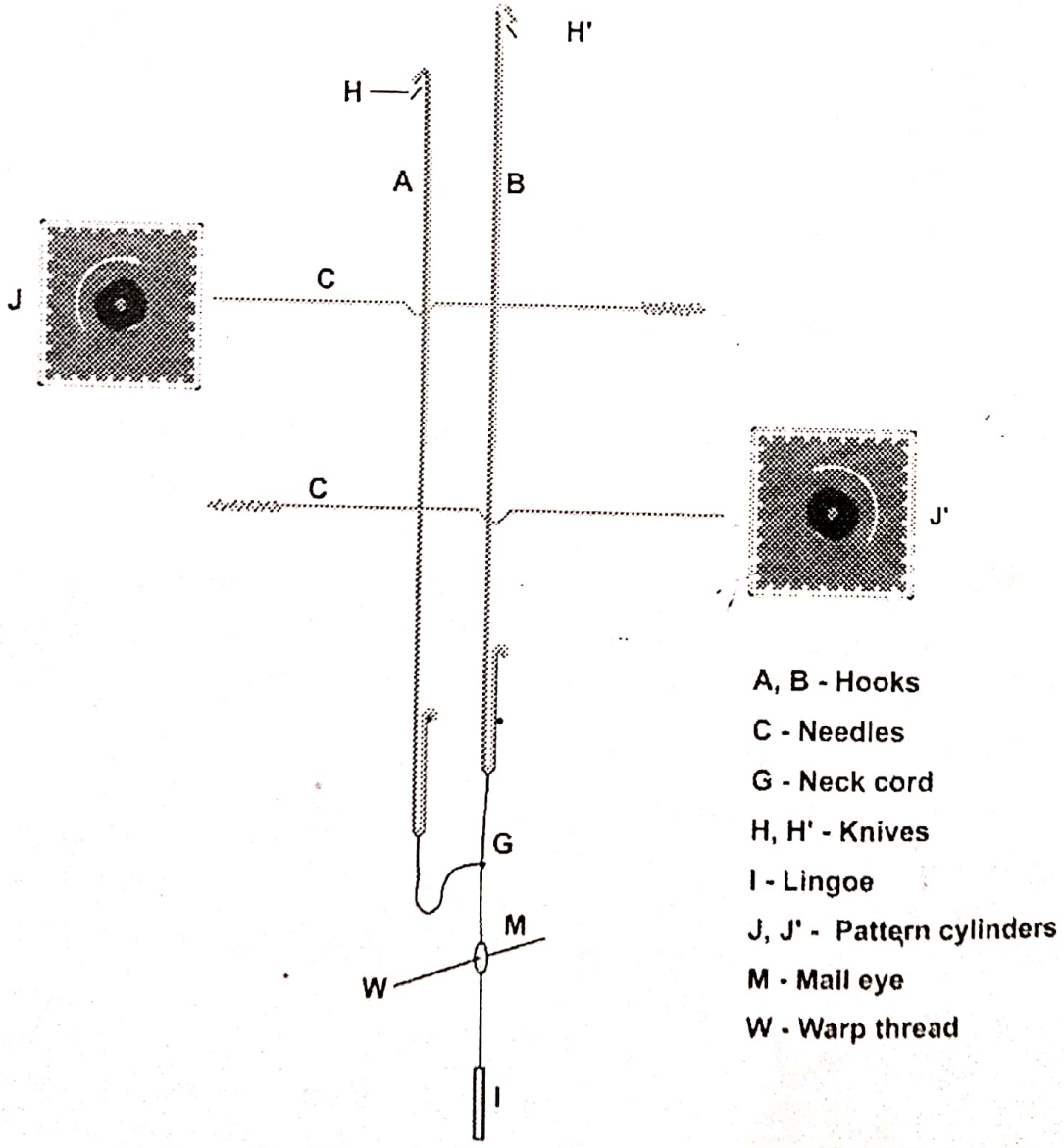


Figure 3.6 Principle of Double-lift Double-cylinder Jacquard

The principle of a double-lift double-cylinder Jacquard is shown in the Figure 3.6. One knife H' is at the top and the other knife H is down. The warp thread passing through the mail eye of the harness cord connected to the hook B is lifted. Suppose it is required to lift the same ends for the next pick, a card cylinder J is pressed against the needle C and if there is a hole in the card opposite to the needle C, hook A will be left over the knife H. Thus when the knife H is lifted, the hook A will also be taken up. As the hooks A and B cross at the middle of their stroke the weight of the warp threads and the lingoes on the neck cord C will at that moment pass from the hook B to A. The bottom cylinder controls the odd numbered picks and the top cylinder the even numbered picks.

