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2 Sheets-- Sheet 1

J. GOULDING.

MODE OF MANUFACTURING WOOL OR OTHER FIBROUS MATERIALS.

Reissued July 29, 1836

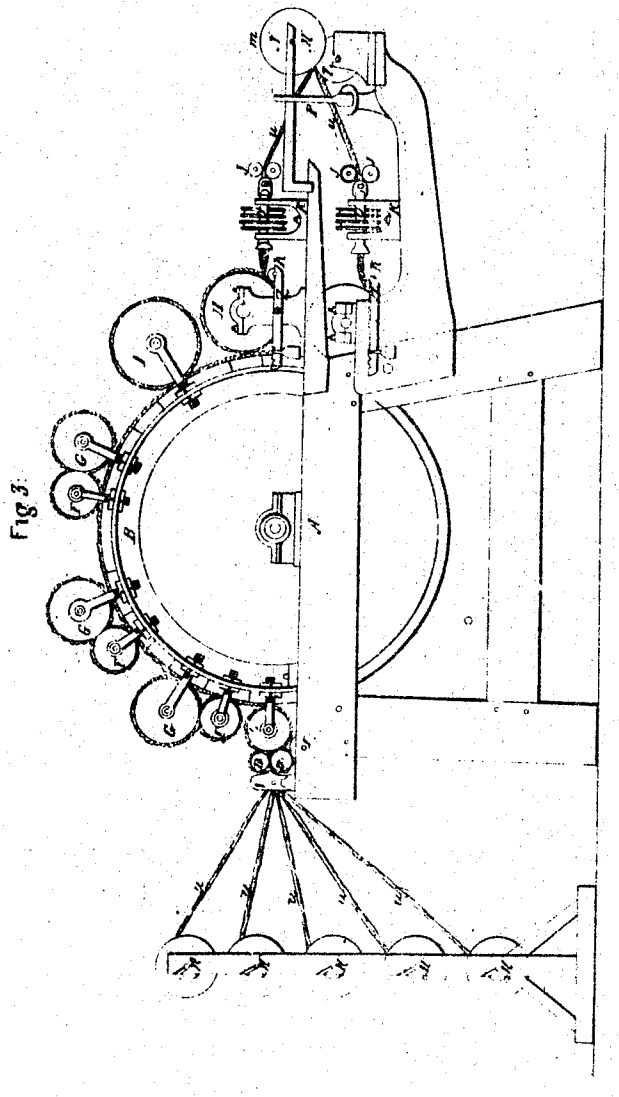


Fig 3.

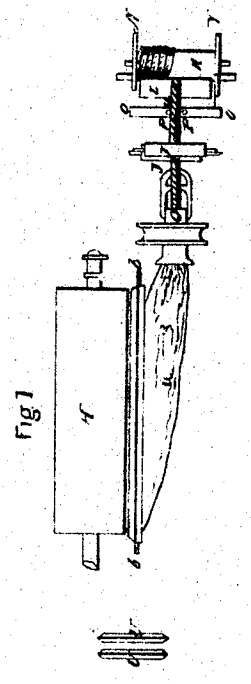


Fig 1



Fig 6

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Fig 4.

