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Improvement in Knitting Machines.

The Lamb Knitting Machine, of which the accompanying engraving is a representation, was patented through the Scientific American Patent Agency in December, 1863. Since then valuable improvements have been added, and at the present time it is claimed to be the best family knitting machine that is manufactured.

The invention relates to that class of knitting machines that employ straight rows of needles, in distinction from the class known as circular knitting machines, but more particularly to the simple and novel method of operating two straight parallel rows of needles in such a manner as to produce a tubular web, to widen and narrow with facility, to form a large or small stocking in the same machine, to knit the heels of stockings, and to produce various styles of ornamental and ribbed work in flat web.

The machine may be described in brief as follows: A needle bed or frame (which can be attached to an ordinary table by means of a thumbscrew), having its two upper sides inclined toward each other, their upper edges being separated far enough to allow the fabric produced to pass down between them. Supported by the needle bed is a carriage, reciprocated by means of a crank. Through the arch that passes over the top of the machine is a horizontal rod upon which moves a slide that carries the guide for delivering the yarn into the hooks of the needles. parallel grooves or channels are cut across the bed in which the needles are placed. In these grooves the needles can be moved their entire length, and can thus be brought into operation for widening, or thrown out of operation for narrowing without removing them from the machine.

Fig. 2.

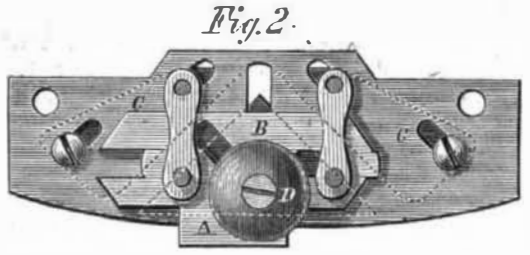

Fig. 1

THE LAMB PATENT KNITTING MACHINE.

The needles employed are self-knitting, being constructed in such a manner that when fed by the yarn and carried an inch forward and back, they form the loops by their own action. The lower ends of the needles have an upright shank, extending above the face of the needle bed, and are operated upon by cams that are attached underneath the center of the carriage in such a manner as to move the needles forward and back. There are two sets of these cams, one for each row of needles.

Fig. 2 is a representation of one of the sets of cams, which consists of the plate, A, the two wing cams, C C, and the V-shaped cam, B, which is held in place by the screws that pass through the washer, D, in the diagonal slot of the plate, A. As the carriage to which these cams are attached is drawn back and forth over the needle bed by the crank, the needles are carried up on one side of the V-shaped cam in the groove or space between that and the wing cams, at the same time the yarn guide delivers the yarn into the hooks of the needles, which are then drawn down by the wing cam on the other side of the V-cam, thus forming the loops.

The slide, A, is made to shift, by its lower projection coming in contact with adjustable cam stops that are placed at the ends of the needle bed. In Fig. 2, when the plate comes in contact with the right-hand cam stop, the screw through the washer, D, is forced up the diagonal slot, and brings up the V-shaped cam, thus closing the space between it and the wing cams. When closed the needles pass below the cam without operating. By the adjustment of the cam stops either or both of the cams may be left open or closed at the same time, so as to operate the two rows of needles separately, alternately, or together: thus forming four entirely distinct webs—the tubular web, wide flat web, double flat web, and the ribbed flat web.

As any number of needles can be moved up at the start or be moved up or down at either end of the rows of needles at any time, so any size of web can be set up and any number of loops can be added to or taken from it at will. By thus knitting the fabric either tubular, or flat, single, double, or ribbed, in any desired shape, it will produce every variety of staple and fancy-knit goods.

The loops are formed on precisely the same principle as in hand knitting, but, being of uniform length, render the fabric more elastic and durable.

The proprietors say that in addition to the great capacity and completeness of this machine, it especially commends itself to families for its extreme simplicity, enabling any one to operate it from printed directions. The ordinary speed of the machine is about 5,000 loops per minute, producing a yard of plain work in ten minutes, and a pair of socks complete in half an hour. Although it has been but a short time before the public it has attained a reputation and sale during that time which evinces that the want of such an invention is universally felt.

