

Sketches from the History of the Textile Industry

Jacquard

By A. J. KIESER

The textile industry is rich in great inventions. But, for its age and its great importance, in comparison to other industries, it is not rich in great "inventors" who have advanced the science or technology by their genius, in spite of the names which shall be mentioned here and which shall be mentioned later on. But that does not impair the fame of the textile industry. Like a folk-song which has its roots deep in the hearts of the people but whose author no history mentions, so is technical progress which developed slowly but steadily to commanding proportions. Beginning with the first apprentice of the art, who drove poles into the earth and interlaced them with twigs and boughs of shrubs to form the first woven material, up to the complicated spinning machines and looms of our modern mills, there is an uninterrupted steady advance which only in few instances shows a more sudden increase where an individual exercised his genius for the benefit of mankind.

One of these few is Joseph M. Jacquard. His merits, his life, his personality, all combined, give us good reason to call him, with gratitude, a "benefactor of mankind."

Joseph Mary Jacquard was born July 7, 1752 at Lyons, France. There appears to be some disagreement in literature about his first name. The excellent volume, "History of the Jacquard Loom and the Result and Changes and Improvements, with a Biography of Jacquard" by Friedrich Kohl, (Berlin 1875) gives Charles Mary as his christian names. Unfortunately no authentic documents are at my disposal with which to decide the question¹, but I possess a silk fabric made in Lyons, reproduced in the accompanying cut. According to the script woven in it, the fabric dates from the year 1839 (only five years after Jacquard's death) and shows the name Joseph, which may well be considered as au-

thentic.² The combination Joseph Mary, from a religious point of view, also has much in its favor.

Jacquard's father was a foreman in a Lyons silk mill. His mother also worked in a silk mill. Young Jacquard had little liking for the arduous and, (especially for the children used as drawboys) very hard work of the silk weavers, and, therefore, became a book binder. Yet, he never forgot the sad plight of the weavers and he began to think how he might help to lighten their burden. When he, in his twentieth year, lost his father, the mother having died ten years earlier, he came into the possession of a small inheritance consisting of a little house in Cauzon, near Lyons, and a loom. It was at this time that he decided after all to become a weaver. Fortune did not smile on him; to pay his debts he had to sell his house, and without means—he had married meanwhile and was the father of a son—he directed his efforts towards "inventions" for various industries. The reward was so meager that he went to work in a quarry, leaving his family in Lyons where his wife kept a hat store.

The revolution of 1789 did not find the 37 year old Jacquard inactive. He fought at the side of his son, had to flee from Lyons, and returned only in 1796, the year before his son had been mortally wounded. Lyons also had suffered heavily: 40,000 inhabitants had perished, 10,000 had fled.

His courage unbroken, Jacquard now sought to materialize his inventive plans for weaving. Supported by backers, he succeeded in 1799 in building his drawboy machine which he demonstrated to the public at the industrial exhibition in Paris in 1801 and for which he was awarded the Bronze Medal. This machine should not be confused with his later great invention which also dispensed with the lash, and which supplanted his earlier invention so that it is not necessary to deal here with the latter.

Two years later another goal caught his attention: the solution of a prize problem for the invention of a machine for producing fish nets. He was commanded to come to Paris by General Bonaparte himself and was received there by him. In the following year he received from the society for encouraging trade development, after demonstrating this

¹The monument in Lyons also bears only the inscription "A Jacquard la ville de Lyon reconnaissante MDCCCXL." Likewise the monument in the cemetery at Oullins does not have the christian name. According to H. Grothe ("Bilder und Studien zur Geschichte der Industrie und des Maschinenwesens," Berlin 1870) a tablet, donated by the inhabitants was placed in the church of Oullins with the inscription: "To the memory of Joseph Mary Jacquard....." In spite of this Grothe heads his corresponding chapter "Charles Mary Jacquard."

²This silk fabric is 28 x 19 inches (all signatures are woven in), the size of the picture (after the well known portrait by Bonnefond) is 18 x 13 inches. I would be greatly interested to know whether and where there are other samples of this fabric.

machine, the Great Gold Medal and 3,000 francs, in addition a position in the conservatory of the arts and trades. A rich and fruitful field of activity was opened before him with this new sphere of action, An incident of the most far-reaching consequences was

immortal name but no material gain. His home town Lyons meanwhile had not forgotten Jacquard. When a man was needed to take charge of a municipal establishment, he was offered the position. After hesitating for a long while he followed the call and re-

