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Improvements in Jacquards.

The Modern Jacquard is so slightly different from the original machine as designed by its inventor, that it is with interest that the introduction of any new feature or types is received. Many changes and alterations have been made, patented and tested, but this lat-

tered from lathes *C* and *D*, and swing in their guides against the needleboards *E* and *F* (Fig. 2). The hooks *G* are provided with double catch hooks made of flexible metal. Each hook governs two needles which work in different directions — that is, one needle works against the left cylinder, while the other works against the right. Above the needles is a



J. M. JACQUARD

BORN AT LYON, FRANCE. JULY 7th, 1752
DIED AUGUST 7th, 1834

ter process has been the last point many have reached; and although an immense number of alterations have been tried, only a very small number have proved worthy of regular use. The jacquard, however, is not yet perfect, and time only can show the value of suggestive improvements which have recently been made.

The first of these, was a double machine used for weaving alternative designs, invented by H. Schroers, of Crefeld, Germany, who arranged two cylinders for the jacquard, one carrying the groundwork design and the other the border pattern. The patterns are changed by means of a chain of metal lags working in connection with an extra hook in the jacquard.

The cylinders *A* and *B* (Figs. 1 and 2) are sus-

rack *H*, which is the main feature of the improved machine, and which can be moved in a lateral direction as desired. This rack is the means by which the right or left-hand catches of the hooks are brought into contact with the knives *J*. The adjustment of the rack *H* also actuates the lever *K*, which is pivoted on the pin *L*, and brings the lever catch *M* or *N* into contact with the nose piece on either lathe *C* or *D*.

In Fig. 2 the rack is shown in the right-hand position; the lever catch *N* is in contact with the cylinder lathe, and when the cylinder *A* makes a forward movement, the lever *K* is turned towards the left, carrying with it the rack *H*, which only allows the left-hand catches of the hooks to be acted upon by the

knives *J*. Further, the catch *M* of the lever *K* falls on to the projection *O* of the needleboard *F*, and owing

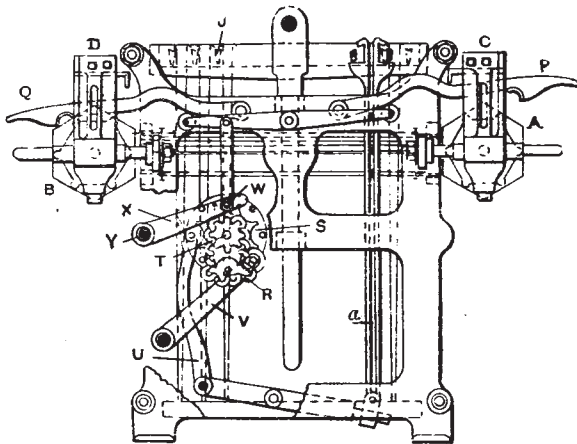


Fig. 1

to the pull exerted towards the right by the elasticity of the hooks, is firmly held there. This causes the needles on one side to project from the needleplate, while those on the opposite side disappear within the perforations of the plate.

In such a manner the machine may be kept working with one set of pattern cards as long as required, the other set remaining at rest owing to the lever *H* releasing the catch hooks *P* or *Q*, as the case may be.

The lever *H* is controlled by the lags *R* (Fig. 1), which pass over the barrel *T*. In addition to the pegs *S* for operating the pawl *U*, semi-circular recesses are formed in which the bowls of the locking lever *V* rest. The tappet chain acts upon the bowl *W* of the lever *X*, which is mounted on the shaft *Y*, the spring rod *Z* (Fig. 2) compensating for any over-pressure. When either of the pattern cards sets the

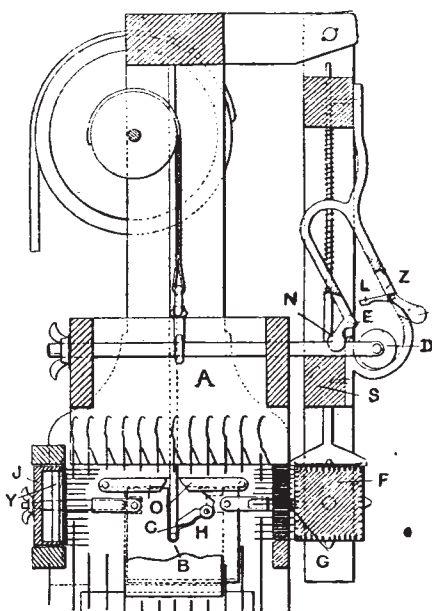


Fig. 3

reserve hooks *a* in motion, in whichever direction it may be, the lags *R* are moved one tooth, and act

accordingly upon the contact rod *Z*. Vertical needle grids are mounted in the rear of the needleplate, but spring cases are not required.

