(No Model.) 2 Sheets—Sheet 1.

E. G. SPARKS.

MANUFACTURE OF WAXED PAPER.

No. 410,810. Patented Sept. 10, 1889.

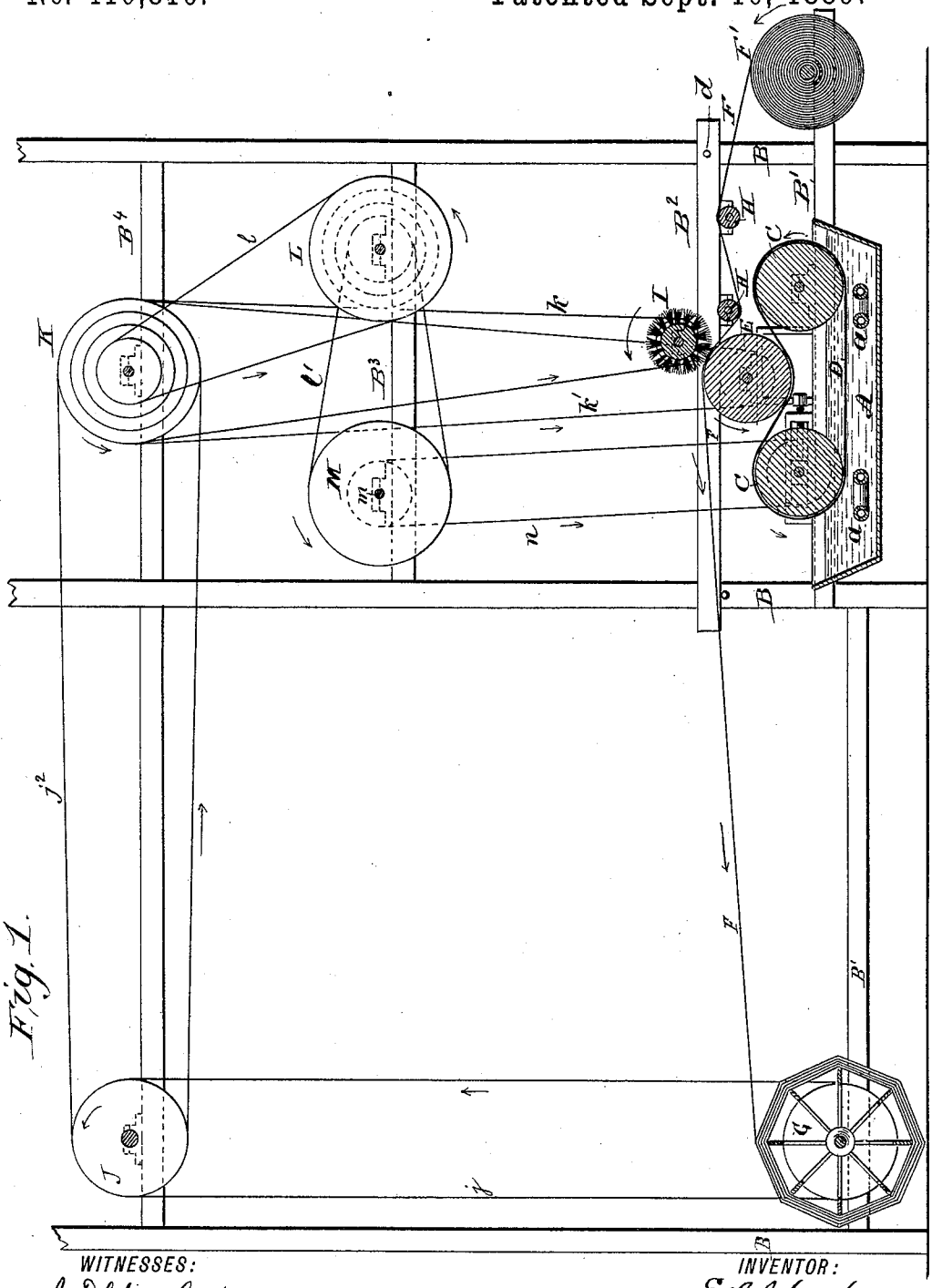


Fig. 1.

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(No Model.) 2 Sheets—Sheet 2.

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MANUFACTURE OF WAXED PAPER.

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Fig. 2.

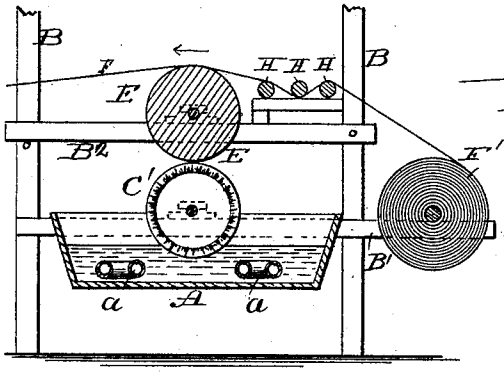


Fig. 3.

