

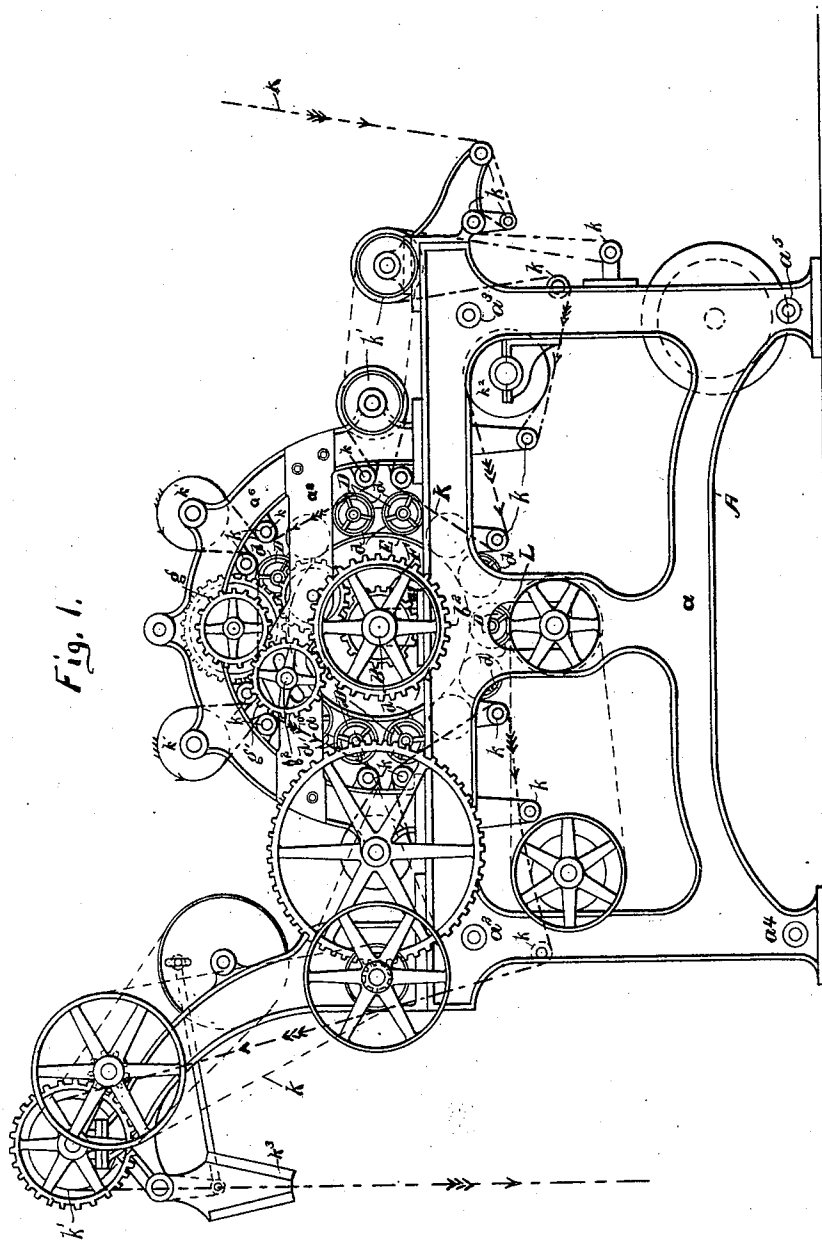
(No Model.)

3 Sheets—Sheet 1.

E. W. THOMAS.
CLOTH NAPPING MACHINE.

No. 478,143.

Patented July 5, 1892.



WITNESSES;
Elmer S. Childs.
Myrtie L. Beale.

INVENTOR;
Edward W. Thomas,
By Albert M. Moore,
His Attorney.

