CELLULOID MANUF'G CO. *v.* CELLONITE MANUF'G CO.

Circuit Court, S. D. New York. June 26, 1890.

PATENTS FOR INVENTIONS—EXTENT OF CLAIM.

Letters patent No. 156,852, issued October 27, 1874, to John W. and Smith Hyatt for an improvement in manufacturing solidified collodion "by mixing pyroxyline with a latent liquid solvent, which becomes active only upon the application of heat," do not cover liquid solvents which are active as respects the pyroxyline with which they are brought into actual contact, but are used with such a relatively large mass of pyroxyline that the mass will not be converted into solidified collodion at ordinary temperatures.

In Equity.

J. E. Hindon Hyde, for complainant. *John R. Bennett,* for defendant.

LACOMBE, J. This is a suit for infringement of the first claim of letters patent No. 156,352, dated October 27, 1874, and issued to Smith Hyatt and John W. Hyatt for an "improvement in manufacturing solidified collodion." The claim referred to is as follows: "(1) The process herein described of manufacturing solidified collodion by mixing pyroxyline with a latent liquid solvent, which becomes active only upon the application of heat, as and for the purposes set forth." Upon the construction of this claim rests the determination of the case. The complainant insists that it covers liquid solvents which are active as respects the pyroxyline with which they are brought into actual contact, but are used with such a relatively large mass of pyroxyline that the mass will not be converted into solidified collodion at ordinary temperatures. The defendants contend that the claim must be restricted to such liquid solvents only as possess no solvent powers at ordinary temperatures, and which, when brought in contact with pyroxyline, remain perfectly inactive till the application of heat; heat alone being necessary to bring into activity their latent solvent powers.

The first question, then, to be decided is whether, under this patent, the activity or latency of a solvent is to be determined with reference solely to the power of the solvent itself, or with reference to the quantity of pyroxyline to which it is applied. Another patent for an improvement in the manufacture of celluloid (No. 156,353) was taken out by the Hyatts on the same day as the one in suit. That patent was before Judge SHIPMAN, in *Celluloid Manuf'g Co.* v. *American Zylonite Co.,* 26 Fed. Rep. 692. In his decision will be found a very full description of the state of the art prior to October 27, 1874, and to restate it here would be mere useless repetition. The following brief narrative of events, however, bears more particularly upon the point raised in this suit: In June, 1869, (No. 91,341,) the Hyatts patented an "improved method of making solid collodion," the distinguishing feature of which was the use of great pressure applied to a mixture of pyroxyline and solvent, and applied so quickly that the solvent was forced into contact with every particle of the pyroxyline before the dissolving process had time