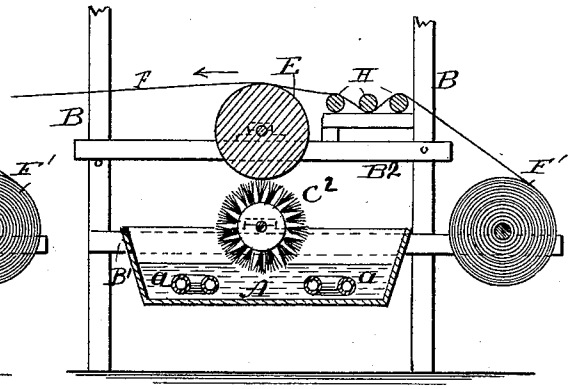


Fig. 4.

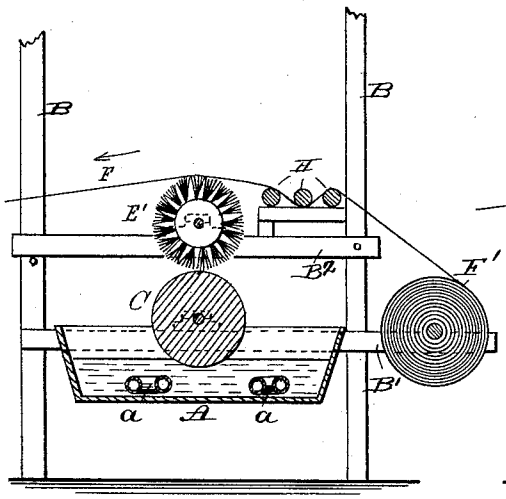
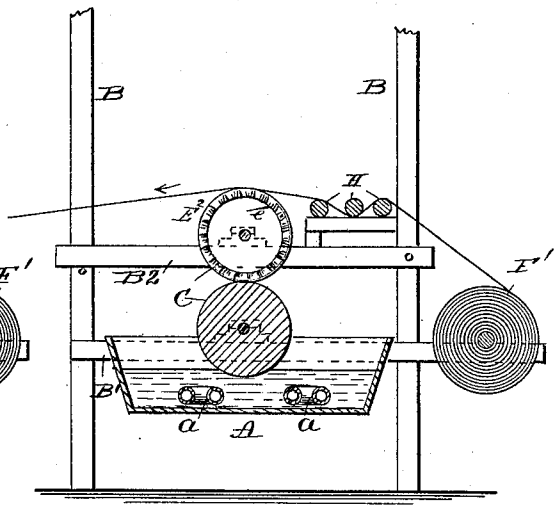


Fig. 5.



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UNITED STATES PATENT OFFICE.

EDWARD G. SPARKS, OF BROOKLYN, ASSIGNOR TO THE SPARKS MANUFACTURING COMPANY, OF NEW YORK, N. Y.

MANUFACTURE OF WAXED PAPER.

SPECIFICATION forming part of Letters Patent No. 410,810, dated September 10, 1889.

Application filed September 26, 1888. Serial No. 286,457. (No model.)

To all whom it may concern:

Be it known that I, EDWARD G. SPARKS, of Brooklyn, in the county of Kings and State of New York, have invented new and useful Improvements in the Manufacture of Waxed Paper, of which the following is a full, clear, and exact description.

This invention relates to the production of that class of paper with which is incorporated paraffine, or ceracine, or wax, or stearic acid, and known in trade as "waxed paper," the substance most commonly used for charging the paper being the purified paraffine of commerce. Wherever in this specification I use the term "wax" it will be understood that I refer to paraffine or any of the above substances.

My invention consists in a novel combination of mechanism for delivering the wax to the surface of the paper in a uniform manner and in novel means for regulating the quantity of wax delivered to the paper, as will be hereinafter fully described, and pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a sectional side elevation of one of my improved machines as arranged for operation; and Figs. 2, 3, 4, and 5 are side sectional elevations of portions of my invention, illustrative of certain modifications of some of the parts.

