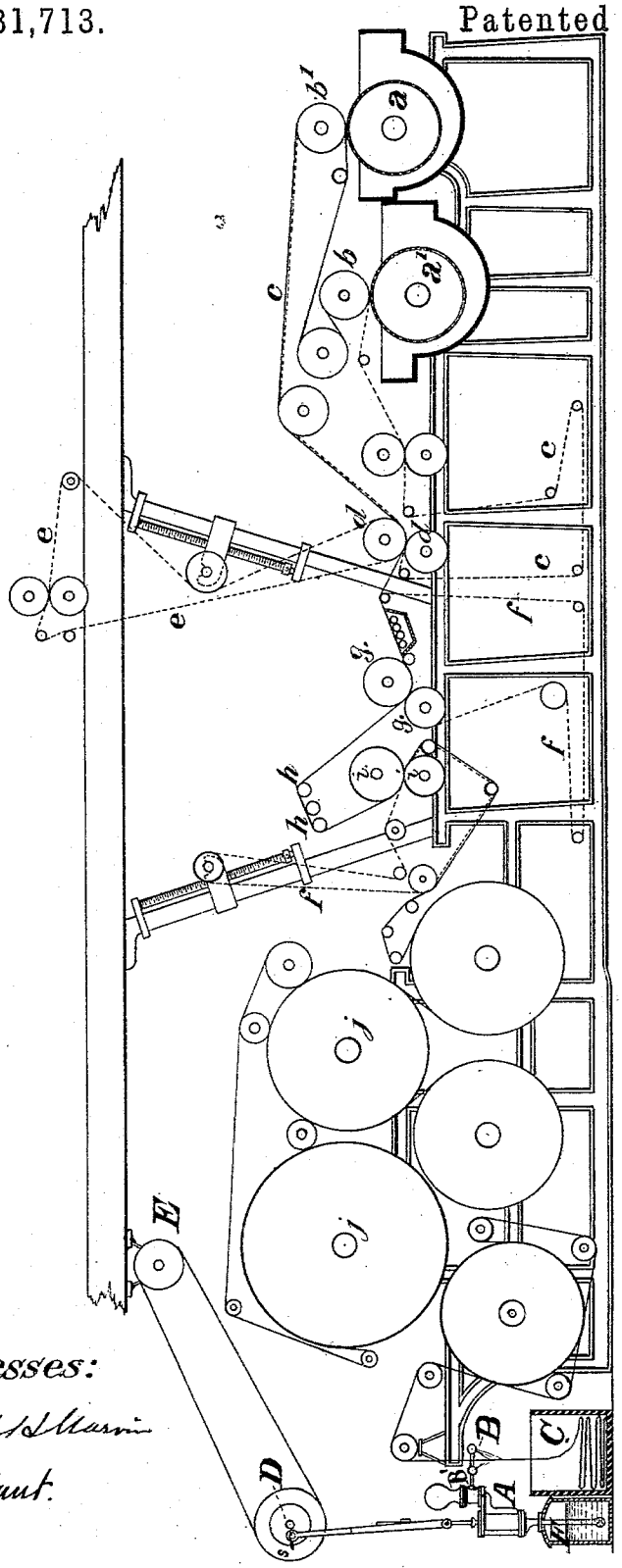
(No Model.)

J. W. HYATT.

COMPOUNDING PYROXYLINE WITH ITS SOLVENTS IN THE MANUFACTURE OF SOLID COMPOUNDS.

No. 331,713. Patented Dec. 1, 1885.



Witnesses:
Inesfield Marin
Thomas Hunt.

Inventor:
John W. Hyatt
J. Lindon Hyde
atty

N. PETERS, Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

JOHN W. HYATT, OF NEWARK, NEW JERSEY.

COMPOUNDING PYROXYLINE WITH ITS SOLVENTS IN THE MANUFACTURE OF SOLID COMPOUNDS.

SPECIFICATION forming part of Letters Patent No. 331,713, dated December 1, 1885.

Application filed May 14, 1885. Serial No. 165,479. (No model.)

To all whom it may concern:

Be it known that I, JOHN W. HYATT, of the city of Newark, county of Essex, State of New Jersey, have invented certain Improvements in the Process of Combining Pyroxyline with its Solvents in the Manufacture of Solid Compounds, of which the following is a specification.

In making pyroxyline compounds it is very difficult to combine the pyroxyline with active solvents, unless the proportions of such solvents are largely in excess of the amount of pyroxyline used. The reason for this is that the pyroxyline absorbs the solvent so readily that whenever the two come together the greater portion of the solvent is taken up at the first point touched. In a mass of pyroxyline any part which comes into contact with the solvent will first absorb several times its own weight before it permits any of the liquid to seek other parts of the mass. As it is not only unnecessary, but positively objectionable, to use so large a proportion of solvent as the pyroxyline naturally absorbs, the importance of methods by means of which the proportions can be regulated at will has long been recognized by those skilled in this art.