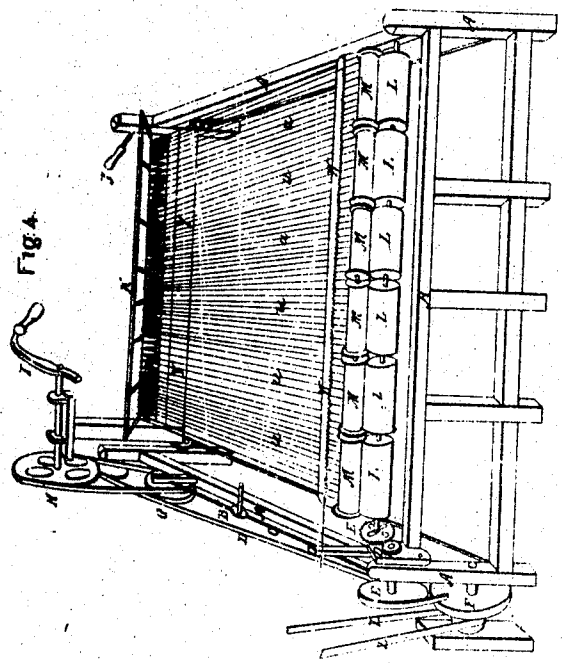


Fig 5

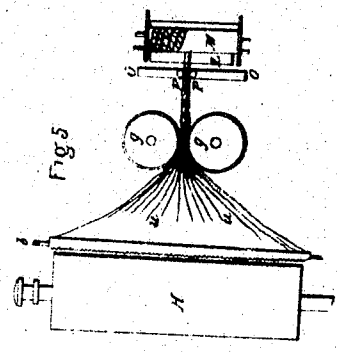


Fig 2

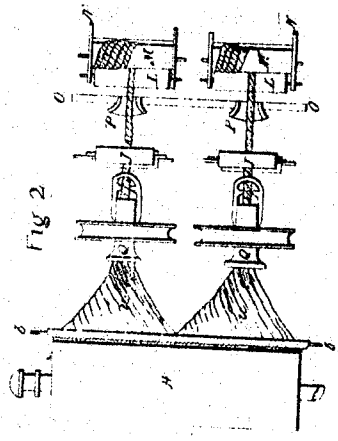
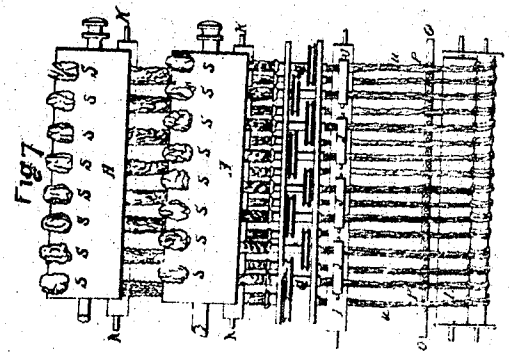


Fig 7



UNITED STATES PATENT OFFICE.

JOHN GOULDING, OF DEDHAM, MASSACHUSETTS.

MODE OF MANUFACTURING WOOL OR OTHER FIBROUS MATERIALS.

Specification forming pa. f Letters Patent No. 2, dated December 15, 1826; Reissued July 20, 1836.

To all whom it may concern:

Be it known that I, JOHN GOULDING, of Dedham, in the county of Norfolk, in the Commonwealth of Massachusetts, have invented, constructed, and applied to use a new and useful Improvement in the Mode of Manufacturing Wool or other Fibrous Materials, for which the Letters Patent of the United States of America were granted to me bearing date on the 15th day of December, A. D. 1826, and the specification thereto annexed through inadvertence and by mistake not containing an exact, full, and precise explanation of the invention which I, the said GOULDING, claimed as my own, and for which I desired the said Letters Patent should be issued, and there is reason to apprehend that said Letters Patent may be inoperative or invalid by reason that the terms and conditions prescribed, by the act of Congress in such case made and provided, have not by such inadvertence and mistake been complied with on the part of the said GOULDING, and I, the said GOULDING, in conformity with the provisions of the act of Congress in such case made and provided, have surrendered unto the Secretary of State of the United States the said Letters Patent to be canceled, annulled, and made void, I do now hereby declare that the following specification of my said improvement contains a full and correct description thereof, and the invention which I claim as my own is set forth in those full and exact terms in which they should have been made in the original specification upon which said Letters Patent were granted. The more fully to point out said improvement and invention it is necessary to refer to parts of the machinery which I do not claim and to the drawings which accompany and are to be considered part of this specification.