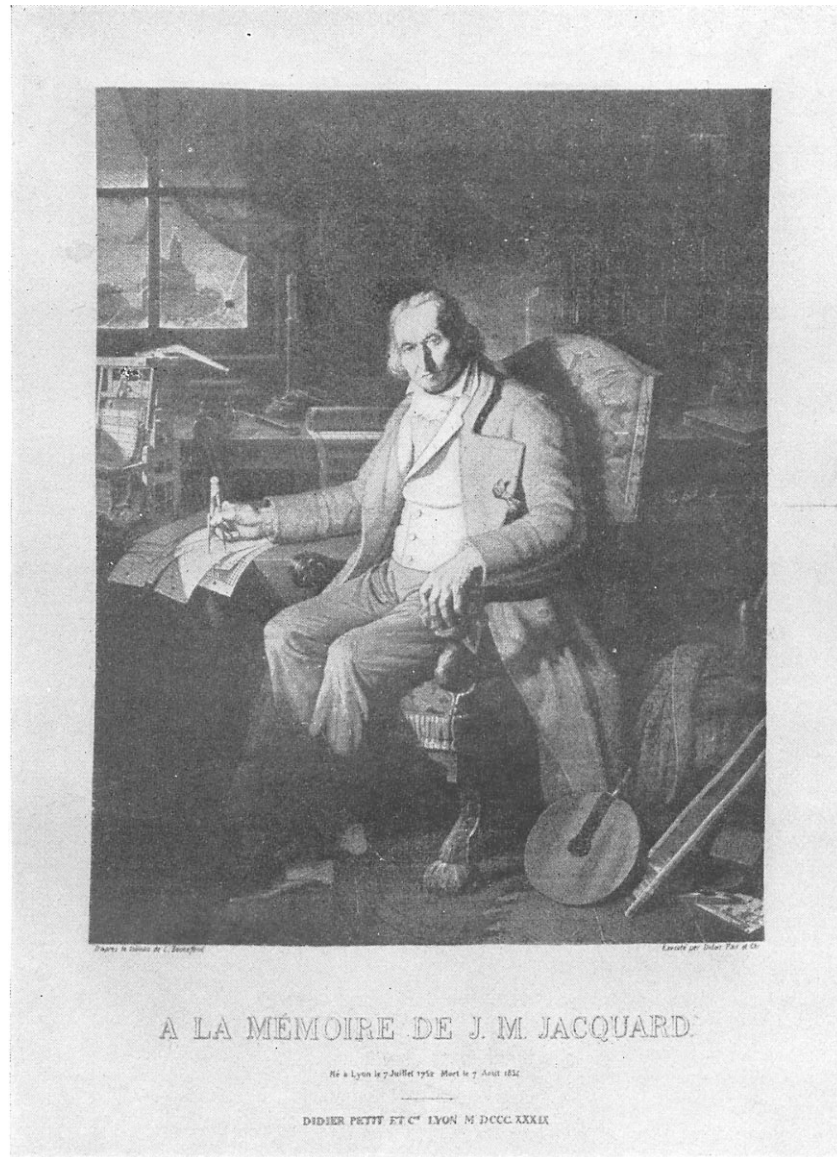


Fig. 1

that he became acquainted with the remains of a sample loom of Jacques Vaucanson which this versatile inventor (born 1709 at Grenoble, died 1782 at Paris) had at the time put up in the conservatory after his precipitate departure from Lyons, and which stimulated Jacquard now to make his great invention which brought him world-wide fame and an

turned to Lyons in 1804; he had stayed in Paris less than a year. It was in Lyons, where, probably in 1805, his great invention was completed. In the following year the municipal council of Lyons received an imperial decree to pay Jacquard an annuity of 3,000 francs for the rest of his life. In return for this Jacquard transferred his inventions and ma-

chines to the City, and also agreed to turn over to the City all future inventions in exchange for further compensations. With his new machine he again won a prize in 1808 (after a demonstration in the palace of St. Germain) and thus a recognition of his invention which soon attracted widespread attention.

Jacquard believed he had reached his goal. But he had not reckoned with the envy and begrudging malice of men. None other than those whom he wanted to help most wronged and even threatened him: the weavers intentionally manipulated his machines awkwardly and faultily, they burned some of his machines and models on public squares, and even sought his life; the window (see our Fig. 1) smashed by a stone, testifies to these outrages. Only when the persecuted Jacquard went before the public and wove a model fabric with his loom, did their attitude change and thus put an end to all reproaches and objections; the weavers of Lyons issued a public declaration in his honor, the City of Lyons not only granted him his income again, which had been withheld, but had his portrait made and woven with his loom into a silken fabric.³

At last in 1810 the Cross of the Legion of Honor was bestowed upon him, which decoration may also be noticed on Fig. 1. Stone's throw, and honorary decoration in speaking contrasts an excellent symbol of "the inventor's fate;" deepest disgrace, highest distinction, human fate eternally repeating itself.

