

(No Model.)

J. W. HYATT.

METHOD OF COMBINING PYROXYLINE AND ITS SOLVENTS IN THE
MANUFACTURE OF SOLID COMPOUNDS.

No. 331,242.

Patented Nov. 24, 1885.

Fig. 1

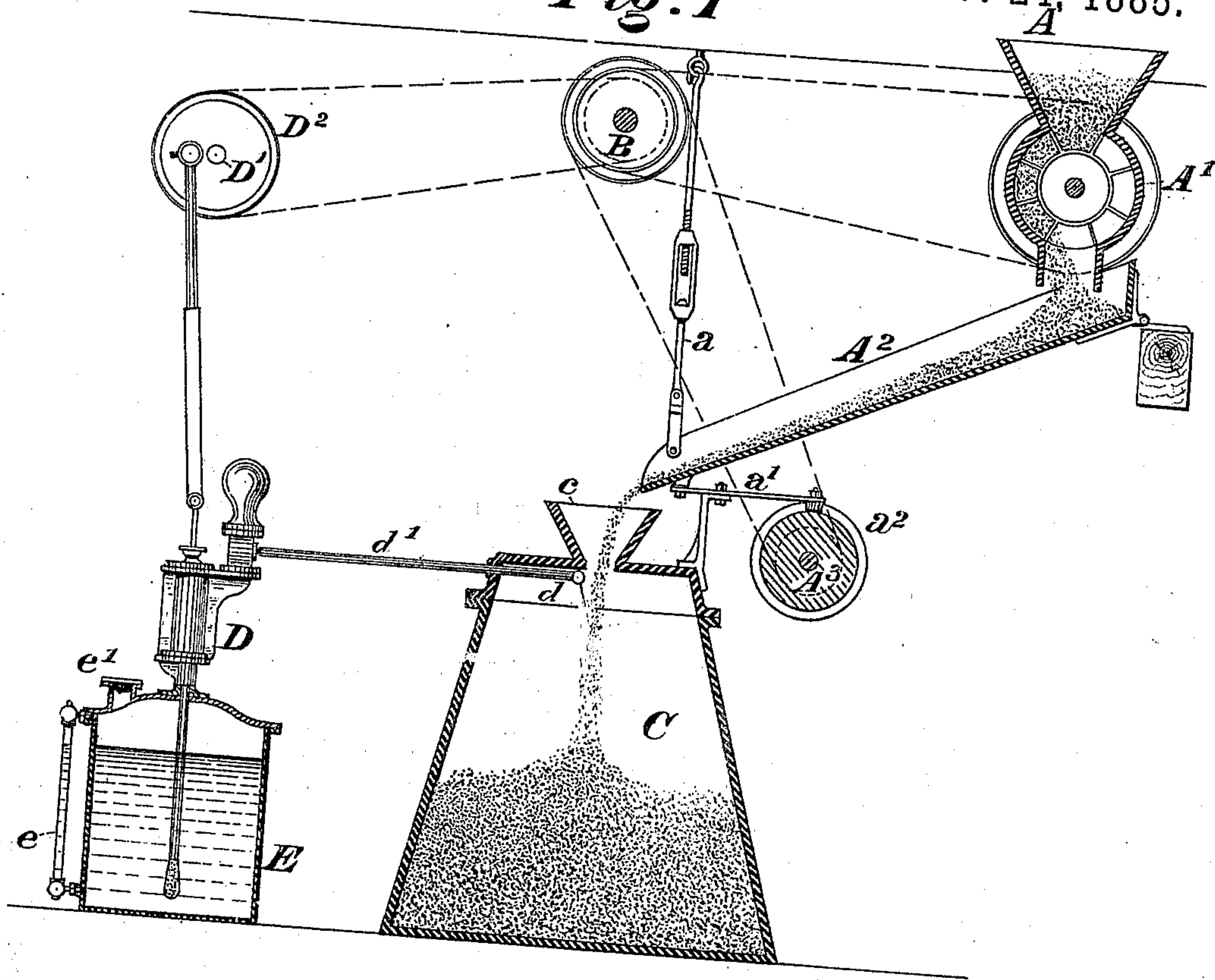
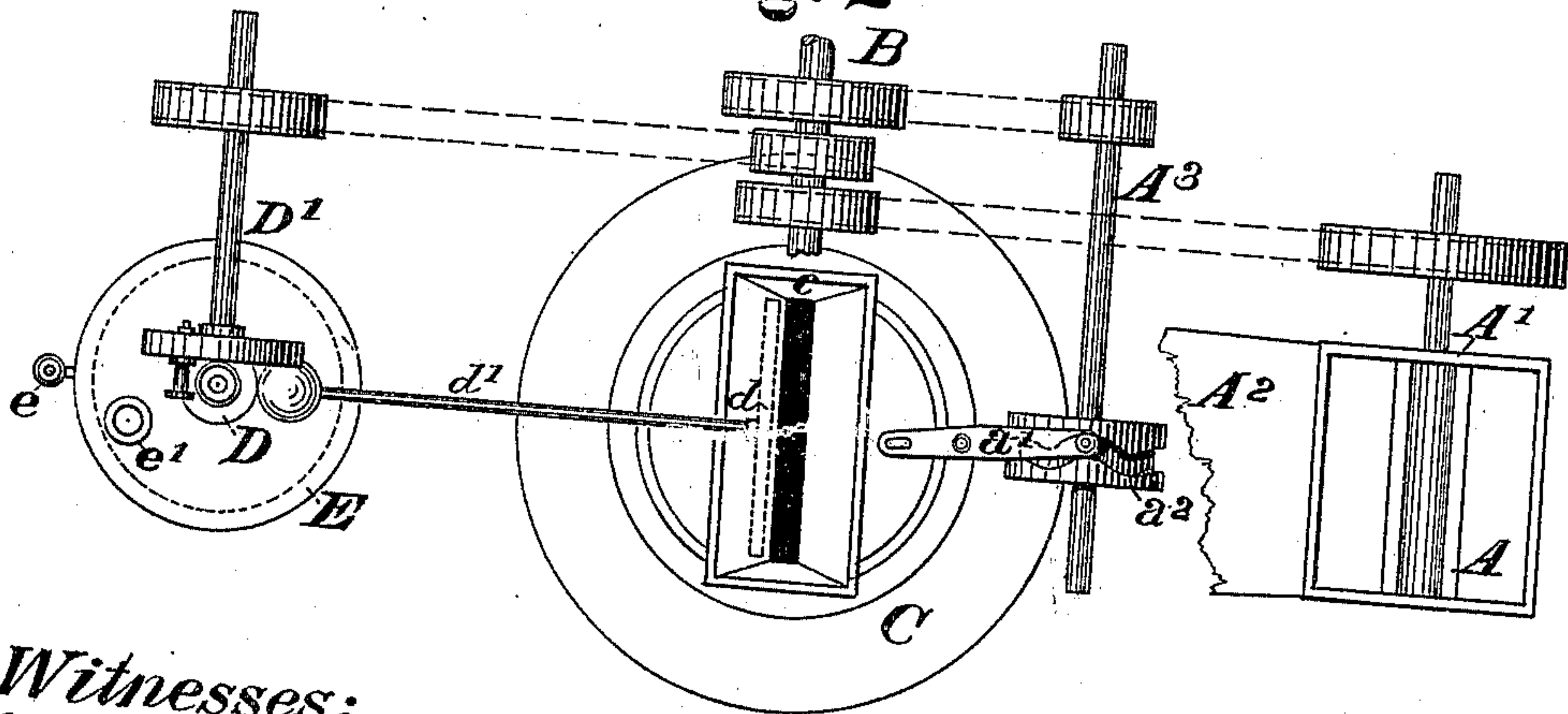


Fig. 2



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JOHN W. HYATT, OF NEWARK, NEW JERSEY.