In the manufacture of waxed paper as heretofore conducted the wax is placed in a suitable tank and liquefied by heat, usually by steam-pipes that pass through the tank. Within the tank is placed a roller, the lower part of which dips into the hot wax and becomes covered therewith, the paper to be charged being drawn or fed in contact with the upper part of said roller, which stands above the level of the melted wax and delivers the hot wax to the surface of the paper, such delivery being always an excess of wax. The next operation is to remove from the paper a portion of this excess of wax, which is sought to be effected by feeding the paper against one or more heated rollers, in order to spread or force the wax into the pores of the paper, after which the paper passes against scrapers, by which a portion of the surplus or excess of wax is removed. The scraped paper now passes into contact with another heated roller to smooth and spread the wax. The various rollers and the paper all move at the same speed. These operations are attended with difficulties, and the waxed paper produced is uneven in quality and expensive to make, owing to the want of means to deliver the right quantity of paraffine or wax to the paper in the first instance, it being impossible by this method of working to do otherwise than deliver to the paper an excess of wax, and when the paper has been once charged in excess it is impossible to remove such excess of wax. The manufacturer is thus subjected to unavoidable losses of wax. Furthermore, the use of scrapers in the effort to remove wax requires that the paper shall be run slowly through the machine, and even then with the utmost care the paper is liable to become torn, thus entailing loss both of time and valuable materials.

In the practice of the above method it is difficult to make use of very thin or weak paper, as it is liable to be torn or broken in going through the machine and its various rollers and scrapers. Consequently a strong and comparatively expensive paper must be used, which again adds to the losses of the manufacturer, as he is thus compelled to use high-priced paper.

In my present invention, which I will now proceed to describe, all these difficulties are overcome and removed.

I have discovered that it is not necessary to saturate the pores of the paper with the wax, as heretofore practiced. I have ascertained that a better quality of waxed paper may be produced by avoiding this saturation, and instead thereof I apply a thin but uniform coating of the wax to the exterior surface of the paper.

One of the distinctive features or results of my invention is, that instead of filling the pores and charging the paper with an excess of wax in the first instance, and then removing or trying to remove such excess, as in the common method above described, I avoid the

application of all excess of wax or paraffine to the paper, and I am thereby enabled to throw out of my machine and altogether dispense with the use of all devices heretofore required for scraping or removing the excess or surplus of wax, together with the hot rollers and other devices used to spread or cause the wax to be absorbed in the pores of the paper. I thus cheapen the machine, and I am enabled to run the machine faster and finish the paper more quickly with saving of time. I also effect a great saving in the quantity of wax, and also an economy in the paper, as I am enabled to use with success the lightest grades of paper that may be demanded. In consequence of the simplification of my machines I am also enabled to run them at a much higher speed and with a less number of attendants than the ordinary machines, greatly increasing the amount of work done by each of my machines, and effecting important economies in the cost of producing the finished paper.

In carrying out my invention, and referring now to Fig. 1, I provide a tank A of the usual construction for containing the wax or other substance with which the paper is to be charged, and through which tank steam-pipes *a* are extended for heating the paraffine, said pipes communicating in any suitable manner with a steam-generator. The tank A is supported in a suitable frame having uprights B and cross-bars B′ B^2 B^3 B^4, on one of which B′ is suitably mounted a wax-take-up device, consisting, in this instance, of a pair of rollers C C, which carry a belt D of any suitable material, the lower part of which dips and moves in the wax, and becomes charged therewith.

Journaled on the bar B′ above the take-up device, and rotating in contact with the belt D thereof, I arrange a delivery-roller E, which moves in contact with the take-up device and becomes covered with wax. Said delivering-roller E delivers the wax it receives from the take-up device to the surface of the paper F, which passes in the direction of the arrow over and in contact with the upper surface of the delivering-roller E, as shown. Said delivering-roller E is speeded to run about five times or more faster than the paper moves. The paper F is drawn in the direction of the arrow from the roll of paper F′, which is suitably mounted for rotation on the bar B′, as shown. The paper on coming in contact with the delivering-roller not only receives the desired charge of paraffine, but is at the same time finished ready for use, and the paper goes onward in the direction of the arrows to the reel G, by the rotation of which the web of paper is drawn through the machine and wound up.

H H are loose guide-rolls journaled on the bar B^2 for directing the web of paper F as it comes from the roller F′ to the delivering-roller E.

In some cases—as, for example, when the web of paper F has been badly wound upon its roller F′, whereby it is creased or puckered or irregular—I have found it advantageous to arrange a smoothing device, which in this instance consists of a brush-roller I above the delivering device E at a point where the paper web reaches the delivering device, so that the brush I will press lightly upon the upper surface of the paper F and smooth out any wrinkles, creases, or puckers in the web of paper, and cause it to go smoothly into contact with the surface of the delivering device E, thereby insuring the perfect and even waxing of the surface of the paper. The brush-roller I is suitably journaled on the bar B^2. This bar is pivoted at one end at *d* to the upright B, for convenience in lifting to gain access to the parts below.