The other jacquard, see Fig. 3, which refers to French invention by Mr. *L. A. Garchey*, of *Paris*. It works without a needle case or spring needle guides. It has additional parts which impart different movements to the cylinder, needleplate, etc., in a very exact manner, in order to protect the cards. It is also fitted with a contact appliance which makes it possible to easily put any number of rows of needles out of gear without exposing the rest of the wires to any risk of injury.

The cylinder *F* (Fig. 3) hangs from its lathe *S* in the usual manner, and motion is imparted by means of the bowl *D* working in the cam-shaped slot *K*. This movement is similar to the principle used in other jacquards; but in addition to the usual swinging motion imparted to the lathe, the bowl *D* comes in contact with the finger *N*, which is mounted on *K*, pressing it back into the recess *Z* as it passes. This finger *L* has attached a weighted end *M* which is

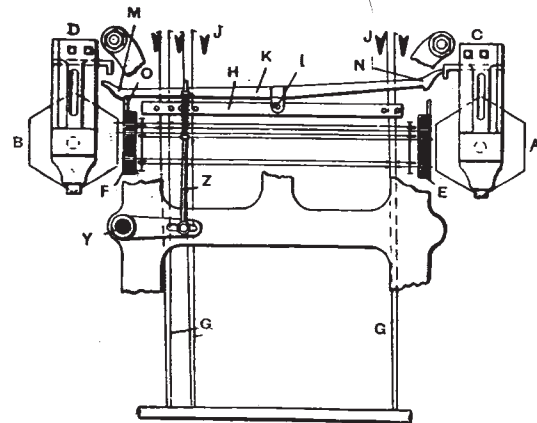


Fig. 2

arranged so that *L* can be lifted without affecting or moving *M*, but so that on the downward movement of the bowl *D* a contact ensues between *L* and *M* at their point of junction, whereby the weight *M* causes *L* to return to its original position. When the bowl *D* commences to move downwards, the tongue *L* drops down out of the recess *Z*, and presents a certain resistance to its passage, the result of which throws the lathe suddenly and slightly towards the right, see Fig. 3.

The needles of the machine are pointed at both ends, the left ends passing first through a perforated plate, and then in to the horizontally movable grid or striker *J*, which consists of a frame carrying so many iron rods *Y* as there are rows of needles in the machine. The lower ends of these rods *Y* are bolts of circular cross section, but the remainder is of square section. They can easily be removed from the frame *J* by pushing up their lower ends with a pointed tool and drawing them out at the top.

The grid or striker *J* is bolted by long rods to the sliding piece *H*, which moves horizontally backwards and forwards in guides *O*. On the front side of the slide are the bolts *G*, against which the card cylinder rests. A finger *C* is attached to the plate *H*, in which is a slot wherein the bowl *B* moves, and this is attached to a rod which moves vertically with the knife box. The bowl *B* and the finger *C* are always in contact.

As the upward movement commences, the bowl *D* comes in contact with the abutment *E*, which throws the cylinder slightly towards the left of the illustration. The cylinder acts on the bolt *G*, which in its turn moves the slide *H* and also the grid *J* to the left.

In this manner all the needles to the left are released, and at the same time the finger *C*, which partly follows the upward movement of the bowl *B*, is moved into a position ready for action when *B* descends again.

The card cylinder *F* completely controls the needles and sets them in accordance with the pattern, and at the same time the knife box ascends. The bowl *D* then passes the finger *L* and moves the lathe *S* outward far enough to allow the cylinder to turn. On the return journey, the bowl *D* drives the finger *L* against the curve of the guide *K*, and thereby meets with a resistance which causes the heavy end *N* of the lever *E* to be tipped upwards, causing the cylinder to move slightly outwards. At the same moment the bowl *B* makes contact with the finger *C*, and the whole apparatus, comprising *J*, *H*, and *G*, returns to its right-hand position.