METHOD OF COMBINING PYROXYLINE AND ITS SOLVENTS. IN THE MANUFACTURE OF SOLID COMPOUNDS.

SPECIFICATION forming part of Letters Patent No. 331,242, dated November 24, 1885.

Application filed May 14, 1885. Serial No. 165,480. (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
5 in the New Method for Combining Pyroxyline and its Solvents in the Manufacture of Solid Compounds, of which the following is a specification.

In the manufacture of pyroxyline compounds
10 it is of course desirable to use as small a proportion of solvent as possible, as the liquid solvents are generally volatilized and lost. It has heretofore been very difficult to mix pyroxyline with the desired proportion of solvent,
15 because the strong affinity of the pyroxyline for the solvent demands special methods for combining the two together. Experience has demonstrated that when a solvent composed of, say, equal parts, by weight, of
20 alcohol and camphor is used about eighty parts of it are sufficient to transform one hundred parts of pyroxyline, (under the influence of heat and pressure.) To accurately mix so small a proportion of solvent with the pyroxy-
25 line requires a special method—such, for instance, as described in my patent of October 27, 1874, and numbered 156,353. If an attempt is made to combine so small a portion of solvent by prior methods of mixing—to wit, form-
30 ing a liquid solvent of the camphor dissolved in alcohol—and applying it or any similar or other actual liquid solvent, those portions of the pyroxyline which are first brought into contact with the solvent will absorb it in such
35 quantities as to take more than their proportion, while the other parts will be left untouched; and such is the tendency of the dry portions to remain in that condition that any practical amount of subsequent mixing will
40 not correct the want of uniformity in the mass. While this is true, yet it is also true that in process of time, if the mass is allowed to stand, the solvent will partially leave those portions with which it first comes into contact and be
45 absorbed in a limited way by some of the dry pyroxyline in its immediate neighborhood. I propose to take advantage of this limited spreading of the solvent throughout the mass to effect a good mixture by successfully bring-
50 ing the pyroxyline and solvent together in small portions, and in such a manner that,

although each particle of the fiber may not at first be acted upon by its proper quantity of liquid, still the combination will be close
55 enough to permit of the complete substantially-uniform absorption of the solvent when the mixture is allowed to rest. To effect this result I proceed as follows: I first grind the pyroxyline to a pulp in an ordinary pulping-machine, such as is used in the manufacture
60 of paper. The pulp thus formed is next dried by suitable means, after which it will be in a finely-powdered condition, said powdered condition being an important feature of the process. The dry pulp is conveyed to an appa-
65 ratus, which will be hereinafter more fully described, for the purpose of introducing the requisite quantity of liquid solvent. In this process I contemplate using a solution of camphor in alcohol or wood-spirits; but I
70 do not limit myself to the nature of the solvent employed, merely requiring that it shall be a useful solvent of pyroxyline. By means of said apparatus I am enabled to spray the solvent against a moving stream of the py-
75 roxyline pulp, and the supply of pulp and liquid can be so regulated that they can be mingled in any desired proportions. The mixture of pulp and solvent is received in a box, which, when full, is removed from the machine, closed to pre-
80 vent evaporation of the solvent, and allowed to rest for from one to two days, or until the solvent is uniformly diffused throughout the mass, after which the materials are masticated in heated rolls in the ordinary way, and the
85 transformation of the materials into a solid homogeneous compound is then completed in suitable machinery, where heat and pressure can be applied, as referred to in my patent of October 27, 1874.

Another means of practicing the invention
90 is as follows: I first form a very thin layer of powdered pyroxyline by any well-known mechanical means—such as by passing the pyroxyline pulp through a sieve. I next add the
95 solvent by spraying it over the surface of the layer of pyroxyline by means of any suitable spraying or sprinkling device. This operation I repeat until I have a mass composed of a very thin layer of pyroxyline pulp and sol-
100 vent. I allow the mass to rest in a closed vessel until thoroughly penetrated by the solv-

ent, when it is ready for mastication in the rolls, and other subsequent treatment, as already described; but the use of the apparatus described in the drawings will be found preferable, especially when large quantities of material are manufactured. For smaller lots the process just described, involving the building up of thin layers, will be found useful.