to commence. By that method a relatively small quantity of the solvent was required, the proportions of solvent to pyroxyline being given as 5 to 10, 7 to 10, or equal parts by weight. Theretofore the solvent was used in proportions greatly exceeding the pyroxyline, and the Hyatts correctly describe the process of this patent of June, 1869, as one which consists in "using the smallest practicable proportion of a liquid solvent." The only solvents contemplated in that patent were manifestly active ones, which, even in the proportions stated, dissolved those parts of the pyroxyline with which they came in contact, but were inoperative to transform the mass, unless a prompt dispersion of their activity by means of the plunger secured uniformity of action. Presumably the action of the plunger generated heat, but as to that the patent (91,341) is silent. Shortly afterwards, having ascertained the new and important fact that camphor gum, which is not a solvent of pyroxyline when cold, becomes such when heated, the Hyatts took out patent No. 105,338, July 12, 1870. In that document they described their invention to be the mixing with pyroxyline, prepared with powdered pigments, "any substance in a powdered state which may be vaporized or liquified and converted into a solvent of pyroxyline by the application of heat, and subjecting the compound so made to heavy pressure while heated, so that the least practicable proportion of solvent may be used in the production of solid collodion and its compounds." The process described is as follows: Pyroxyline is reduced to a pulp, and any desired pigments added. While the ground pulp is still wet, there is mixed therewith finely pulverized gum-camphor, in about the proportions of one part, by weight, of the camphor to two parts of the pyroxyline when in a dry state. These proportions may be somewhat varied with good results. After a thorough mixing, the water is expelled as far as possible by straining the mixture, and subjecting it to immense pressure in a perforated vessel. The mixture is then subjected to heavy pressure in a mould, and heated from 150 deg. to 300 deg. F., to suit the proportion of camphor and the size of the mass. The heat, according to the degree used, vaporizes or liquifies the camphor, and thus converts it into a solvent of the pyroxyline. By introducing the solvent in the manner described, and using heat to make the solvent active, and pressure to force it into intimate contact with every particle of the pyroxyline, there may be used a less proportion of this, or any solvent which depends upon heat for its activity, than had ever been known before. This patent of July, 1870, contained the following disclaimer: "We are aware that camphor made into a solution with alcohol or other solvents has been used in a liquid state as a solvent of xyloidine, [pyroxyline.] Such use of camphor as a solvent of pyroxyline we disclaim." Under this patent they claimed the grinding of pyroxyline into a pulp, the use of pressure, as described, and "(2) the use of finely comminuted camphor-gum, mixed with pyroxyline pulp, and rendered a solvent by the application of heat, substantially as described." In June, 1874, the Hyatts secured a reissue of their 1870 patent, known as "Reissue No. 5,928." A more specific account of their discovery as to the action of dry camphor is

contained therein. "Our invention," says the specification, "is based upon our discovery of the fact that gum-camphor in a powdered or finely comminuted state remains, under ordinary temperatures, inert when mechanically mixed with pyroxyline, of which, in solution or in a liquid state, it is, under ordinary temperatures, an active solvent; and of the further fact that, when such a mixture is subjected to heat above the ordinary temperatures, the camphor becomes an active converting agent, and transforms the pyroxyline into collodion as effectively as had been done with solutions. And these discoveries enable us to substitute a mechanical mixture for the solutions heretofore employed to keep the converting power latent, or hold it in abeyance until its action can be developed, under the best conditions and with the best effect, instead of having to contend with the difficulties incident to the premature and partial action of solutions, immediately upon coming in contact with the pyroxyline, and, while ultimately utilizing all the converting power of the camphor, to avoid the expense and loss of solvents, such as ether and alcohol, which were driven off or volatilized in the process of transformation. Other latent converting agents may be used in a similar way to effect a similar result." The invention, they add, consists in the preparation and mechanical mixture of pyroxyline and "a latent converting agent, * * * which remains inert until the compound is subjected to a treatment which develops its converting power, * * * thereby transforming the pyroxyline into solidified collodion without the intervention of solutions or volatile solvents."

In this reissue they omitted the words "in a powdered state," struck out their disclaimer of camphor made into a solution with alcohol, and added a new claim, viz.:

"(3) The method, substantially as herein described, of making solid collodion by subjecting a mixture of pyroxyline and a latent solvent to heat and pressure."

They also amended the claim to the use of gum-camphor as follows

"(1) The combination of pyroxyline with camphor-gum, or any equivalent converting agent, in such manner that the transforming action of the converting agent is kept latent, substantially as and for the purposes set forth. (2) The method, substantially as herein described, of developing the latent power of the converting agent by the application of heat to a mixture of pyroxyline and gum-camphor, or its equivalent, for the purposes set forth."

In this reissue the word "latent" is for the first time introduced into the art, although a deferred action of the solvent was quite clearly indicated in the patent of 1870, as originally issued.

Among the numerous exhibits which have been presented, covering so many different varieties of compound, there is none showing the mixture of this reissue, viz., one part by weight of powdered camphor, and two parts by weight of pyroxyline. No doubt, in view of the evidence, such an exhibit was deemed unnecessary. The powdered camphor in that mixture is truly and strictly a latent solvent. One of the complainant's experts (Prof.