Practical Points on Narrow Ware Looms.

Of the narrow ware looms in use to-day, none are doing a greater variety of weaving, so far as stock, design, and fabric structures are concerned, than the narrow ware looms as are built by the well known **Fletcher Works**, (formerly **SCHAUM & UHLINGER**, Philadelphia.

Their narrow ware weaving machinery includes looms of all types, for producing narrow ware goods, of all descriptions, from the coarsest sisal twine used for both warp and filling to the finest silk.

In every instance it will be found the object of the builder has been to construct as simple a machine as the class of goods for which it is designed will permit.

To illustrate: Their looms for weaving webbing such as is used for girths, halters or head stalls and flat and tubular fabrics of that class, are machines so simple and substantially built that when once rightly set up they will almost take care of themselves. This is accounted for more readily because *every motion of the loom is positive.*

The shuttles are operated by a rack and pinion gear drive common to all their tape and narrow ware looms.

The shedding device consists of side cams and their levers, to which the harnesses are fastened by means of suitable strapping.

Beam stands of strong and suitable construction take care of the different warps required, *i. e.*, ground, stuffer and binder warps.

A convenient and positive take up motion finishes the loom, resulting in a loom which is ready and capable of giving a good account of itself anywhere it runs.

Another type of narrow ware loom is that for weaving Mexican sisal and such twine into different width fabrics. Generally the sisal twine is used for warp as well as filling. These looms are built in different widths and with shuttles to suit the loom's construction.

The shuttle drive is of the rack and pinion gear style, actuated by a switch. The loom is heavily constructed to stand the heavy work required of it. The harnesses are operated by means of heavy side cams

as much filling as possible. Looms of this type are used for weaving flat as well as tubular goods.

The warp, consisting of heavy sisal twine, is put up in a rack, one end to each spool, and these ends are passed around a friction or tension drum and from there all enter the reed at the same tension.

Since in an average only about eight picks per inch are used in the construction of these fabrics, it will be readily seen that these looms produce plenty of fabric. These goods are used in many places for girths, cinches, bands, etc., and take the place of cotton webbing and leather girths for pack mules. Looms of this type have been running in Yucatan for some years, giving good satisfaction although operated by decidedly unskilled labor.

From these looms of a very simple construction, one may pass to the more complicated narrow ware looms of different construction and yet all embodying the same general principle or method of moving the shuttles, *i. e.*, by the sliding rack and pinion gear.

Here one can see a loom built to carry many shuttles and to use almost any type of shuttle the purchaser may call for.

The common equipment would probably be a straight shuttle and single bank lay. When desired, looms are fitted with two banks of shuttles for weaving one fabric above the other and combining them by means of a pile warp as when making plushes.

The shuttle drive can be arranged to drive all the shuttles of both banks in the same direction at once, commonly called straight drive, or they can be arranged to drive one bank in one direction and the other bank in the opposite direction or *cross-shot*. This latter drive has the advantages of tending to balance the momentum perhaps and it is much more convenient for the weaver to change shuttles as it is possible to stop the loom in such a position as to leave the lower bank of shuttles where they are free from *cover* by the upper bank and the filling at this point can be readily changed.

Looms for velvet ribbon weaving are equipped with a "Special-Head" when desired, which makes an *Ideal Shedding Device* for the work.

When lighter work is contemplated, the looms quite often can be fitted with a suitable dobbie head. The dobbie heads are very well suited to the handling of fine silk and cotton warps and impart a very slow and steady motion to the harnesses throughout their entire change, in fact the dobbie gives about the limit of time in which a shuttle can safely travel through the shed.

Looms so far described have been of the one or two bank type with the shuttles maintaining a fixed position to the shed through which they pass. With such looms, it is possible to put but one kind of filling in the shed without changing the bobbin.

For weaving fabrics which require different fillings the lay fitted with three or four banks (drop shuttle) is used. These shuttles can be raised or lowered by a suitable device in order to bring any shuttle in position to pass through the shed at any desired pick.

With this loom, colors in both warp and filling can be handled in the same manner as in a full fancy drop box loom.

In this article some types of narrow ware looms of to-day have been briefly described. Details of construction or adjustments have not been treated. All of these machines have been described in their simpler forms. There are many devices which can be used upon them and all are designed for some special pur-