

equity pending proceedings of the character we are now considering.

In view of the possibility that this case may come to us again on an appeal from a decree after a hearing on bill, answer, and proofs, we do not deem it prudent to express ourselves more in detail than we have.

It is urged that the complainant below is not constructing machines under the patent in issue, or otherwise making use of it; but there is no assignment of error in regard to this proposition, nor is the record in condition to enable us to dispose of it intelligently.

We adopt the form of order used in *Davis Electrical Works v. Edison Electric Light Co.*, 8 C. C. A. 615, 60 Fed. 276, 283, already cited, reaffirming the expression which, in the opinion in that case, immediately preceded the order. The order appealed from is affirmed, with costs.

ATLANTIC DYNAMITE CO. et al. v. CLIMAX POWDER MANUF'G CO.

(Circuit Court, W. D. Pennsylvania. March 10, 1895.)

PATENTS—CONSTRUCTION AND INFRINGEMENT—HIGH-GRADE POWDERS.

The Schrader patents (No. 333,344, for an explosive compound or porous-grained dope, and No. 333,347, for dynamite) are not of a pioneer character, entitled to a broad construction, but, in view of the prior state of the art, the limitations of the specifications and claims, and the disclaimers made by the applicant, must be restricted to a dope and high-grade powder made of the proportions of ingredients disclosed, or of their substantial equivalents, and possessing the characteristics designated in the patents. *Held*, therefore, that the patents are not infringed by the "Big Chief" powder, made by defendant, which contains some ingredients of a different kind, and in materially different proportions, and in which the proportion of nitroglycerine is but 6 per cent. as compared with a minimum of 10 and a maximum of 20 per cent. in the powder of the patents.

This was a bill in equity by the Atlantic Dynamite Company and the Repauno Chemical Company against the Climax Powder Manufacturing Company for alleged infringement of two patents relating to explosives.

Betts, Hyde & Betts, for plaintiffs.
Bakewell & Bakewell, for defendant.

BUFFINGTON, District Judge. This is a bill in equity, brought by the Atlantic Dynamite Company and the Repauno Chemical Company, assignees of two patents, hereinafter referred to as the "Schrader Patents," for alleged infringement of the same, against the Climax Powder Manufacturing Company. The patents in question are No. 333,344, for an explosive compound, applied for May 29, 1884, and issued December 29, 1885, to John C. Schrader and Russell S. Penniman, his assignee (the single claim of which is for "the porous-grained dope, substantially as hereinbefore set forth, embodying in each grain thereof a cellular mass of sulphur, within which combustible or noncombustible matters, such as vegetable or woody fiber, or coal, or asbestos, or furnace slag, or nitrates, are held as components of said grains"), and No. 333,347, for dynamite, applied

for June 3, 1884, and issued December 29, 1885, to the same parties (the single claim of which is for "the explosive compound, substantially as hereinbefore described, containing nitroglycerine housed and retained within hard cellular grains, composed in part of particles of solid carbonaceous matter held by a porous structure of sulphur").

The first patent is for a "dope" or base for an explosive; the second, for the dope embodied in the first patent with nitroglycerine added. Complainants contend their patents are pioneer ones, and, as such, their claims are entitled to a broad construction; while respondents contend the patents are void for lack of invention, or, if valid, that, by reason "of the express limitations and restrictions of the specifications and claims of the said letters patent, and the disclaimers made by said patentee during the prosecution of the applications for said patents, neither of said letters patent can be construed to cover or include anything ever made, sold, or used by the respondents." The record presents a great amount of testimony, a very considerable portion of which is given by eminent chemists, and presents many questions of interest. It has received from the court the most careful and painstaking consideration of which a nonprofessional person in those lines of learning is capable. The view we take of this case does not require us to pass upon every question raised in the proofs, interesting as such inquiry would be to us; but we deem it our province to confine ourselves wholly to those questions which, in our judgment, constitute the issues in this case. Conceding, for present purposes, the validity of the patents, we have two inquiries before us: First, the nature of the invention disclosed by the patents, and the interpretation of their claims; and, secondly, have the claims, as thus determined, been infringed by respondents?