Figure 1, represents one of the delivering card rollers, H, of the first carding machine, and which is covered all over with spiral fillet of wire card, as usual in such machines. The great cylinder of the machine being regularly fed by means of the common feeding cloth, upon which a certain weight of wool, cotton, hemp, or other fibrous material is spread, uniformly over a certain space, in the well known and accustomed manner, I can take away the sheet of carded material *u*, previously freed from the delivery card rollers, H, by means of the comb, *b*, *b*, either laterally to the right or left, by means of two delivering rollers shown at, J, J, through the turning tube or pipe, *q*, to which a slow rotary movement is given, by means of a band passing from a drum actuated by the machine, operating upon the pulley affixed to the tube. To the mouth of the tube, a loop of brass or iron wire is affixed, having also a bar of wire across it, over which the roving or sliver after being passed through the tube is laid, and then passed underneath the loop in the manner shown. The roving or sliver in passing through the tube, is formed into a loosely combined cylinder, which is guided between the drawing rollers J, J, and thence passed around the bobbin, M, which is retained by means of its larger ends N, N, and its axis upon the periphery of the drum, L, upon which it rests, and partakes of the rotary movement, communicated to that drum by the machinery. The roving or sliver may be evenly wound upon the bobbin M, either by carrying it and the drum L, backward and forward, or by passing it between guides P, P, affixed to the bar, O, to which a similar lateral movement is communicated, as will be described. The same apparatus may also be used in front of the delivering card roller, H, as shown on Fig. 2. The rovings, or slivers thus prepared by the first carding machine, are then to be placed in a frame, similar to that shown in Fig. 3, of this drawing, and to be passed through the second carding machine, being also guided into the machine between dividing pins. The two carded sheets, U, U, after being taken off from the delivering card roller H, by the comb *b*, *b*, are then passed straight through the rotary tubes, 2, 2, where becoming rounded, they are received between the drawing rollers J, J, and put through the guide pins P, P, and finally wound upon the bobbins M, M, in the manner before described. The slivers, or rovings, are then to be passed through the third carding machine, which is exhibited in a side elevation at Fig. 3, A. The machine frame shown as being made of wood, but it may also be made of cast iron.

B is the arch which carries the bearings of the carding rollers, G, G and C, and other cleaning rollers F, F, &c., C, the great or main carding cylinder; D, D, the two feeding rollers covered with ribbons of wire card, (or channeled on fluted rollers may be employed instead of them) which deliver the rovings, or slivers, to the receiving card roller E, from which they are transferred upon the great or main carding cylinder C. The lower small roller F, covered with wire cards, is intended to clear the feeding rollers D, D, of any loose fibers which may adhere to it, and being also in slight contact with the receiving roller E, it transports it to those loose fibers. The two delivering cylinders H, H, being placed one above the other, are each furnished with fillets of card, and alternate spaces between them, left unclothed with card in a similar manner to that shown in Fig. 7, as will be described hereafter.

Instead of taking off the carded materials by means of a comb as described in the references to Figs. 1 and 2, I can remove them from the delivering cylinders H, H, by means of the rotary action of the tubes 2, 2, &c., upon them, which gathering the filaments delivered from each fillet of card around the rollers H, H, from them into a continuous and loosely coherent roving or sliver U, which is drawn by the action of the rollers J, J, through which they are passed, and is to be guided between upright pins, one of which is shown at P, and wound upon the bobbin M, in the manner already described. In further aid of the rotary action of the tubes 2, 2, &c., I can also employ the two plain rollers K, K, which are lightly held or pressed against the surfaces of the delivering rollers H, H, by the action of weights hung upon the opposite ends of levers, which support the rollers, K, K, as shown at R, R, are the supports or carriages in which the tubes 2, 2, turn. The small cylinder I, covered with the wire card, serves partially to disengage and loosen the fibrous material from the surface of the great cylinder C, and to prepare it for being more readily taken off by the delivering rollers H, H. The upper card cylinders, F, F, &c., are for the purpose of clearing the working cylinders G, G, &c., from the wool, cotton, or other fibrous material, and again transferring it to the main cylinder C. The bobbins M, M, &c., filled with the rovings or slivers, from the second carding machine, are to be placed in a frame, as shown, and each roving, or sliver, must be passed through a division, made in a number of upright wood or metal blocks, affixed upon a rail, and one of which is shown at V. The blocks must be made broader in front, next to the rollers, than behind, as shown in Fig. 9, which represents the plan of two of them, and the intervals between them must be narrower than the blocks in the proportion of three to five, or thereabout, so that each roving or sliver, may preserve its proper situation upon the main cylinder, and the working cards, without mingling with those next adjacent to it during the operation of carding, and finally be received in its place upon the delivering card H.