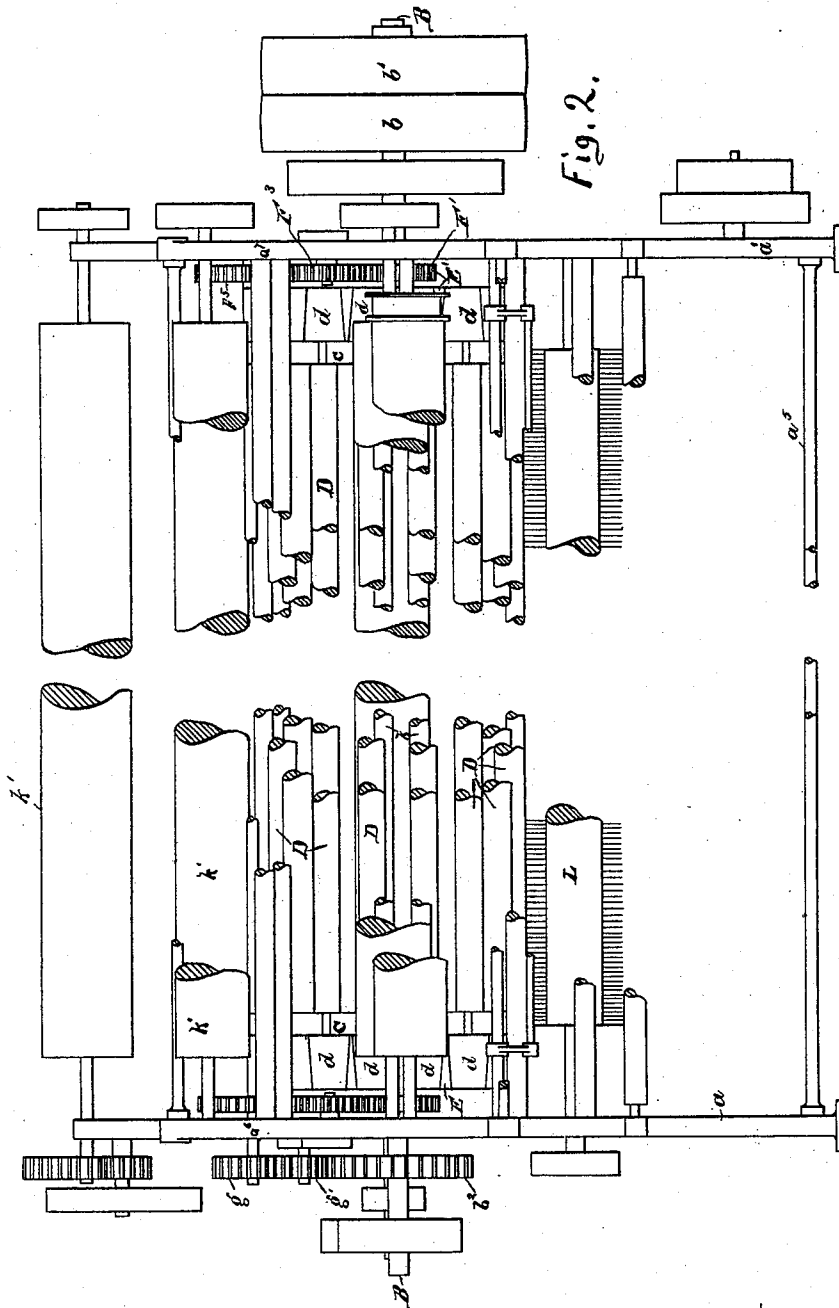
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