As complainants contend their patents are pioneer ones in nitroglycerine explosives, inquiry must be made as to the prior art. Nitroglycerine was discovered by Sobrero, an Italian chemist, in 1846. It is a fluid, formed by the action of concentrated nitric acid, in the presence of strong sulphuric acid, upon glycerine, at a low temperature. It freezes or crystallizes at 40 degrees Fahrenheit, and slowly liquifies again at 50 degrees. It must be handled with great care, as it is readily exploded by a blow or shock. This fact, added to its liability to leakage, virtually prevented its transportation. Sobrero's discovery proved of little practical importance until about 1864, when Alfred Nobel, a Swede, made its commercial use possible. He found that "kieselguhr," an infusorial earth obtained in Germany, could be used as a dope or base to absorb and retain as much as 75 per cent. of nitroglycerine, and the powerful explosive thus produced could be transported with comparative safety. His new mixture was given the now familiar name of dynamite, and to Nobel is due the credit of the application of nitroglycerine to practical use. The kieselguhr dope, it will be noted, was, so far as the explosive was concerned, an inert mass; and its sole purpose was as a receptacle for nitroglycerine. In 1873, Nobel, in his patent, No. 141,455, disclosed the idea of using a combustible dope, which, while capable of carrying the nitroglycerine, would also contribute to the explosive force of the

compound. His compound consisted of 70 parts of pulverized nitrate of soda, 10 parts of pulverized resin and 20 parts of nitroglycerine. He specified that, "instead of resin, other carbons or hydrocarbons, coal," etc., might be used, and that 5 to 8 parts of flour sulphur may be added. These ingredients were to be thoroughly mixed, "so that, so far as possible, each separate particle of the pulverized solid ingredients may have a coating of nitroglycerine." In 1874, Mowbray, in patent No. 150,428, taught the use of extremely minute scales of mica as a base, which, though noncombustible, were externally coated with nitroglycerine, as contrasted with the absorbing or capillary action of Nobel's kieselguhr. The external coating or film of nitroglycerine, thus shown with a noncombustible dope, has been used to great advantage to increase the efficacy of the explosive, when, in the subsequent development of the art, it was applied to a combustible dope. It will be noted that all of these powders required a large amount of nitroglycerine; the lowest, the Nobel, having 20 per cent. They were of a class which, from this fact, came, in the after development of the art, to be styled "high-grade powders."

In 1876, Egbert Judson, of California, made a marked departure from prior methods, in patent No. 183,764. His idea was to largely reduce the amount of nitroglycerine, and thus cheapen cost, but at the same time produce a powerful explosive. His specification recites that, in former practice, seldom less than 15 per cent. of nitroglycerine had proved effective, while, in fact, from 30 to 40 per cent. was generally used; that his purpose was to produce a cheap, safe, and powerful explosive, with 1, 2, or 3 per cent. nitroglycerine. He contemplated, also, as we shall see, the possibility of the use of as much as 15 per cent. The specification recognized that, owing to the absorbent nature of prior dopes, a small percentage of nitroglycerine was "so completely absorbed or taken up by the dry mixture that the compound becomes practically inexplusive." Judson's object was to so modify or counteract the absorbent capacity of the dope "that," as he says, "its grains * * * will receive and retain the nitroglycerine upon their surfaces, or mainly upon their surfaces, with little or no absorption." By this means, a very small proportion of it would maintain an external continuity throughout the grain mass, and make the whole explosive. He also purposed lessening its tendency to absorb moisture. To secure these results, he directed that "the grains or particles of the dry mixture shall be coated, cemented, varnished, or smeared with some combustible substance, offering resistance to absorption of nitroglycerine and of water," etc. He suggests a range of variation in the ingredients, from such as are "extremely fine or pulverulent," to those which are coarser,—a fact worthy of consideration in determining the scope of the patents and the experiments made by the respective experts. As illustrative of one method of making his powder, he takes 15 parts of sulphur, 3 of resin, 2 of asphalt, 70 of nitrate of soda, and 10 of anthracite coal. The sulphur, resin, and asphalt are melted together, and well stirred, and in this mixture, while melted, the nitrate of soda and coal, both pulverized and thoroughly dried, are to be mixed and well stirred, until thoroughly varnished, cemented, or coated by the melted mix-

ture. After this, the mixture is gently and constantly stirred, until it is so cool the grains cease to adhere to each other. He adds:

"The dry mixture is then complete, and ready to receive the nitroglycerine, which may be added as desired. One, two, or three per cent. of nitroglycerine will now convert the compound into a powerful explosive; or the proportion may be increased, at pleasure up to 15 per cent., or even more."

