

CARD CLOTHING.

EXPLANATION OF THE TERM. — CARDING AMONG THE ANCIENTS. — CARD-MAKING BY MACHINERY. — THE EARLIEST KNOWN ATTEMPTS. — THE BUSINESS DURING THE LAST CENTURY. — DURING THIS CENTURY. — THE USE OF DOG POWER. — THE CONDITION OF THIS INDUSTRY FORTY YEARS AGO. — THE SARGENT CARD CLOTHING COMPANY. — DESCRIPTION OF THE ACTION OF THEIR MACHINES. — THE ACCURACY OF THEIR MOVEMENTS. — THE DAILY PRODUCT OF A MACHINE. — THE EXTENT OF THE PRODUCTION IN THE UNITED STATES. — THE CAUSES OF THE SUCCESS OF THE SARGENT CARD CLOTHING COMPANY.

THE term “card clothing” is used by manufacturers to designate the “cards,” or species of comb, used in the manufacture of cotton and woollen cloths, for the purpose of carding out the fibres and arranging them in even and parallel lines, preparatory to spinning them into threads. From the very earliest times some appliance must have been used for the purpose of transforming the tangled masses of wool or cotton, which were destined to be spun, into an even texture, which could be used for this purpose.

Among the ancients, most probably, a utensil resembling a comb was used, and the wool or cotton was combed out. In modern times, even when all the spinning was done by hand, the cards were made of bits of wire, fitted into a strip of leather, or of wood. These were the hand-cards which those of us who are old enough to remember the time when spinning was the regular occupation of the women in every family, must have frequently seen in use.

With the introduction of spinning by machinery, the process of carding has come to be carried on in the same way, and “card clothing” is the cards made in strips long enough to cover the large cylinders in which this operation is now performed in our manufactories.

The making of cards by machinery is also one of the novelties of the modern era of industry, and the machine with which this

difficult and delicate process is performed is also an American contribution to the mechanical progress of civilization.

During the colonial period of the history of the United States, the manufacture of hand-cards, by the process of hand labor, was an important branch of the industry of the country. This method of manufacture continued in use until this century, though various attempts had been made to substitute machine labor for it.

In 1775 Nathaniel Niles, of Norwich, Conn., set up in that place a manufactory for making the wire to be used in making cards; and the Assembly, in view of the importance of the project for the manufacture of cotton and woollen cloth, granted him, in answer to a memorial addressed to this body by Mr. Niles, a loan of three hundred pounds for four years. This manufactory was continued in operation during the war of the Revolution.

Following the example thus set, several other of the legislatures in the colonies recommended the manufacture of cards, with other appliances for the production of textile fabrics, and encouraged them by bounties or loans.

In 1777 Oliver Evans, one of the most distinguished pioneers in the army of American inventors, being then a young man of about twenty-two, having been engaged in manufacturing the teeth for cards by the hand process then in use, invented a machine for manufacturing them, which is said to have been efficient, and to have produced them at the rate of three hundred a minute.

He made proposals to the state for aid in establishing a factory for drawing the wire and making it into card-teeth by the machine, in less time than it took to coil the wire into hanks. His proposals not having been accepted, he sold his invention to private parties; but it does not appear that it was put into practical operation.

It is also stated that he subsequently invented another machine, which would prick the leather, and cut, bend, and set the teeth, but which he abandoned for personal reasons.

In Massachusetts, in 1788, Giles Richards & Co. began in Boston the manufacture of cards with machinery, which, it has been suggested, was that invented by Evans. In 1793 there were three manufactories of cards in Boston, with an annual production of twelve thousand dozen cards, all of which were, of course, hand-cards. Nor were these the only manufactories in Boston, or in the state.

In 1784 a machine was invented by Mr. Crittenden, of New Haven, Conn., which cut and bent the teeth, and was capable of producing eighty-six thousand in an hour.

In 1796 Amos Whittemore took out a patent for an improvement in making cards.

During the early part of this century the making of cards increased, and became an important branch of industry in the country. Machines were used quite generally, and were frequently run by dog power. New England was the chief seat of the manufacture, and Mr. Joseph D. Sargent, of Leicester, was one of the largest producers of cards in the country.

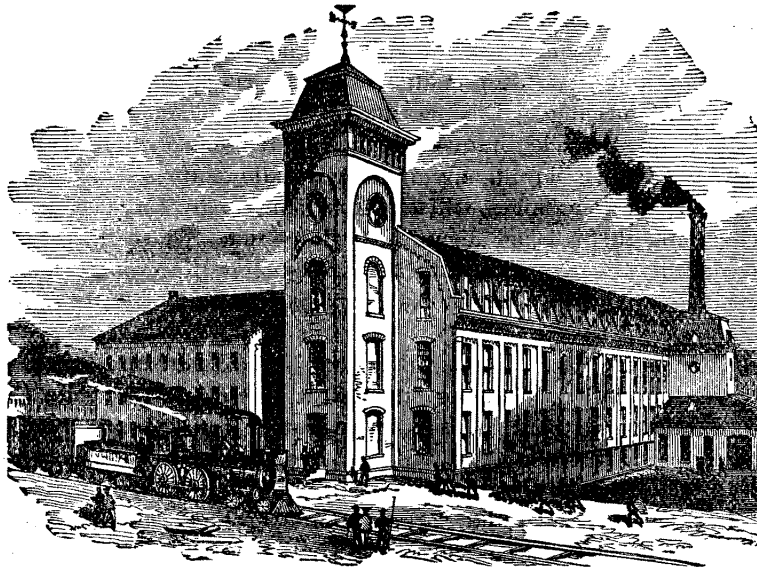
He at first used dog power for cutting the teeth by machinery. A dog was able to run about six machines, each of which would cut about twelve pounds of teeth in a day, from No. 32 wire, or wire of medium size. The daily product of each machine was enough to cover about twelve square feet of leather, or "fillet," as it was technically called.