At 67 years of age, Jacquard retired to a property in the country at Oullins near Lyons, looking at the world and his contemporaries with kindly reconciliation and contentment. Although his fame was spreading through many countries, the unselfish Jacquard had little material advantage from his work and labors. He died August 7, 1834 in his 83rd year surrounded by a small circle of his friends,

³This silk fabric is supposed to be at the museum at Lyons.

his wife had preceded him in death, while in and about Lyons alone, on more than 30,000 looms the master's immortal genius sped economical production. He was buried in the cemetery of Oullins. A monument, suggested in 1834, could be erected only in 1840, on Sothany Plaza, after foreign countries had generously contributed, as the inscription says: "By the grateful city of Lyons."

What, in technical respects, was the achievement of Jacquard? As familiar as every expert is with the essence of his great inventions, as a matter of course, it is very difficult to express it in one short sentence, duly considering the work of his forerunners.

For Jacquard also had his forerunners and he, like so many great inventors, has not been spared the accusation to have claimed wrongfully for himself the merits of others, or to have skimmed the cream off the milk of others. It is, therefore, necessary to go into this matter in more detail and to briefly throw some light upon the inventions of his two forerunners which come in question here, namely Falcon and the already mentioned Vaucanson. For this purpose we may use a publication which appeared in 1808 in the "Annales des Arts et Manufactures," volume 30, page 214,

where it reads (according to Kohl):

"Loom, with which all kinds of figured fabrics may be produced without using a lash.

"The society for the encouragement of the national industry has donated a prize of 3,000 francs for a loom which can be used for the weaving of figured fabrics without the aid of the lash. This prize has been awarded at the last convention to Mr. Jacquard of Lyons. His loom which has been accepted and used in several mills for more than two years undoubtedly offers convincing proof of the advantages which it promises. This loom embodied the happy application of two ingenious contrivances which weaving originally owes

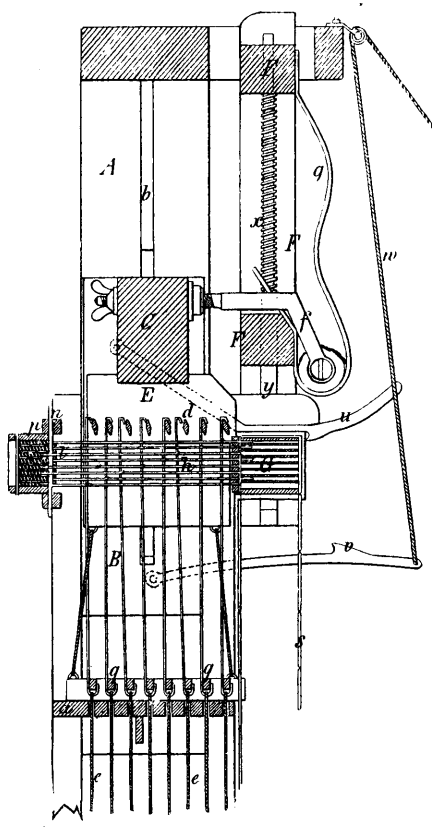


Fig. 2
The Jacquard-Loom.

to Falcon and after him, to the famous Vaucanson.

“Used alone, these two mechanisms contributed towards the same end but they did not reach it; combined with the intelligence and perfected with the improvements of Jacquard they are a complete success which cannot be denied. The loom from which Jacquard derived the idea of this combination is Vaucanson’s which is exhibited in the halls of the Conservatory in Paris. It had been tested many times by craftsmen and manufacturers who visited this institution but was never reproduced because it is very complicated. The inventive genius of Jacquard grasped the essential feature and knew how to apply it purposely. This is a striking proof that an abandoned mechanical device may arouse the idea for a new one as soon as the eye of a true artist discovers the good and applies it to advantage.

“A brief description of the machine as developed by Jacquard, here is in order. The mechanism which was invented to take the place of the harnesses, consists of hooks, on which cords are fastened, these cords hold individual heddles, which comprise the lacing

of the loom, and is constructed in a similar manner to the Vaucanson machine.

“These shaft stave hooks are raised or lowered by means of a cast-iron griffe, which is fastened to a plunger, operated by the foot of the operator. A series of perforated cards, which correspond to the pattern of the fabric, are arranged in an endless way, the length of which corresponds to the length of the pattern in the cloth. These cards are laid over a needle board in the upper part of the machine. When the machine is at rest, all hooks stand erect and rest on the griffe which lifts them singly or as a group. Every time the operator steps on the foot pedal, one card is brought into motion, which in turn forces certain needles away from the griffe and allows others to remain there. This causes certain hooks to be raised with the griffe and others to remain down.