I do not desire to limit myself to the apparatus herein described; but what I claim, and desire to secure by Letters Patent, is a process that involves the bringing together of the pyroxyline and solvent in certain definite proportions by the mechanical means and under the conditions substantially as described.

In the accompanying drawings, Figure 1 is a sectional elevation, and Fig. 2 a plan or top view, of a machine for carrying out my improvements.

A is a hopper by which the dry pyroxyline pulp is delivered through a meter or measuring-machine, A', to a chute, A². This chute is hinged at its upper end, and suspended by a rod, a, or other suitable means, at its lower end, so that this end may be raised or lowered to regulate the quantity of the pulp passing over it. In order to keep up a steady and uniform movement of the pulp, a slight but quick reciprocating movement may be imparted to the chute by means of the lever a' and the grooved cam a². The cam a² is mounted upon a shaft, A³, which receives motion from the main shaft B, from which the meter A' is also driven by belt and suitable pulleys; but the reciprocating movement is a desirable and essential requisite. From the chute A² the pyroxyline pulp passes through a meter, provided with the hopper c, into a receptacle or can, C. Immediately below the inlet of the can a sprinkler, d, is attached, which consists in a tube provided lengthwise with a number of fine perforations pointing downward in the direction of the falling pulp. This sprinkler is supplied with spirits of camphor from a can or tank, E, through the pump D and its delivery-pipe d'. The can E, which contains the spirits of camphor, has an opening, e', for the admission of the solvent, and a gage or graduated glass tube, e, for measuring the contents. The suction-pipe of the pump is provided with a strainer to prevent any foreign matter from passing through the pump to the sprinkler.

The pump D is worked by a crank-shaft, D'', which receives motion from the main shaft

B. The crank-disk D² is provided with a slot, so that the crank-pin may be moved from or toward the center of the shaft, for lengthening or shortening the stroke of the pump-piston, and thereby to increase or decrease the quantity of spirits of camphor delivered to the sprinkler. It will also be understood that, as the pump is driven, primarily, by the main shaft B, and the meter A, which regulates the quantity of pyroxyline pulp to be conveyed to the can C, is also driven by the same shaft, in other words, that their motion is coincident, the quantity of spirits of camphor supplied to the sprinkler must be at all times proportionate to the quantity of pyroxyline with which it is brought in contact.

What I claim is—

1. In the manufacture of solid compounds, combining pyroxyline with solvents of the same by spraying the solvents against a moving stream of pyroxyline pulp, substantially as described.

2. The process of manufacturing solid pyroxyline compounds, consisting of the following steps: first, grinding the pyroxyline to a pulp; second, bringing the pulp while moving, and little by little, into contact with a liquid solvent; third, allowing the mass to rest in a closed receptacle until the liquid solvent is diffused; fourth, masticating the resultant mass on rollers, substantially as and for the purpose described.

3. The apparatus consisting of the combination-chute A² and receptacle C and sprinkler d, by means of which pyroxyline pulp is mixed little by little with spirits of camphor or its equivalent, for the purposes mentioned, and substantially as described.

4. The apparatus consisting of the combination of reciprocating chute A², hopper c, receptacle C, and sprinkler d, so arranged that spirits of camphor or its equivalent in the condition of a fine spray can be mingled with particles of pyroxyline, for the purposes mentioned, and substantially as described.

5. The apparatus consisting of the combination of the measuring device A', or its equivalent, chute A², (stationary or reciprocating,) hopper c, receptacle C, and sprinkler, d, arranged, substantially as described, to combine pyroxyline with a liquid solvent in definite proportions, substantially as specified.

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Witnesses:

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