Fig. 7 is a plan of the two delivering cards H, H, S, S, &c., the circular strips or fillets of wire card around it; the under delivering card having also similar strips of wire card surrounding it, but so placed as to correspond with the spaces left empty upon the uppermost one, U, U, &c. In this figure as well as in Fig. 3, represent the rovings or slivers, passing from both the delivering cards H, through the revolving tubes 2, 2, which are fitted up in a similar way to those already described. The rovings or slivers being drawn forward by the rollers J, J, &c., the carding, rovings, or slivers also pass through the guides P, P, and are wound upon the long bobbin M. The fibers of the rovings or slivers are apt to wind around the drawing rollers J, J, &c. In order to prevent this evil it is well to give the uppermost of each pair of rollers a slight degree of lateral motion backward and forward so as to cross their circular motion; and which lateral movement may be effected in various ways, by the machinery not necessary to be described here. The guides P, P, of the third carding machine, must have a backward and forward lateral motion, communicated to them either by a heart movement or in any other fit and proper manner, so as to lay the rovings or slivers regularly side by side, each within its own proper limits. The smaller the rovings or slivers become, so much the more will they require to be twisted, by the action of the revolving tubes 2, 2, upon them, in order to give them a sufficient degree of coherence. In case of carding long wool where it is desirable to keep the fibers straight and smooth, as in the manufacture of worsted for instance, the wool must be taken off the delivering card H, Fig. 5, by means of the comb *b*, it then passes between the two vertical rollers G′, G′, which are covered with leather, and have each, a slow alternating upward and downward movement, communicated to them by the machinery and which together with the rotary movement of the rollers draws forward, gathers up, and condenses, the carded sheet of wool U. It is then guided between the pins P, P, to which the lateral movement is given as before described, and wound upon the bobbin M. This operation is equally proper for cotton, or other fibrous materials, when it is desirable to keep the fibers straight, and

smooth. In order to render the wool more pliant, it may be heated or moistened by steam, or hot water, in this latters process.

Another method of drawing forward, condensing, and gathering all descriptions of fibrous substances after carding them, is seen in an end view, at Fig. 6, where H, is the delivering card cylinder; and the comb which removes the carded material, from the cylinder H, and which is then passed underneath the small plain roller C, which is covered with leather, and under the roller *e*, which is also covered with leather; and to both these rollers *c* &c., a lateral backward and forward movement is given, by the machinery and which varies in extent according to the coarseness, or fineness of the carded sliver, or roving. The rollers *c*. and *e*. also receive a rotary movement, from the endless web, strap, or band of leather, *f*, and which extends the whole width of the cards. This endless web revolves around the rollers *d*. *d*. to one of which a rotary movement is communicated, by the wheel work of the machine. The transverse rubbing action of the rollers *c* and *e*, rounds and condenses the fibers of the carded materials U, U, and C. which are afterward wound upon the bobbin M, as before mentioned.