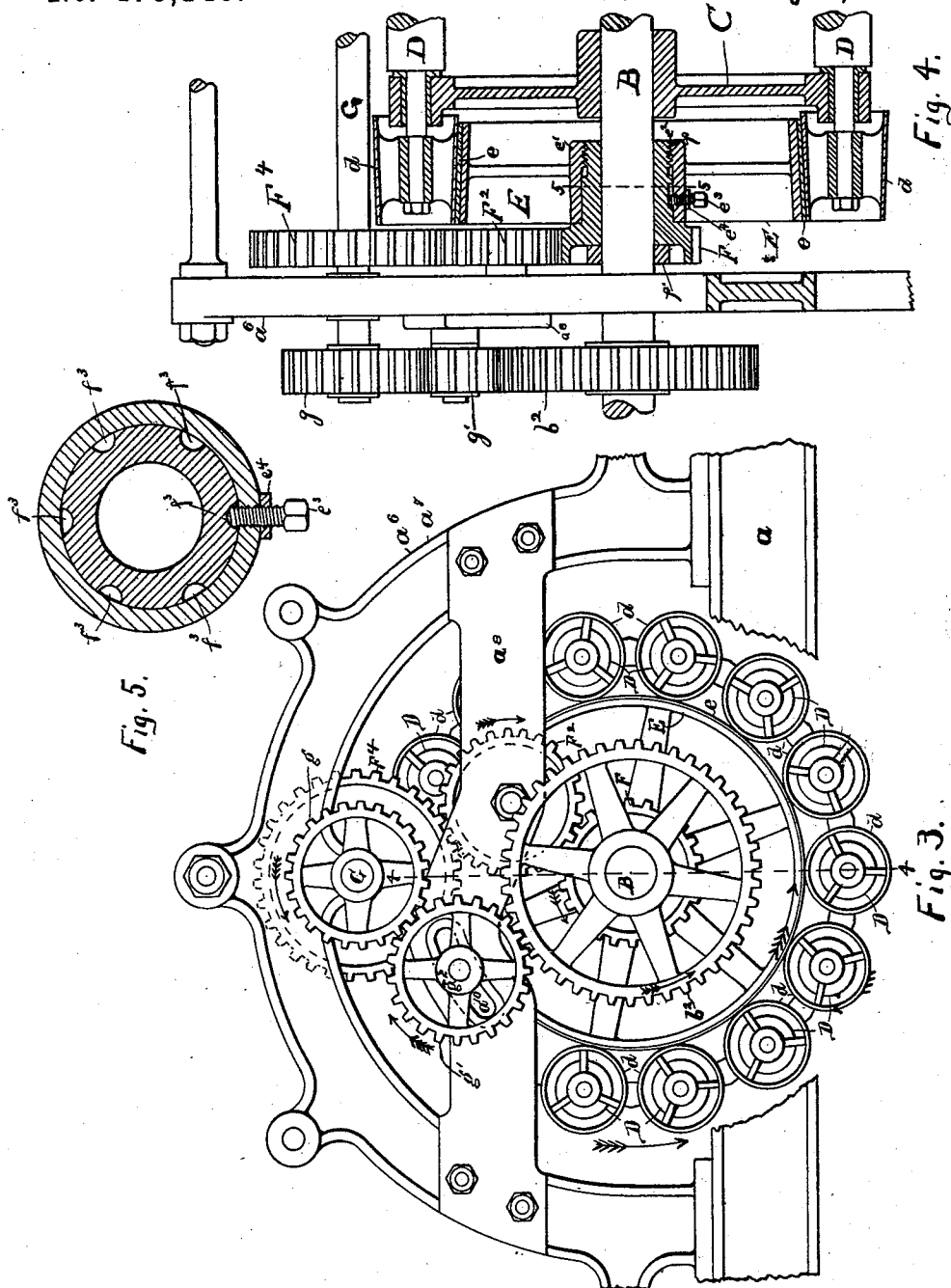
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UNITED STATES PATENT OFFICE.