That Judson did not contemplate that his grains should be absolutely nonabsorbent is clear. On the contrary, he goes to the length of expressly disavowing such an absolute character for them. He says he uses the term, "nonabsorbent," in contradistinction to such absorbent mixtures as have heretofore been used in this class of powder," and says they are sufficiently nonabsorbent "as to mainly counteract the absorption of the nitroglycerine," and, as noted above, that his invention demands that the coating or varnishing shall be with some combustible substance, "offering resistance to absorption of nitroglycerine." That the grain was also of varying character, within certain limits, is also evidenced by the wide range of nitroglycerine that may be added, viz. from 1 to 15 per cent., or more. Construing the term "nonabsorbent," here used, as we think it must be, with reference to the prior art, and in accordance with the teaching of the patent, as shown in the context, we think it means relatively nonabsorbent, as compared with prior practice. Indeed, the explicit disclaimer by Judson of an absolutely nonabsorbent character for his grains affords additional ground for such construction to those in *Adams v. Iron Co.*, 26 Fed. 324, where "a perfect cast-copper cylinder, * * * free from blow holes and other defects," was held to mean one "so free from blow holes as to be considered sound," or in *Blumenthal v. Burrell*, 3 C. C. A. 462, 53 Fed. 105, where the court said: "We do not suppose that the language of the patent [chymosin "uncombined with pepsin"] demands an absolutely chemically pure article, but an article practically free from pepsin."

As we view the advance made by Judson in the art, he taught the making of a grain of such nonabsorbent, or relatively nonabsorbent, character, as compared with prior dopes, that from 1 to 15 per cent. of nitroglycerine could be utilized to make a powerful explosive. That he was the first to produce a "low-grade," nitroglycerine powder seems quite clear from a study of the art, and we think he is justly styled, by Mr. Penniman, complainants' chemist, "the inventor and founder of the low-grade powder business in the United States." Whether the variations he suggests in the way of pulverizing the materials he specifies would produce a powder of the free-running capacity afterwards suggested in the patents now in suit, and whether, if so, his patent was an anticipation of these patents, we do not deem it necessary to now decide, seeing we have assumed, for present purposes, the patentable novelty of that which it is therein claimed. Under the peculiar conditions of mining existing on the Pacific coast, where Judson manufactured, the free-running capacity of powder was, or would have been, a matter of indifference. There is no evidence that he ever made a free-running powder, nor that the trade needs demanded such an article there; but it is highly suggestive, when considering the scope of his patent, that defendant's experts,

by using the ingredients suggested in his patents, and pulverizing them to an extent certainly not at variance with his suggested directions, have produced a low-grade powder which has a free-running capacity, for which free-running capacity, in part, the complainants would ascribe a pioneer character to the Schrader patents.

The patent of Thomas Varney, of 1881, No. 249,701, shows an attempt to produce a low-grade powder, in which, as distinguished from Judson's, the grains were of a highly absorbent character. Varney states that, to obtain the highest degree of explosive force from the absorbent, it must be finely divided, but that such fine division makes it more absorbent. The result is that from 15 to 85 per cent. of nitroglycerine is required, and to produce a powder capable of detonation with from 3 to 6 per cent. of nitroglycerine requires the absorbent to be very coarse, which weakens the powder. "My invention," he says, "does away with the necessity of coarseness by giving the absorbent a peculiar porosity, which facilitates detonation and the decomposition of the absorbent." His suggested method is:

"The powder, which I call 'Varney Powder,' is prepared as follows: The materials of the absorbent are made fine. The finer they are, the stronger will be the powder. These fine particles are then aggregated, or collected into small assemblages. This is done by distributing among them, evenly, a certain proportion of some pulverized solid substance capable of being softened or made pasty while in mixture, whereby each soft particle will attach to itself all the solid particles in contact with it, and, when hardened, will hold them in this contact, and thereafter remain in the mixture in this aggregated form."