Construction and working

The left side view of a double-lift double-cylinder Jacquard is shown in Figure 3.7. The arrangement of one complete row of both sets of hooks, needles and the cross-sections of the two cylinders is shown clearly.

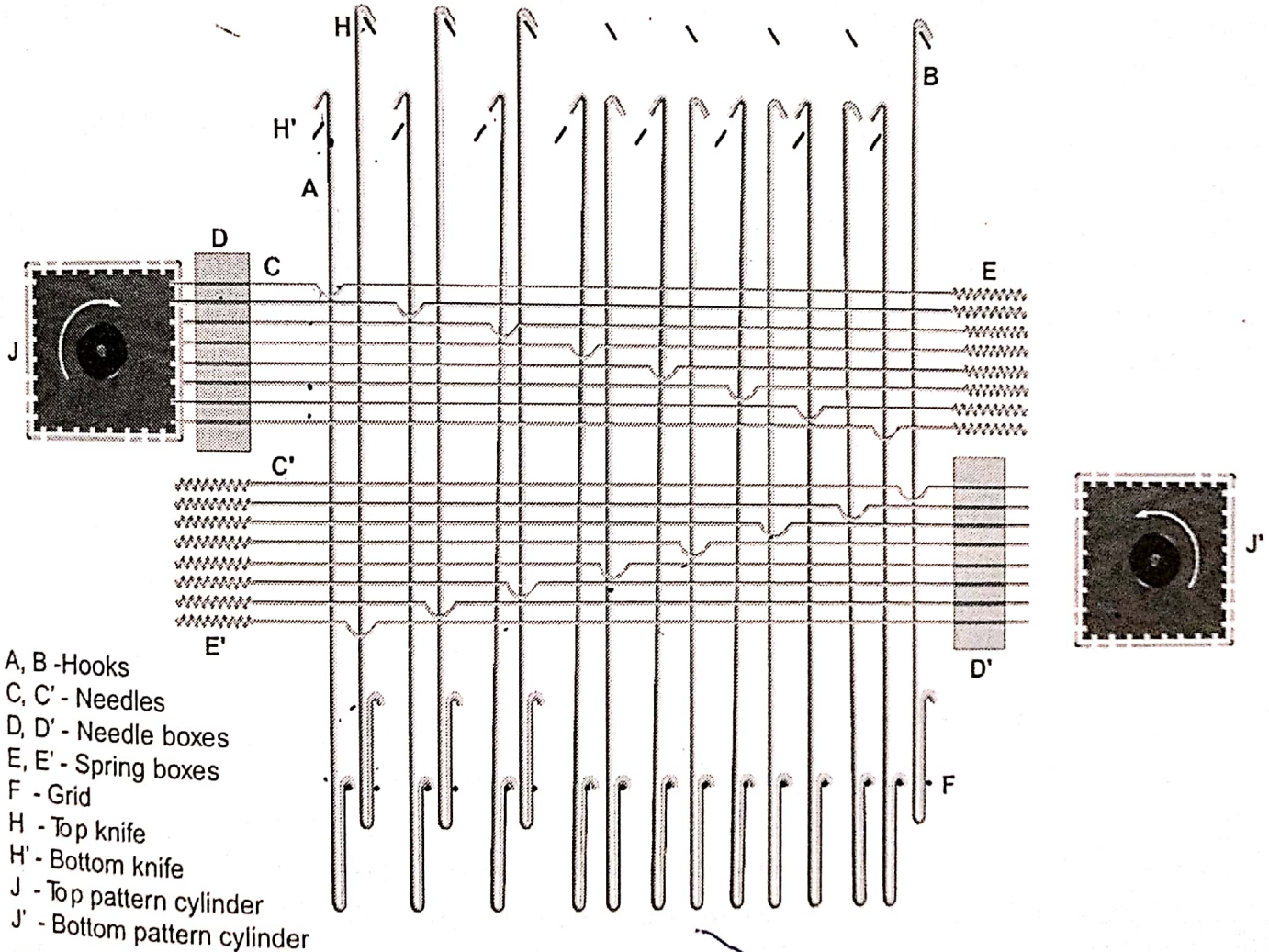


Figure 3.7 Double-lift Double-cylinder Jacquard In the CD-ROM, watch Animation No. WFP - II 3.2

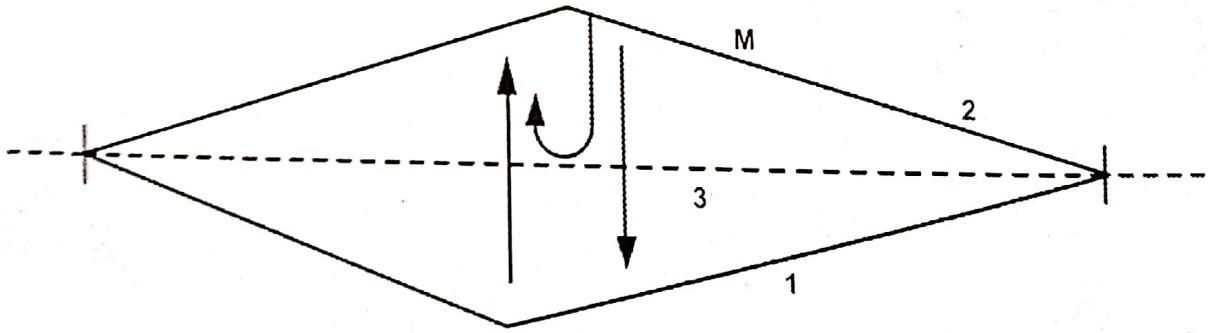
A and B are the hooks facing their respective cylinders. C is the upper set of needles and C′ the lower set. D and D′ are the needle boards, and E and E′ are the spring

boxes. The set of knives controlling the top set of needles is shown as H and those controlling the bottom set as H′. The top cylinder J operates the hooks A that relate to the even-numbered picks. Likewise, the bottom cylinder J′ operates the hooks B that are intended for the odd-numbered picks. Two adjacent hooks, one controlled by the bottom cylinder and the other by the top cylinder, are connected together by a neck cord. Each neck cord controls one warp thread in a repeat, by means of a harness. Therefore, for creating many repeats across the fabric, many harnesses are connected to each neck cord.

The working principle of a double-lift double-cylinder Jacquard can be understood by first noting the following points.