EDWARD W. THOMAS, OF LOWELL, MASSACHUSETTS.

CLOTH-NAPPING MACHINE.

SPECIFICATION forming part of Letters Patent No. 478,143, dated July 5, 1892.

Application filed April 4, 1890. Serial No. 346,539. (No model.)

To all whom it may concern:

Be it known that I, EDWARD W. THOMAS, a citizen of the United States, residing at Lowell, in the county of Middlesex and Commonwealth of Massachusetts, have invented a certain new and useful Improvement in Cloth-Napping Machines, of which the following is a specification.

My invention relates to machines for napping cloth; and it consists in the devices and combinations hereinafter described and claimed, which have for their object to secure a greater surface of contact between the napping-rolls and the fabric being operated upon in order to accomplish more work in less time, to insure a uniform speed of the napping-rolls, and to economize floor-space.

In the accompanying drawings, on three sheets, Figure 1 is a side elevation of a machine for napping cloth constructed according to my invention; Fig. 2, a front elevation of the same, parts of all the revolving parts and of the cross-girts of the frame being broken; Fig. 3, an enlarged side elevation of part of the frame and arch and an end elevation of the cylinder, consisting of heads or spiders, and napping-rolls journaled therein and connecting-gears; Fig. 4, a vertical transverse section, on the line 4 4 of Fig. 3, of one of the heads or spiders of the cylinder, parts of two of the napping-rolls, the pulley which drives the napping-rolls, and a part of the frame, and a front elevation of parts of the gearing; Fig. 5, a vertical cross-section of the hub of the pulley which drives the napping-rolls and the hub of the gear to which said pulley is secured, showing grooves in said last-named hub, and a set-screw turning in the hub of said pulley and entering one of said grooves, this figure being an enlarged section on the line 5 5 in Fig. 4.

The frame A is of substantially the usual form, consisting of sides a' , connected by a sufficient number of cross-girts, as a^2 a^3 a^4 a^5 , and supports arches a^6 a^7 , the arch a^6 supporting a girt a^8 , said girt and arch forming, in effect, a part of the frame and, with the stands hereinafter named, supporting moving parts of the machine.

The main shaft B of the machine is journaled in stands a^9 , arranged at opposite sides of the machine upon the frame and is driven

in the usual manner by a belt (not shown) running on the pulley b , secured to said main shaft, the pulley b' being a corresponding loose pulley. To the main shaft B, within the frame, are secured heads or spiders C in which parallel with and at equal distances from said main shaft are journaled the teasing-rolls or napping-rolls D, said heads or spiders and napping-rolls constituting a napping-cylinder, each of said napping-rolls carrying two pulleys d , each fast on the shaft of said roll, said pulleys being arranged at opposite ends of said rolls in the usual manner. The pulleys d are frustums of cones, the largest diameters of said pulleys being nearest the spiders C, as shown in Fig. 4, and said pulleys d at one side of the machine are driven by frictional contact with the face of a conical pulley E, having an axis parallel with the axes of all the said pulleys and having its face parallel with the faces of each of said pulleys d at their respective lines of contact with said pulley E. The face of the pulley E is covered with any suitable material adapted to create considerable friction on the face of the pulleys d , as leather, rubber, cloth, or paper, as indicated at e in Fig. 4, and to drive said pulleys d by frictional contact therewith. The hub e' of the pulley E is provided with an internal screw-thread e^2 and engages an external screw-thread f on the hub of the gear F.

The gear F is loose on the main shaft B, but is prevented from outward longitudinal motion thereon by a collar f' , secured on said shaft, so that when the covering of the pulley E becomes worn it may be brought into better contact with the pulleys d by turning said pulley E on said gear F until a proper amount of pressure is secured, after which the pulley E is rigidly secured to the gear F by a screw e^3 , which turns radially in the hub e' and enters one of several longitudinal slots f^3 in the hub of said gear F, as shown in Fig. 5, and is prevented from accidental loosening by a check-nut e^4 , turning on said screw e^3 , against the hub of the pulley E. The gear F engages a gear F^2 , the latter engaging a gear F^4 , fast on the cross-shaft G, said cross-shaft carrying at its end outside of the frame another gear g , fast on said cross-shaft and engaging a gear g' , the latter engaging a gear b^2 , fast on the main shaft B. The pulleys d

at the other ends of the napping-rolls are driven by the rotation of a pulley E', like the pulley E and adjustable by similar means to take up the wear of its face on the hub of a gear F', (similar to the gear F and loose on the main shaft,) engaging a gear F³, which corresponds in position and function to the gear F² and engages a gear F⁵, similar to the gear F⁴ and like that fast on the cross-shaft