He adds:

"Used as an absorbent, it admits of detonation with a very small proportion of nitroglycerine; in general, about one-fourth of the amount required before aggregating. It also gives, so far as I have been able to ascertain, all the strength due to fineness. This strength and readiness to detonate I attribute to the kind and degree of porosity, and exposure of the fine particles, by which the explosive influence from the exploder is applied to the nitroglycerine, and the heat of the detonating nitroglycerine is applied to the absorbent more favorably than when the absorbent is coarse."

He states:

"From 3 to 6 per cent. of nitroglycerine, according to the character of the exploder, mixed with any of these absorbents, can be detonated with remarkable explosive effect. Of course, greater proportions of nitroglycerine may be used, if desirable."

While this powder was commercially a failure, yet, as showing the extent and scope of the patents in suit, with reference to the pioneer character claimed for them, the admission of Prof. Chandler, one of complainants' experts, is suggestive. He was asked: "In making this Varney dope, if you had simply increased the proportion of sulphur from 8 per cent. to 16 per cent., and had treated the mass so compounded in precisely the same way as you treated the mass for making the Varney dope, wouldn't you have obtained precisely the same result as you obtained in making the so-called Schrader dope?" To which he answered: "I think very likely."

In this state of the art the patents in suit were applied for in 1884. To us it is quite clear that, at that time, the object of Mr. Schrader was, and we think this is quite clear from a detailed study of the pat-

ents, to provide a high-grade absorbing powder, and a dope for such a powder,—one that would internally take up and securely retain large and effective quantities of nitroglycerine, without having it show substantially on the surface, and that the powder should be dry-grained and free-running powder and was to be of a different class from either Judson's or Varney's. Their purpose was to make a low-grade powder; his, a high-grade one. That such was the fact is evidenced by his own words. Thus, he says he has "invented certain new and useful improvements in high-explosive compounds." "I am the first to invent and produce a dry-grained, free-running, high-grade, nitroglycerine powder." That he named a maximum of 20 and a minimum of 10 per cent. of nitroglycerine as his contemplated limits of nitroglycerine absorption is, to our mind, clearly evidenced. Thus, he says: "The subject hereinafter described is a dry-grained, free-running powder, containing as high as, say, 20 per cent. of nitroglycerine, or any lesser proportion of the liquid explosive that may be deemed desirable." The limit, however, of this decreasing proportion he had previously named, saying, "My novel powder, as a class, although containing large proportions of the liquid explosive, ranging from 10 per cent. upward," etc. He very explicitly stamps it as a high-grade powder, and differentiates it from low-grade ones in the language following. Thus, he says of Judson's, "My high-explosive powder is radically unlike that variety of low-grade nitroglycerine, composed of grains," etc. He speaks of his grains as capable of taking in and retaining "large and effective proportions" of nitroglycerine. And of Varney's he says:

"My powder is also radically unlike certain other varieties of low-grade nitroglycerine powders, which are composed of finely-comminuted solid matters, and, say, from 3 to 6 per cent. of the liquid explosive, because the solid matter referred to is in such a finely-comminuted condition that any greater proportion of the liquid will render the mass clingy or pasty; and, although such powders are of the low-grade variety, they are not free-running, because of the natural cohesion of the finely-comminuted solid matters, and also because of the incapacity of said solid matters to take up and house effective proportions of the liquid explosive without becoming adhesive, and also because of the employment, in many cases, of solid matters, which readily succumb to the softening influences of the liquid explosive."

That the high proportions of nitroglycerine which he has before mentioned were the very essential features and characteristics of his patent is evidenced when he says:

"It is obvious that additional ingredients may be employed in the grained compound without substantial departure from any invention, provided nothing is added which will materially impair the capacity of the grains for taking up the liquid explosive by plugging or sealing the cells of the grains against its entrance, as by the use of tar, asphaltum, &c."