These teeth were put up in bags, and distributed to the residents of the vicinity, who stuck them into the leather, and returned the cards. All through Worcester County, Mass., card-making was a recognized business, and frequently a factory sent out its work within a radius of twenty miles. Men, women, and children engaged in it, and some of them made it their sole occupation. The pay for the work averaged from twenty-five to forty cents, according to the fineness of the teeth, for a "sheet," which averaged five inches in width by thirty-six inches in length. For setting the teeth in a "fillet," forty feet long by an inch and a half wide, with which to cover the small cylinders on a carding machine, the price in those days was two dollars and a half. Women and girls were found to be the most expert workers, and were very generally engaged in this work when there was a factory in the vicinity. Foreign labor was then almost unknown in the United States, and the ancestors of many of the richest and most influential families of the present day were, as girls, engaged in the work of card-making.

Machines for forming the teeth were then in use, and though most of the wire used was imported, yet wire was then made in the country, a factory at Leicester, Mass., being driven by a wind-mill. In 1812 the largest card factory at Leicester, Mass., employed about eighteen hands in the cutting of teeth, two thirds of whom were girls employed in turning the machines.

Until within about twenty years this town was the principal seat of the card manufactory in the United States, and is to-day one of the richest towns of its size, as the result of its devotion to this industry.

The leading representative house engaged in the manufacture of card clothing is the "Sargent Card Clothing Company," of Worcester, Mass. The business has partaken of the great industrial activity of the present century, and is now one of the most important industries of the country. This company was formed by its president, Mr. Edward Sargent, the son of the late Joseph D. Sargent, of Leicester, who was in the business of manufacturing cards as early as 1812; and under his management the company holds the first rank among the firms engaged in this branch of business, producing daily about seven hundred square feet of card clothing, besides about two hundred dozen pairs of hand-cards.



WORKS OF THE SARGENT CARD CLOTHING COMPANY, WORCESTER, MASS.

The operations are all carried on by machines, which are an improved arrangement upon a machine invented by a Mr. Smith, who is said to have realized but little from its invention. It is a combination of a "drawer," a "cutter," "doubler," "pricker," "second bend," "dogs," and "feed-wheel," as the principal parts. The wire is placed upon a reel beside the machine, and one end of it being placed by hand in the "drawer," all the other processes of the work are done automatically by the machine.

The leather in which the teeth are to be set is "fed up" from beneath the machine, and drawn gradually along, as the teeth are set, over a pulley set in the ceiling above.

The "drawer" pulls along enough of the wire to make a tooth, and places it in front of the "doubler," where it is cut off by the "cutter," and seized in the middle by the doubler, and bent into the shape of a card-tooth, ready to be inserted in the leather. At the same moment the tooth is driven into the holes in the leather, which the "pricker" has made just before for the reception of the two prongs of the tooth. Then the "plate," a portion of the "doubler," sticks the tooth nearly its full length into the leather, when the shoulder of the pricker, as the latter makes the holes for the next tooth, finishes sticking the tooth in and fastening it.

These machines are so accurate in their movements, that, should the wire give out or prove defective, or any of the operations be imperfectly performed, the fact is discovered by another portion of the machine, which keeps a constant and vigilant scrutiny over the work, and by a "stop motion," as it is called, stops the working of the machine. This portion of the machine is, however, more frequently called into action by imperfections or kinks in the wire than by a failure in any of the automatic motions.

One of these machines will set about four square feet of teeth in ten hours, there being about thirty-three thousand teeth, or, as technically described, sixty-six thousand points to a square foot, making about two hundred and sixty-four thousand points set in a day.

The Sargent Card Clothing Company's Works are spacious and handsomely built. They are situated at the side of the railroad, so as to forward their goods economically. In the United States there are about twelve hundred card clothing machines in operation, producing daily about thirty-six hundred square feet of "clothing," of which the Sargent Card Clothing Company produces about one fifth, or seven hundred feet a day, besides the hand-cards they also make. The successful organization of this leading business in this specialty is due chiefly to the ability with which it has been managed by Mr. Sargent, who devotes his entire time to it, and to the high reputation the company has always enjoyed for the probity of their dealings and the excellence of their products, it having been an invariable rule from the beginning that no goods of theirs should leave the establishment unless they were perfect of their kind.