As the patents of the Lamb Machine cover the principle of crossing two rows of needles so as to form loops on both sides of the fabric; and as it can be worked with far greater speed than other machines—can knit with any number of needles, and widen and narrow at will on both circular and flat webs, (either single, double, or ribbed)—and is capable of producing anything, from a watch cord, infant's stocking, or glove, to a shawl or blanket—its value must be admitted.

All are familiar with what the sewing machine has done in furnishing profitable employment to thousands of laboring women. May not the knitting machine be welcome as a labor-saver, and a source of livelihood for the poor?

Certain it is that between five and six million dollars worth of knit goods are annually imported to this country, and that our markets abound with the raw material of which these goods are fabricated.

These machines are manufactured by the Lamb Knitting Machine Manufacturing Co., of Chicopee Falls, Mass., who will cheerfully furnish to any address any other information respecting the machines, with samples of work.

New Facts in Acoustics.

M. Regnault, of the Institute of France, has been making use of the new sewers of Paris for the purpose of testing, on a large scale, some of the questions in acoustics concerning which there has been much doubt. By firing a pistol in tubes and sewers of various diameters, he found that the sound was carried to the following distances: 1,282 yards in a passage of 4·2 inches diameter; 4191 yards in a passage of 11·8 inches diameter; 10,494 yards in a passage of 43 inches diameter. The nature of the materials and the construction of such passages exercises great influence on the rapidity with which sound is transmitted. In the large Paris sewers, trumpets are used to convey orders to the workmen, and it is found that in those passages whose sides are cemented, the sound is conveyed to a much longer distance than in others whose sides are left as first constructed, with the rough stones only. It is one of the primary principles laid down in text books, that the velocity of the vibrations of sonorous bodies in the same medium is the same for all sounds, grave or sharp, strong or feeble, and whatever may be their pitch, but the researches of M. Regnault would seem to show that this generally received belief is not correct. He asserts that sounds of different pitch are not propagated with equal rapidity but separate from each other on the way.

Acute sounds, also, travel with less swiftness than grave ones; thus, when a baritone sang in very long sewers and at the entrance of water conduits, the key-notes were heard at a distance before the harmonics which succeeded it and one another, according to the degree of their altitude. The propagation of sound, consequently, disarranges the harmonics of which it is composed; thus an air embracing a certain extent of the gamut, if heard at a long distance would be seriously altered. This decomposition in tubes may be on account of the friction caused by the sides of the tube or passage way, and cannot be noticed in the open air. The facts propounded by M. Regnault will cause the philosophers to renew their investigations with renewed interest.

LOFODEN NORWEGIAN COD LIVER OIL.

The London *Pharmaceutical Journal* has published a very readable, though somewhat exhaustive article, concerning cod fishing on the Lofoden Islands, the mode of manufacture and other particulars respecting the far-famed Norwegian cod liver oil, much of the information never before having been published. The great length of the article forbids our transferring it entire to our columns, but some extracts will prove of interest.

Every year, early in the month of January, the cod fish begin their great migration from the deep sea. Moving in a northeasterly direction, they approach the coast of Norway and concentrate themselves upon the Lofoden Islands, situated near the northern extremity of Norway, about 150 miles within the Arctic Circle. Immediately on the appearance of the immense shoals of cod at Lofoden, a remarkable result ensues,—all other kinds of fish disappear with one consent. The exact cause of this curious phenomenon is not yet understood, but literally it is the fact that the very herrings used as bait can no longer be taken in those waters, but have to be imported from a distance, and are sold to the fishermen as articles of trade. Two important consequences attend this singular circumstance; one, that the fecundated roe, secure from the predatory attacks of many voracious enemies, has a favorable opportunity for development, whereby a large supply of this valuable fish is maintained; the second, that no other fish than cod can be taken in the nets, and consequent-