In addition to this, it should be noted that there is no express averment in the patents that his method could be applied to making low-grade powders, and no implied suggestion, save the mention of 20 per cent. "or any lesser proportion," quoted above, which, we have seen, must be read in connection with his prior expressed minimum of 10 per cent. This powder he purposes making from ingredients, all of which, he says, are old. It is obvious, then, that the novelty must consist in producing a novel powder or dope by means of new combinations of proportions of old materials, for no specially new

methods of treatment are taught. As pertinent to the present case, the ingredients suggested are 12 parts of bituminous coal, 16 parts of sulphur, and 72 parts of nitrate of soda. These ingredients, dry, finely ground, and well mixed, are heated and developed into grains. The proportions may be varied, but care must be "taken to have enough sulphur, when melted, to properly control the dry matter for graining, and also to avoid such an excess of sulphur as would result in grains which would be practically inaccessible to, or, at least, materially obstruct, the entrance of the liquid explosive." The grain thus produced is described as a "friable, cellular" one, as having a capacity of taking up and securely retaining, by capillary attraction, as high as 40 per cent. of liquid explosive, without materially affecting the dry-grained, free-running, or crisp characteristics which said grains possessed prior to charging them with said liquid explosive. And that this process of housing the liquid was not a surface one is clearly shown when he says the grains are "capable of taking up, completely housing, and securely retaining highly effective proportions of any liquid explosive, so that, when thus charged, the dope will maintain substantially its original condition, or, in other words, so that the presence of the liquid explosive will not be substantially observable as a liquid, or as an adhesive medium." The absorbent characteristic of the grains was emphasized in applicant's argument upon rejection, where it was said:

"The dope described by applicant's claim is porous and highly absorbent, because the sulphur in each grain is a cellular mass."

And again:

"The porous character of applicant's dope is an essential feature, and this could not possibly be present in the grains of the patent 4,200, of '80, because, in the latter, 'resin' is employed, which would obviously render them impervious and nonabsorbent, and unsuited for applicant's purpose."

So, also:

"It might be well to here observe that applicant * * * describes 'pressure' in the process of forming the grains, but it will be seen that it must be 'light pressure,' because the grains must be very porous, instead of 'very solid and nonporous,' as when produced by Nobel," etc.

It is also to be noted that, after rejection of the claim, the term "porous" was added to the claim, in the "porous-grained dope" finally allowed.

In view of the advance disclosed by the prior art and of the limitations expressly stated and necessarily following from the statements in the patents themselves, we cannot accord to them the pioneer character, or to their claims the broad construction, contended for by complainants. To do so would be fatal to the patents. To us it seems the claims must be limited to a dope and high-grade powder made of the proportions of ingredients disclosed, or of their substantial equivalents, and which possess the characteristics indicated in the patents.

Construing the claims thus, we next inquire whether infringement, the burden of which rests on the complainants, has been proved? The powder manufactured by respondents, and complained of as infringing, is known as "Big Chief." In the art of powder making, it seems well established that, the larger the proportions or the greater

the efficacy of the binding material used, the less porous will be the grain, and that increasing the binding material made a harder, tougher, and less absorbent grain, and, conversely, that decreasing it made a more friable and absorbent one; in other words, that binders are employed at the expense of grain strength. It would also seem, from the weight of the proofs in this case, that, as bearing on the relative efficiency of the binders concerned in this case, resin has the greatest binding efficacy, glucose the next, asphalt next, and sulphur the least. It would also seem that, from the same ingredients, grains of a greater or less relative nonabsorbent character can be made, as the apparatus employed has a greater or less grain-compacting efficiency. The less compacted the grain is, the greater will be its relative absorbent capacity.

Turning, now, to the question of ingredients, we take the analysis of a sample of Big Chief powder, reported by Dr. Munroe, one of complainants' experts, as a standard of comparison. It is as follows:

Resin	4.77
Glucose.....	2.84
Coal	10.50
Sulphur	19.81
NaNO	57.09
Nitroglycerine	4.99
Total	100.00

And the probable composition of the powder is stated by him at:

Glucose.....	3	per cent.
Resin	5	" "
Coal	11	" "
Sulphur	21	" "
Soda	60	" "
Total	100	" "

And five pounds of nitroglycerine for every hundred pounds of dope.