Motion is communicated to the several parts of the machine from a cone driving-pulley J of the ordinary mounting and construction. The reel G is operated by the belt *j* from the pulley J. Suitably mounted on the bar B^4 is a cone-pulley K, which receives motion from the pulley J by a belt j^2. A belt *k* from the pulley K gives rotation to the brush I. A belt *k*′ from the pulley K gives rotation to the delivering device E. Another belt *l* gives rotation to a cone-pulley L, which is suitably mounted and journaled on the bar B^3. A belt *l*′ from the pulley L gives rotation to the pulley M, which is mounted on the bar B^3, and a pulley *m* on the pulley M conveys motion by the belt *n* to one of the rollers C of the take-up device and its belt D. The several belts move in the directions indicated by the arrows.

The delivering-roller E has about five times faster velocity than that of the paper web. The delivering-roller E also has a velocity about four hundred and fifty times faster than that of the take-up device. The quantity of wax taken up by the latter and carried to the delivering-roller E is governed by the speed given to the take-up device; the faster it runs the more wax it will carry.

It will be observed that by means of the arrangement of belts and pulleys here described the motions or velocities given to the take-up device, the delivering-roller, the reel, and the brush may be increased or diminished at will by simply shifting their respective belts on their respective pulleys. Thus the speed of the take-up device, the delivering-roll, the reel, and the brush-roller may each be separately increased or diminished, as desired, independently of and without interfering with any other parts of the machine.

The above arrangement for independently controlling the speed of the take-up device I believe to be a new feature in paper-waxing mechanisms, and I find it to be of the greatest value and importance, for in connection with the delivering device it enables me to regulate exactly the quantity of wax that goes to the paper and avoids all losses caused by using an excess of wax.

I have described the take-up device as com-

posed of two rollers and a belt moving within the wax-tank, as shown in Fig. 1, and this form of take-up device I consider preferable; but in some cases I use the modified form shown in Fig. 2, in which the take-up device consists of a single cylinder or roller C′, its lower part turning very slowly in melted wax, which it takes up and carries to the delivering-roller E, as shown in Fig. 2. This take-up device C′ may consist of a plain roller, or the surface thereof may be covered with cloth or any other suitable absorbent or elastic material; or the take-up device may consist of a roller-brush C^2 of any suitable material, as shown in Fig. 3.

I have described the delivery-roller as consisting of a roller or cylinder moving in contact with the take-up device, and also in contact with the paper, as shown in Fig. 1. Instead of using a plain roller or cylinder, I find it desirable in some cases for working certain grades of waxed paper to make the delivering-roller in the form of a roller-brush, as shown at E′, Fig. 4. This brush may be composed of any suitable material. In other cases I use for the delivering-roller a roller covered with cloth or other suitable material, which may be absorbent and more or less elastic, as shown at E^2, Fig. 5, in which *e* represents the cloth or absorbent or elastic material.

The operation of my improved mechanism is substantially as follows: The web of paper F is extended from the roll through the machine and attached to the reel G, as shown in Fig. 1. Motion is then imparted to the driving-pulley J, from which all the other moving parts are put in operation through their respective pulleys and belts, as shown. The delivering-roller E rotates between the take-up device and the paper F. The lower surface of the delivering-roller, being in contact with the take-up device, receives wax from the latter and deposits its charge of wax against the surface of the paper, which moves in contact with the upper surface of the delivering-roller E. The delivering-roller E has a motion different from and independent of the other parts of the machine, being operated by its special or independent belt, as before described. The motion of the delivering-roller is much faster than the movement of the paper, and also much faster than the take-up device. The result of this peculiar motion of the delivering-roller is, that it receives a thin even coating or charge of wax from the take-up device, and delivers it upon the surface of the paper F in the form of a film of wax which is so even, smooth, uniform, and finished that no after treatment by scrapers or rollers is required. Thus the paper is finished at one operation and goes to the reel G, by which it is rolled up, and is then ready for market.

I do not limit or confine myself to the exact form and arrangement of parts herein described, as they may be varied to suit the requirements of the manufacturer without departing from my invention.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A mechanism for waxing paper, consisting of the following elements, operated in combination, as herein described, namely: a tank or holder for the wax, a take-up device moving in contact with the wax, a delivering-roller moving in contact with the take-up device, and means for imparting independent velocities respectively to the take-up device and to the delivering-roller, as set forth.

2. In machines for waxing paper, the combination, with the take-up device and the paper web, of a delivering-roll speeded to move at a higher velocity than the paper web, as herein set forth.

3. In machines for waxing paper, the combination, with the take-up device and the paper web, of a delivering-roll arranged to move in contact with both the take-up device and the paper web at a higher velocity than either of them, as and for the purposes set forth.

4. In machines for waxing paper, the combination of the following instrumentalities, operated as described, namely: a take-up device and means for independently driving the same, a delivering-roll and means for independently driving the same, and a winding-reel and means for independently driving the same, as herein set forth.

EDWARD G. SPARKS.

Witnesses:
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E. M. CLARK.