The bottom knife H′ is at the bottom and the top knife H is at the topmost level. The bottom cylinder J′ is at its innermost position [pressing the bottom needles] and the top cylinder J is at its outermost position. Punched cards are arranged on both the cylinders for selecting the required needles. The needles in line with the holes in the punched card pass through them, whereas the needles in line with the blanks are pushed away from the cylinder.

Keeping the above information in mind, it can be understood that, when the bottom cylinder is pressed against the needles, those (needles) that are in line with the holes in the card will be selected. As a result the hooks that are connected to the selected needles will engage with the bottom knife. When the bottom knife moves up, it lifts the hooks engaged with it, and thereby, the warp threads connected to these hooks will be raised.



1 - Stationary bottom line of warp

2 - Top line of warp

3 - Line where downward movement ceases

Figure 3.8 Semi-open shed

Similarly, the next shed is produced by means of the top set of cylinder, needles, hooks and knife. The double-lift double-cylinder Jacquard produces a semi-open shed.

The warp thread M connected to neck cord N is raised by a top hook. If it is required to lift the same warp thread in the next shed too, the bottom hook of the same neck

cord has to be raised. In this case, the top hook will come down and the bottom hook will go up. Both will meet at the centre.

Due to the above action, the warp thread M will come down to the centre of the shed and will then move up again, thus producing a semi-open shed, as shown in the Figure 3.8.