Applying these proportions of ingredients to batches of dope of 541 and 500 pounds, respectively, the quantity testified to by respondent's workmen as commercially made by them, and comparing the results to the ingredients of the Big Chief dope, as testified to by them, we have the following:

Dr. Munroe's Analysis of Probable Constituents.	Probable Constituents Applied to 541-lb. Batch.	Same to 500-lb. Batch.	Constituents Testified to by Workmen in 541-lb. B. C. Dope.	Same in 500-lb. Batch.
Glucose..... 8 per cent.	16 lbs.	15 lbs.	15 lbs.	15 lbs.
Resin..... 5 "	27 "	25 "	25 "	25 "
Coal..... 11 "	60 "	55 "	63 "	55 "
Sulphur..... 21 "	114 "	105 "	105 "	105 "
Soda..... 60 "	325 "	300 "	338 "	300 "
Total.....100 "	543 "	500 "	541 "	500 "
Nitroglycerine... 5	27 lbs.	25 lbs.	81 lbs.	81 lbs.

These results would seem to render comparatively certain the ingredients employed in the alleged infringing powder. Resin, as we have seen, is a most efficacious binder. It renders the grains less porous and less absorbent. It is not used in the Schrader patent formula, and, as we have seen, in the argument made for the allowance of the patent, it was stated to be at variance with the object of the patent, and its use destructive to the desired porosity of the grains. Thus:

"The porous chemicals of applicant's dope are an essential feature, and this could not possibly be present in the grains of the patent 4,200 of '80, because, in the latter 'resin' is employed, which would obviously render them impervious and nonabsorbent, and unsuited for applicant's purpose."

The language is so explicit that, taken in connection with the occasion of its employment, it amounts to a disclaimer of the use of resin. See *Smith v. Gas Co.*, 42 Fed. 150, and cases cited.

Dr. Munroe's analysis shows that Big Chief contains 3 per cent. of glucose and the proofs show that 15 parts of glucose out of 541, and 15 out of 500, were used in manufacture by defendant. The Schrader patent formula calls for none, and, as we have seen, glucose is a binder of high relative efficacy, and tends to make the grains less absorbent. Dr. Munroe's analysis shows 21 per cent. of sulphur in Big Chief, and the proofs show the use of 105 parts out of 541 and the same number out of 500. In the Schrader patent formula, the percentage of sulphur is 16 per cent., or 80 parts to 500. In the Schrader formula 72 per cent. of nitrate of soda is used; in the Big Chief, 60 per cent; and, in the dope proven by the workmen, 333 out of 541, or 300 out of 500. The proportion of coal is substantially the same in each, but the amount of inert material in the two is relatively considerably greater in the Schrader. Thus: In the Schrader formula: Coal, 12; soda, 72,—total, 84. In Morton's analysis of Big Chief: Coal, 11; soda, 60,—total, 71 per cent. These figures show that the amount of binding material in the Big Chief is practically 29 per cent., and that a considerable proportion of these binders, very nearly one-third, is of higher relative binding efficacy than sulphur, which is the only binder used in the Schrader formula, and of it only 16 per cent. The binding material in the Big Chief is more than one-third the weight of the material to be bound, while in the Schrader it is less than one-fifth. The significance of these proportions is apparent when coupled with the proofs of complainants' witnesses. Mr. Schrader, the patentee, says "that, as the proportion of sulphur introduced is increased, it correspondingly and proportionately tends to fill up the crevices in the grains; hence, renders the grains less absorbent, if the same amount of pressure in each case,—that is to say, as the proportion of sulphur varies,—is applied to said grains." And, when asked how much sulphur would have to be added to his patent dope to make a practically solid grain, without subjecting it to pressure, says: "It depends upon the fineness of the ingredients and the amount of agitation, which, to a certain extent, means pressure on a small scale. I should, however, say that, with ingredients of moderate fineness, such as would pass through, say, a No. 20 or 30 mesh sieve, 22 per cent. of sulphur will make nearly a solid grain."

There is also a difference between the Schrader patent teaching and respondent's method of manufacturing. It will be noted that, in the argument, before referred to, for allowance of the patent, the porosity of the grain and the desirability of a lightly-compressed grain were referred to, and the fact that any pressure applied to it must necessarily be a light one. In the manufacture of the Big Chief very considerable pressure is exerted, and this with a view to making a hard, strong, and relatively nonabsorbent grain. Mr. Hopke, one of respondent's expert chemists, made several batches of dope, some at Pittsburg and some at respondent's works at Emporium, Pa. He says:

"In addition to the above causes, I may mention that the apparatus used by the defendant in their manufacture of the Big Chief powder, consisting of vertically moving paddles or beaters, which act with percussion as they stir the dope in the kettle, and also the mode by which the plastic mass is forced against and through the meshes of a screen, materially compact and force together the particles. This I have determined by careful tests, making dopes of a similar composition in an open kettle with paddles, and also in the defendant's apparatus, and these tests respectively show that the dope made in the defendant's apparatus is denser and more compact."