“A large number of cards, which are laced into a continuous chain, can be rearranged or replaced very easily, according to the will of the designer or the manufacturer. This is a simple and most sensible means of arrangement of these cards. Jacquard’s knowledge of the art of printing had enabled him to ap-

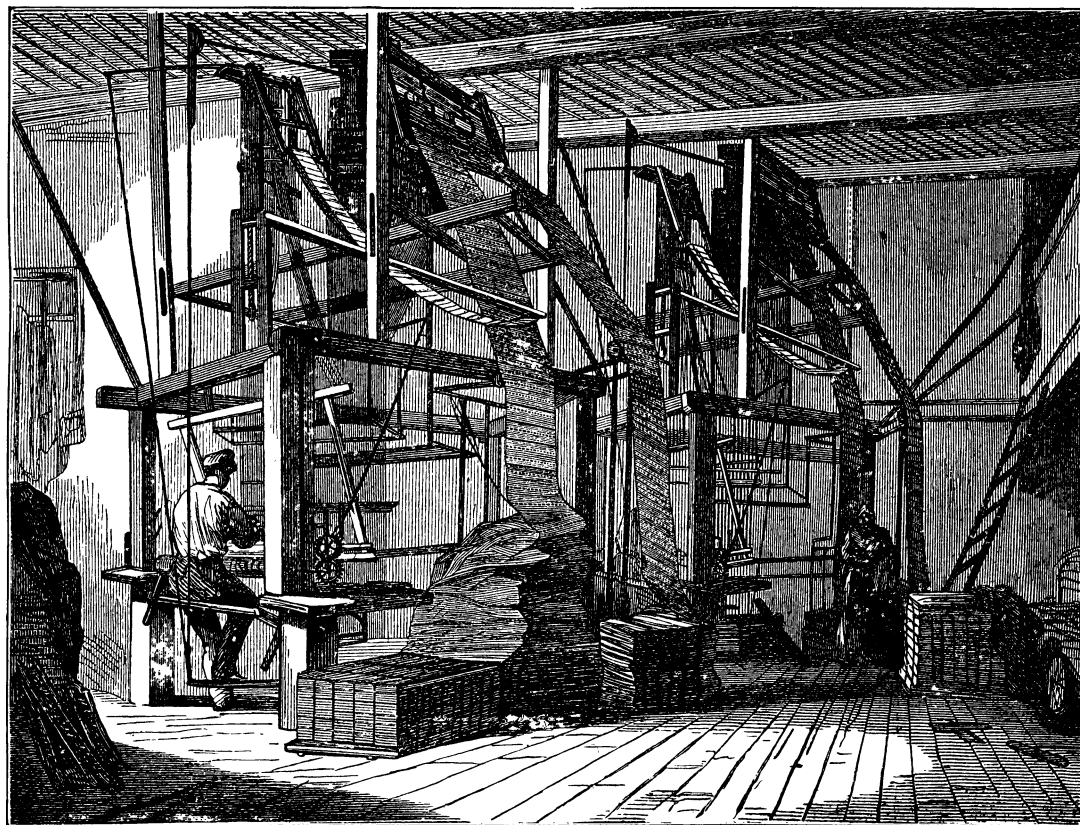


Fig. 3. Jacquard-Loom with foot-pedal from the forties.

ply the principle to this machine and by means of his cards could make any pattern that may have been desired. By means of these simple devices, any operator of average intelligence can read with ease and accuracy all types of patterns, which enables him to perform work in one hour which heretofore required many days."

As early as 1728 Falcon had perfected a sample loom which utilized hooks with needles, a prism with four sides and cards; however, the prism had to be moved and kept revolving by a second person. It was small and the strips of cardboard were narrow so that only small designs were possible. Vaucanson (in 1745), therefore, replaced the prism with a large drum.

Jacquard who, in his already mentioned position in Paris, had become acquainted with Vaucanson's invention and who had built such a machine with odd pieces could honestly declare that in spite of its costliness and intri-

cacies only small designs could be woven, and that because of the many parts causing excessive friction it ran but slowly and awkwardly.

It seems that Falcon's machine was not at all known to Jacquard.

The way in which Jacquard's great masterpiece conquered the world has only few parallels in the history of the textile industry. Due to the unselfishness of its inventor even without patent protection, the loom has become the starting point for a whole string of patents of different countries improving it or changing it. Initially meant for the silk trade, it has gained use for the weaving of all types of yarns and proved applicable to all fabrics from the finest to the coarsest.

If, therefore, on Jacquard's monument this inscription may still be read: "The Grateful City of Lyons," it may serve as a symbol for the phrase: "The Grateful Posterity."