G. The proportionate number of teeth of the gears which connect the main shaft and the conical pulleys E E' is such that the pulleys E E' run at a greater surface speed than said main shaft, and the number of said gears is such as to give the napping-rolls a backward rotation, as usual, and as indicated by the arrows in Fig. 3. The relative speed of the napping-rolls and the main shaft may be varied and the speed of said rolls be increased or diminished by substituting for the gear *g* a gear having a less or greater number of teeth, and in order that this may be done the girt *a*⁸ (see Figs. 1, 3, and 4) is provided with a slot *a*¹⁰, concentric with the main shaft, and the intermediate gear *g'* is supported upon a stud *g*², adjustably secured in said slot in a well-known manner to enable said gear *g'* to be moved nearer to or farther from the cross-shaft, or, what is the same thing, nearer to or farther from the center of the gear *g*, without becoming disengaged from the gear *b*² on the main shaft. The amount of nap upon the cloth, or, in other words, the amount of the action of the napping-rolls, is determined by the speed of the napping-rolls.

The use of gears for determining the speed of the napping-rolls renders it possible to get a uniform and positive speed of the rolls, entirely dispensing with the use of belting or strapping.

The course of the cloth through the machine is indicated by the broken line K in Fig. 1, said cloth passing over guide rolls or rods *k*, carrier-rolls *k'*, a steam-filled heating-cylinder *k*², and being delivered by a folder *k*³, all of the usual construction and operation and forming no part of my invention. A clearing-roll L serves the usual purpose of clearing the napping-rolls in the usual manner.

The construction above described economizes floor-space by dispensing with the cone-pulleys usually arranged on the main shaft and the shaft which by means of a belt passing over all the pulleys of the napping-rolls drives said napping-rolls, said cone-pulleys projecting for a considerable distance from

the frame, and also enables the napping-rolls to be placed very closely together and gives a uniform speed to the napping-rolls, because the pulleys *d* are always in contact with the pulleys E E', thus practically increasing the napping-surface, whereas when the pulleys *d* are driven by a belt in the usual manner one or more of said pulleys *d* are always out of contact with the belt and running at a diminished speed.

I claim as my invention—

1. The combination of the napping-cylinder consisting of heads or spiders and napping-rolls journaled therein, said napping-rolls having tapering fast pulleys, a tapering driving-pulley concentric with said napping-cylinder and having its face in contact with the faces of said first-named tapering pulleys, the axes of said napping-cylinder and of all said pulleys being parallel with each other, and means of adjusting said driving-pulley in the line of its axis to increase the frictional contact between its face and the faces of said pulleys, as and for the purpose specified.

2. The combination of the napping-cylinder consisting of heads or spiders and napping-rolls journaled therein, said napping-rolls having tapering fast pulleys, a gear having an externally-screw-threaded hub and a tapering driving-pulley concentric with said napping-cylinder and having its face in contact with the faces of said first-named tapering pulleys and having an internally-screw-threaded hub to receive and engage the hub of said gear, as and for the purpose specified.

3. The combination of the napping-cylinder consisting of heads or spiders and napping-rolls journaled therein, said napping-rolls having tapering fast pulleys, a gear having a hub externally screw-threaded and provided with longitudinal slots, a tapering driving-pulley concentric with said napping-cylinder and having its face in contact with the faces of said first-named tapering pulleys and having an internally-screw-threaded hub to receive and engage the hub of said gear, and a screw turning in a hole with which said last-named hub is provided and entering one of said longitudinal slots in the hub of said gear, as and for the purpose specified.

In witness whereof I have signed this specification, in the presence of two attesting witnesses, this 3d day of March, A. D. 1890.

EDWARD W. THOMAS.

Witnesses:

ALBERT M. MOORE,
A. M. CHADWICK.