Chandler) suggested that delicate experiments might show that there was some occult action between the components; but he admits

that practically and apparently the camphor is entirely without action upon the pyroxyline until the temperature is raised in some way, or some third substance is introduced. Until that time it remains perfectly inactive and inert. It does not even commence the transformation of pyroxyline by exerting its inherent activity over those portions with which it is brought into immediate contact. Thorough mixture no doubt spoils the pyroxyline pulp commercially as pyroxyline, and spoils the camphor commercially as camphor. Thereafter it may be impossible to separate the components; but apparently and substantially the solvent action which breaks down the fibrous constitution of the pyroxyline, and produces the yellowish, semi-transparent, glutinous compound which presents itself in so many of the exhibits introduced by both sides, does not take place till heat in some form is applied.

In September, 1874, the Hyatts made application for the patent here sued upon, for "improvement in manufacturing solidified collodion," No. 156,352, dated October 27, 1874. In the specification they stated that the object of their invention was to overcome certain objections involved in the use of liquid solvents. The objections and remedies are thus pointed out:

"Heretofore liquid solvents have been used in dissolving pyroxyline by first preparing the solvent, {for instance, ether and alcohol, nitro-benzol, etc.,} and then saturating the pyroxyline with the solvents. When the pyroxyline and such solvents are brought into contact, the transforming action of the solvent upon the pyroxyline commences at once, so that the portions of the pyroxyline first exposed to the action of the solvent become first dissolved, and absorb an excess of the solvent during the mixing processes, and before the conversion of the entire mass of pyroxyline has taken place, thereby involving a waste of the solvent, and an increased expense of time and labor in the manufacture of large masses of the solidified product. This excess of solvent renders the compound soft, and the excess must be separated from the mass by evaporation, or otherwise, before a solid and useful product can be obtained. We have overcome these objections by certain processes, for which we have obtained two several letters patent. The first method is that described in letters patent No. 91,341, issued to us June 15, 1869, and consists in using the smallest practicable proportion of a liquid solvent, and bringing it into contact with every part of the pyroxyline by heavy pressure, securing thereby cheaper and better results than had been heretofore described. The second method is that described in our reissued letters patent No. 5,928, dated June 23, 1874, in which a solid solvent is used, Which is latent at ordinary temperatures, but which becomes active by the application of heat. This method permitting a mechanical mixture, with the pyroxyline of the solvent in the precise proportions required to produce a solid result, the solvent remaining latent or inactive, to suit the convenience of the operator, but becoming active when required by the application of heat and pressure."

Having thus pointed out the objections to the old process, where solvents were used whose transforming action commenced at once, and which were used in such excess that subsequent evaporation was necessary to secure a solid product, and having indicated the improvements they had already patented, by one of which this excessive use of solvents was avoided and by the other of which a solvent (solid) was indicated whose transforming action did not commence at once upon mixture, but remained

suspended until an additional step in the process called it forth, the Hyatts next proceeded to specify the further improvement they were seeking to patent:

"Our present improvement consists in transforming pyroxyline into solidified collodion or 'celluloid,' by using a liquid instead of a solid solvent, which liquid solvent, like the solid, is latent at ordinary temperatures, but becomes active and dissolves the pyroxyline upon the application of heat. The following is a description of our improved process: 'We make a weak solution of camphor in alcohol, the proportions being, by weight, one part of camphor to eight parts of alcohol. This solution of camphor is not a solvent of pyroxyline at ordinary temperatures, and we there fore term it a latent liquid solvent; but it becomes an active solvent at an elevated temperature. There being differences, however, in the solubility of different grades of pyroxyline, a corresponding change in the strength of the solution of camphor becomes necessary, which may readily be determined by experiment. {After the pyroxyline is reduced to a pulp, mixed with coloring matter, and the aqueous moisture expelled,} we then add to the dried pyroxyline, or pyroxyline compound, the above-described latent liquid solvent in about the proportion, by weight, of 50 parts of the solvent to 100 parts of the pyroxyline. The solvent is stirred into the pulp, and the whole kept in a closed vessel until the solvent becomes evenly diffused throughout the mass; no solvent action taking place to retard or prevent this even diffusion, as would be the case in the use of solvents that are active at ordinary temperatures. The Compound is then subjected to heat and pressure in a similar manner to that employed when using the solid solvents, described in our reissued letters patent No. 5,928. Any liquid solvent of pyroxyline that is latent at an ordinary temperature, and that becomes active at a higher temperature, can be used as a substitute for camphor and alcohol in our improved process. The latent solvent may be combined with the pyroxyline without first reducing the pyroxyline to a pulp. In doing so we add the latent solvent to the pyroxyline, and, after allowing it to become diffused, preferably in a closed vessel, we develop the latent solvent, and complete the transformation of the pyroxyline either in heated moulds under pressure, or by passing the compound through heated rollers; in the latter case the heat developing the activity of the solvent, and the rollers compacting the compound. The coloring or other matter may also be added while the material is being masticated between the rollers, care being had to continue this masticating process until the component parts of the compound are thoroughly and evenly diffused throughout the mass.' The solvent and pyroxyline may also be mixed, and the compound subjected to heat, in any other suitable manner than those above described. Furthermore, the subjecting of the compound to pressure during the transforming or converting process is not essential to the working of our process, although the manufacture of the completed product is facilitated, and the cost there of lessened, by the combined action of heat and pressure, as hereinbefore described."

The claims made under this specification were:

"*First.* In the manufacture of solidified collodion, a liquid solvent that is latent, at an ordinary temperature, but which becomes active as a solvent when the temperature is increased, substantially as hereinbefore set forth. *Second.* In the manufacture of solidified collodion, a solution of camphor and alcohol combined essentially in the proportions described, whereby the solution is latent as a solvent at ordinary temperatures, but becomes active and transforms the pyroxyline on the application of heat, as hereinbefore set forth."

This application was at first rejected, on the ground that the claims were bad in form, and also that the solvent described is mentioned and disclaimed in the Hyatt patent of 1870, (the original of reissue 5,928,) as being then old. This disclaimer referred to "camphor made into a solution with alcohol," without any restriction as to the proportions of its components. Thereupon the Hyatts amended both claims as to form. They altered the second claim so as to specify the proportions of the camphor, (alcohol compound,) making it read as follows:

"*Second.* In the manufacture of solidified collodion the process of making a homogeneous mass by mixing pyroxyline with 1 part of camphor and 8 parts of alcohol, which forms a solvent that will remain latent at ordinary temperatures, and becomes active upon the application of heat, substantially as described."

They also amended the first claim by inserting the word "only," so as to read, as it does in the patent issued:

"*First.* The process herein described of manufacturing solidified collodion by mixing pyroxyline with a latent liquid solvent, which becomes active only upon the application of heat, as and for the purposes set forth."

They also addressed an argument to the commissioner of patents, October, 1874, pointing out that their invention consisted "in the employment of a liquid solvent of such composition and proportions that it is perfectly latent until the mass it is intended to solve is subjected to a Certain degree of heat. The Solvents described in the references are not liquid latent solvents, either by nature or in use, but are active, and perform their office immediately when brought in contact with the pyroxyline." They refer to the specification as setting forth the difference in action and result between active and latent liquid solvents, and add that the camphor-alcohol solvent, disclaimed, is, "like all others then known, 'an active agent,' and will not effect the transformation in the manner sought to be covered by our present process. All other liquid solvents are active; that is, they perform their transforming function as soon as they are brought in contact with the pyroxyline. Our present latent liquid solvent does not effect the transformation of the pyroxyline by simple contact, but remains combined therewith, and perfectly inactive, until its power is commanded by the application of heat."

Thereupon the patent was issued.