Although it is impossible, under ordinary conditions, to penetrate a large mass of dry pyroxyline with a small quantity of active solvent, still it has been found that the pyroxyline possesses the power, to a very limited extent, of absorbing the solvent from those portions of the mass already saturated. I propose to make use of this limited penetrative power of active solvents in the following process: I first cut the pyroxyline, while in a dampened condition, into a flock, preferring to use for this purpose the machine described in my patent of September 6, 1881, and numbered 246,678. I have found that pulp made in this manner is more suitable for making pyroxyline paper than that ground in an ordinary paper-engine. In order to grind the pyroxyline in this machine, it must contain no more moisture than is necessary to render it non-inflammable—say from six to eight parts of water to each ten parts of pyroxyline. After the pulp is formed, I mix it with water and make it into paper.

The drawing represents a cylinder paper-making machine for making paper from pyroxyline pulp and sprinkling the same with spirits of camphor or other solvent after it has passed over the drying cylinders. *a a'* are the two making-cylinders; *b b'*, the couching-rolls. From these the paper is taken by the endless felt *c* to the first press-rolls, *d d*, where it is slightly pressed between the felt *c* and another felt, *e*, which revolves around the upper press-roll. The paper is then detached from the first felt and led upon another endless felt, *f*, which conducts it to the second press-rolls, *g g*, where it is further slightly compressed, and, after passing over the guide-rolls *h h*, is carried to the third set of rolls, *i i*, where a greater pressure is imparted, and thence to the steam-heated cylinders J J, where it is dried. Two finely-perforated tubes, B B', are arranged so as to sprinkle spirits of camphor upon both sides of the paper as it passes from the drying-cylinders and into a suitable box, C. The pump A supplies the solvent in measured quantities from the tank F, and is driven by means of the crank-shaft D, operated by a belt from the pulley E, which is revolved by power. The crank-disk is provided with a slot, S, for moving the crank-pin from or toward the center of the shaft to increase or decrease the stroke of the pump, and thereby regulate the quantity of solvent to be supplied to the sprinkler. This process requires that the sheets made from the pyroxyline pulp be of a thickness proportioned to the amount of liquid solvent to be applied to the same. I recommend a uniform thickness to gage of about one thirty-second of an inch. When the sheets are much thicker than this, they refuse to absorb the solvent, and when they are made too thin they absorb it too readily, some parts taking more than the necessary supply. The supply of solvent is so regulated that only the proportion necessary to convert the pyroxyline is added. Experience has shown that a mixture, by weight, of one hundred parts pyroxyline, forty parts of alcohol, and forty parts of camphor is sufficient to accomplish this result. These proportions can be varied at will, according to the necessities of the case, as is well understood by those familiar with this art.

When the box C has received enough of the saturated paper for a batch, it is removed and another box substituted for it. After removing the box, it is closed to prevent evaporation of the solvent, and permitted to rest from one to two days, or until the mass of pyroxyline has been thoroughly penetrated by the solvent, after which it is converted into a homogeneous compound in masticating-rolls, or by heat and pressure otherwise applied, as is well understood. It is obvious that this is not the only means of carrying out the present invention. It is not necessary that the pyroxyline paper be made into a continuous sheet, or that the operation be confined to an ordinary paper-making machine. A sheet formed from the pyroxyline pulp by any means will answer the purpose, it merely being necessary that it be of the proper thickness. Even when made in small sheets, it would still be possible to sprinkle the proper amount of solvent upon them, and afterward carry out the remainder of the process as already described; but the method I have described and which involves the use of a paper-making machine is more accurate, and for large quantities more economical, and will be found to perform the required operation in a satisfactory manner.

I do not limit myself to sprinkling the solvent upon the pyroxyline, because by properly regulating the conditions—such as the thickness of the paper and the duration of the contact—it is possible to apply the requisite quantity by dipping the pyroxyline into the solvent. Thus it will be seen that the essence of the invention is the forming of the pyroxyline into the necessary shape for the reception and absorption of the solvent.

What I claim is—

1. The process of making pyroxyline compounds in the following steps: first, grinding pyroxyline in pulp or flock; second, forming the pulp or flock into a thin sheet or sheets; third, applying a suitable solvent to the sheet by sprinkling or equivalent means; fourth, completing the material in masticating-rolls or by the use of heat and pressure, substantially as described.

2. The process of manufacturing pyroxyline compounds, consisting of the following steps: first, forming films or sheets from pyroxyline flock or pulp; second, saturating the sheets with the requisite quantity of solvent; third, massing the sheets together in a closed receptacle; fourth, completing the material by means of masticating rolls or heat and pressure, substantially as described.

3. The process of manufacturing pyroxyline compounds by first forming thin sheets from pyroxyline flock or pulp and then saturating such sheets with the requisite quantity of liquid solvent, substantially as described.

4. The process of manufacturing pyroxyline compounds, consisting of the following steps: first, forming a pulp or flock of pyroxyline by means of revolving knives in a drum; second, forming a paper from the pulp by means of a paper-making machine; third, saturating the pyroxyline-paper with liquid solvents; fourth, massing the saturated paper together and permitting it to rest for a definite time until the solvents are absorbed; fifth, completing the conversion by means of masticating-rolls or heat and pressure, substantially as described.

JOHN W. HYATT.

Witnesses:

ABRAHAM MANNERS,

NEIL CAMPBELL.