Fig. 4, is a general view of part of a mule or spinning frame; X, X, X, are the spindles, Y, the carriage made as usual; L, is a drum on the periphery of which the bobbin M, containing the carded roving, or sliver rests, as in the before mentioned cases, but here instead of winding the roving or sliver upon the bobbin M, it is employed to give it off, at the proper times and in the quantity required for spinning, by means of a rotary motion given to the bobbin by the drum, in a direction opposite to that in which the bobbin would move to wind up the roving. The motion is given to the drum L, from the machine, at the required time by any fit and proper contrivance, but which need not be described here. The roving or sliver U, delivered off from the bobbin M, passes between a pair of jaws W, W, which are made to close upon and retain it at proper times, and to open again by the action of machinery as usual. Or instead of jaws grooved or channeled rollers may be employed for a similar purpose. The roving or sliver of wool, is spun without the use of it, ought not however to be stretched more than one fourth of its length. The rotary motion of the delivering cards H, H, of the drawing rollers J, J, and the drums L, L, in all the machines described must exactly coincide with the nature of the material operated upon, so that the rollers J, J, shall draw it along as fast as it is freed from the delivering cards H, H, and the drum L, L, wind it upon the bobbins M, M, regularly and with the proper degree of extension, without overstitching it. Drums L, L, actuated by the machinery, may also be used, in unwinding the rovings or slivers from the bobbins M, M, in all cases where the rovings or slivers are too weak to bear drawing off from the bobbins, without such help, and whether such slivers or rovings, have been made by the machinery herein described, or by other method. In the second carding process it is expedient that twenty at least of the bobbins M, M, filled with rovings or slivers from the first carding machine, should be passed at once through the second machine, if of two feet wide they being equally distributed along it at the feeding. If they are to be divided into two or more rovings or slivers than an upright angular block of wood, similar to those shown in Fig. 3, but the breadth of an inch at the broadest end, must be placed at each division, to maintain a similar separation throughout the carding operation. The wool, or other material is taken away from the carding machines, while it is being delivered from the fleece or sheet, as shown at U, Fig. 1, where it is seen in its progress toward the conical tube 2, and the bobbins M, upon which it is finally wound, after receiving a countertwist by the revolution of the tube 2, or by rollers *z*, *z*, Fig. 5, or by other similar apparatus. The sliver slubbing, or roving, whether consisting of one or more strands, is received or wound by means of drums upon the bobbins, upon the principle represented in Figs. 1, 2, 3, 5, 6, and 7, and described in the foregoing specification. The strands in the second carding operation, before explained, are fed to the card, from any requisite number of spools, M, M· *u*, *u*, Fig. 3, which however exhibiting the third operation differs in the part marked V, which is not there used. The strands being separated, and distributed, in the second carding operation, by means of wire pins, or similar apparatus, to guide them to their proper places along the card. In the third carding operation, the strands are fed to the card, and conducted so as to cause the sliver, slubbing or roving, to be even, and of a uniform size, when taken from the delivering card. Being carried through and delivered from the cards separately from each other, by means of the blocks V, shown in Figs. 3, and 9. The sliver, slubbing, or roving, is twisted while it is leaving, or being delivered from the finishing cards, preparatory to spinning. This twisting admits of the gathering the sliver without the use of the comb or doffer. The twist may be produced by the sliver or roving being passed through tubes as shown at 2, 2, Figs. 2, 3, and 7, or by being passed between pulleys, or bands, or other similar means. The sliver is condensed by means of the apparatus shown in Fig. 6, as a sub-

stitute for the twisting process. The unwinding the sliver from bobbins, or spools, on a mule or spinning machine, by means of a drum, is effected by giving the drum and spool a motion the reverse of that by which the winding was effected, as shown at M, L, Fig. 4.

I claim as new and my own invention, in the improvement before specified—

The combination of machinery, to produce the thread from wool, or other fibrous material, by performing the operation of twisting, winding, or taking away the same, while it is being delivered from the cards; feeding the cards, and unwinding the sliver, or roving for spinning, in the manner and modes, particularly described in the foregoing specification.

I do not claim the construction of the individual parts of the machinery used in the several processes before described, but the combination and arrangement, by which they are made to produce thread from wool, or other fibrous material, by a continued operation.

JOHN GOULDING.

Witnesses:
THOS. P. JONES,
JOS. O. ANDREWS.

[FIRST PRINTED 1914.]