In view of the state of the aft as set forth in Judge SHIPMAN'S opinion, *supra,* and in this brief narrative of the circumstances under which the patent in suit was issued, what construction is to be placed upon the word "latent," as used in the claim? The complainant, it will be remembered, insists that it should cover any liquid solvent which, though active as respects the pyroxyline with which it is brought in contact, is used with such a relatively large mass of pyroxyline that the mass will not be converted into solid-

ified collodion at ordinary temperatures. So broad a construction does not seem to be warranted by the facts of this case

First. The various improvements or modifications in the process of manufacturing solidified collodion which are disclosed in the earlier

patents, to the Hyatts are outstanding against this patent, just as much as if they were issued to strangers. The patent is to be construed in view of the state of the art when it was issued, although the art had been advanced to that state largely by inventions of their own. Moreover, the paten secures to the patentees only what they asked for and accepted. What their invention was is to be ascertained from the patent itself, not from, subsequent statements of the inventors, with which its phraseology does not harmonize. *Vulcanite Co.* v. *Davis,* 102 U. S. 222; *Shepard* v. *Carrigan,* 116 U. S. 593, 6 Sup. Ct. Rep. 493; *White* v. *Dunbar,* 119 U. S. 52, 7 Sup. Ct. Rep. 72.

Second. The ordinary meaning of the word "latent," when used in the description of any substance possessing inherent power, would import that such power was not manifested,—was hidden, concealed, not visible or apparent. It would not fairly describe a condition where the power was in part displayed or manifested.

Third. The phraseology of the specifications imports some peculiarity in the liquid solvent itself. After describing the weak solution of camphor and alcohol, there appears this clause: *"This solution* of camphor is not a solvent of pyroxyline at ordinary temperatures, and we there fore term it a latent liquid solvent." If the present contention as to the meaning of the word "latent" is to be accepted, it would be difficult to conceive of any possible solution of camphor, or of anything else, which could not, with equal propriety, be called "latent." If the discovery sought to be availed of was the possibility of arresting the action of any solvent by reducing the quantity of the solvent applied to the mass, it is very strange that language should have been used which imported the use of some peculiar solvent.

Fourth. The word "latent" had a meaning in the art. It was first introduced in the reissue No. 5,928 as descriptive of the dry powdered camphor therein used. As pointed out, *supra,* the camphor, as used in that patent, remained inert, inactive, exerting no action upon the pyroxylins with which it was mixed, not even commencing operations by dissolving small portions of it. To define such action, or, rather, such non-action, of the solid ccamphor-gum, the word "latent" was selected. Surely, an apt selection. Thereafter, when the word "latent" is used in the celluloid art without some qualification, it would naturally be understood to have the meaning given by the text of the patent in which it was first used, as illustrated by the process which that patent pointed out.

Fifth. The patent itself indicates that the word is used with that meaning. It refers to the reissue "in which a solid solvent is used, which is latent at ordinary temperatures," and then prescribes the use of a liquid instead of a solid solvent, "which liquid solvent, like the solid, is latent at ordinary temperatures." The language Of the specifications and of the argument addressed to the commissioner of patents, which refers to their new solvent as one "perfectly latent" or "perfectly inactive," seems to indicate quite clearly that the construction now contended for was not thought of when the patent was issued.

Sixth. The process described in the patent is not inconsistent with this construction of the word "latent." It is no doubt true that when a ball of pyroxyline about the size of a walnut is dropped into a bottle containing two ounces of the weak solution of camphor and alcohol described in the patent it is entirely absorbed. But the patent states that the components are to be combined in "about the proportions, by weight, of fifty parts of the solvent to one hundred parts of the pyroxyline." When so combined, the compound apparently presents the same practical result as would follow the use of dry camphor alone.

Seventh. It is urged by the complainants that the patent is not limited either as to the strength of the solvent to be used or as to the proportions in which it is to be combined with the pyroxyline; that two separate processes are provided for,—the one contemplating pressure in heated moulds, the other mastication under heated rollers; that the specific statement of ingredients and proportions refers only to the first method; and that for the second method the patent covers practically any ingredients in any proportions. The language of the specification warrants no such construction. It describes "a weak solution of camphor in alcohol, the proportion being, by weight, one part of camphor to eight parts Of alcohol. This is the solution which the patentees say they make in their improved process, which they state is not a solvent at ordinary temperatures; which they there fore term a latent "liquid solvent." The specification proceeds: "There being differences, however, in the solubility of different grades of pyroxyline, a corresponding change in the strength of the solution of camphor becomes necessary, which may readily be determined by experiment." This provides for but a limited change. When abnormal pyroxyline is used, the solution of the patent is to be modified so far only as to give it the same strength, relatively, to the abnormal pyroxyline as the one to eight solution possesses relatively to normals pyroxylinexs.

The specification next provides for a reduction of the pyroxyline to a pulp, and its mixture "with the *above-described latent liquid solvent* in about the proportions by weight of 50 parts of the solvent to 100 parts of the pyroxyline;" the compound to be then subjected to the process of pressure in heated moulds. The specification proceeds: "Any liquid solvent of pyroxyline that is latent at an ordinary temperature, and that becomes active at a higher temperature, can be used as a substitute for camphor and a alcohol in our improved process." This surely is not, as complainants insist, a direction to those skilled in the art to use different proportions of camphor and alcohol, when completing the process under masticating rollers, as provided for in the next succeeding sentences of the patent. It is a general provision, applicable equally to the die and to the roller process, contemplating the discovery of some other liquid solvent than camphor and alcohol, which, like the special solution of the patent, might conduct itself "like the solid" when mechanically mixed with pyroxyline. Whenever "any latent liquid solvent" other than the solution of their improved process should come to light, the patentees intended

that it should be covered by this patent; they being the first to point out the use of latent solvents, both solid and liquid. The specification then proceeds as follows:

"The latent solvent *[i. e.,* the one herein specifically described as one to eight camphor and alcohol, or as modified to meet modifications in the pyroxyline, or any liquid solvent which is latent in the sense of the patent, and which can be used as a substitute for camphor and alcohol] may be combined with the pyroxyline without first reducing the pyroxyline to a pulp. In doing so we add the latent solvent to the pyroxyline, and, after allowing it to become diffused, preferably in a closed vessel, we develop the latent solvent, and complete the transformation of the pyroxyline either in heated moulds, under pressure, as in the previously described process, *[i. e.,* the one where pyroxyline was first reduced to a pulp,] or by passing the compound through heated rollers; in the latter case the heat developing the activity of the solvent, and the rollers compacting the compound."

While this indicates that when the pyroxyline is not reduced to a pulp a process of mastication under heated rollers may be substituted for the pressure in heated moulds, it does not call for any change in the composition of the solvent when so used. The word "latent," as used in the claim, there fore, cannot be held to cover liquid solvents which are not, "like the solid, latent" at ordinary temperatures.

It only remains to determine whether the defendants infringe the first claim of the patent as thus construed. They do not use the 1 to 8 solution of camphor and alcohol, but one composed of 35 to 40 parts of camphor and, 50 parts of wood alcohol. This, as complainants' witnesses concede, is by no means a weak solution. This solution they mix with pyroxyline in the proportions of about 85 to 90 parts of solvent to 100 parts of pyroxyline. That such a solution is an active solvent of so much of the pyroxyline as it comes in contact with is practically not disputed; in fact it is one of the most active known. That it has acted upon such parts of the pyroxyline so as to break down their fibrous constitution, and produce, in combination with them, a yellowish, semi-transparent, glutinous compound, which is neither pyroxyline nor camphor and, alcohol, is the universal testimony of the exhibits. Nor does the witness McLaughlin substantially contradict this, for he says that "usually oh the top of the batch that was soaked it looked something like the sample, [Monroe experiment, No. 1.]" As the defendants, there fore, use neither a weak solution of camphor and alcohol, nor mix it with pyroxyline in the proportions specified, nor use any liquid solvent "which, like the solid, is latent at ordinary temperatures," they cannot be held to infringe. Bill dismissed.