To the same effect is the testimony of Mr. Handy, another of respondent's chemists, who says:

"The compacting action is partly due to the action of the paddles or stirrers in the kettles, and partly to the forcing of the dope through the graining screen. This will account for the greater hardness of the 4-mesh grains of Schrader and Judson dopes, made in August, in the defendant's apparatus. They are distinctly harder and more dense than the Judson and Schrader dopes made by me in the open, hemispherical, steam-jacketed kettle, in November, and which were not forced, while hot, through a screen. The defendant's apparatus is not suited for the manufacture of dopes with small amounts of binding material, such as the Schrader dope."

From the differences in ingredients, in proportions used, and in methods of treatment, we would naturally expect differences in the grains produced. Such we find to be the case. The Schrader patent claims for its grains the qualities of hardness, friability, and crispness. "Friable" is defined by Webster as, "easily crumbled, pulverized, or reduced to powder." And "crisp," as "brittle or friable; in a condition to break with a short, sharp fracture." If, by the term "hard," as used in the patent, it is meant "relatively hard," as compared with the grains of Varney, or those of Nobel's patent, we can accept it; but, if the term is used as meaning not yielding to pressure, firm, and solid, and therefore not crisp or friable, we cannot accept it, for it is manifestly at variance with the teaching of the patent. Nor, indeed, do the proofs anywhere show that hard grains have been produced by using the ingredients and treatment of the Schrader patent. Accepting, then, as we think we must, the characteristics of a friable and crisp grain, we find the Big Chief in marked contrast with it in this regard. Dr. Morton, one of complainants' experts, concedes that, in dopes made by him, that made under the Schrader patent was much more easily crushed than the Big Chief, and that the difference between the two was decided. Mr. Hopke, respondent's expert, testifies that he subjected the Schrader handmade dope of Dr. Morton

to crushing tests, and found they broke when a weight of 500 grammes was applied, while grains of Big Chief broke at 3,400.

The patent of Schrader calls for porous and highly absorbent grains, such as "can be relied upon for taking up and securely retaining, by capillary attraction, a liquid explosive, up to, say, 20 per cent., without materially affecting the visible characteristics of said grains, and they will then be as dry-grained and free-running as when in their uncharged conditions." Mr. Schrader explicitly distinguished his powder from that of Judson, for which, though a relatively nonabsorbent one, a capacity was claimed of taking up 15 per cent. of nitroglycerine. The proofs show that the Big Chief powder, made and sold by respondent, contains about 6 per cent. With that amount, its presence is at once detected; and that it is present on the exterior of the grain, in substantial and appreciable amount, is shown by the fact that it freezes into a solid mass, and the grains are held together by a frozen film of nitroglycerine. Where 6 per cent. of nitroglycerine is added, the relative proportion of it to the dope, bulk for bulk, is a teaspoonful to a pint of dope. This fact, in itself, is suggestive that, if an appreciable amount was absorbed, the external continuity of film, which is conducive to the explosion, would be lost, and that freezing could not take place. That the Big Chief grain, as commercially made, is relatively nonabsorbent and nonporous is also shown by the clear weight of the evidence; and, if 10 per cent. of nitroglycerine is added, the minimum of the Schrader patent, instead of being absorbed, it leaks out, gathers in drops, and becomes unsafe to handle or transport. That the Big Chief is a free-running powder may be conceded, but this does not prove infringement. Conceding that Schrader may have been the first to produce a powder that was free-running by the use of certain ingredients, that fact does not block the way against every effort to produce a free-running powder by means that are substantially different, and at variance with Schrader's proposed methods. See *Incandescent Lamp Patent*, 73 O. G. 1289.¹ He taught that high-grade powder could be made having a free-running capacity. He neither taught nor claimed that a low-grade powder of that capacity could be made. The fact that the powder of Schrader's patent and the powder manufactured by respondent have this one point in common cannot obliterate the marked distinctions between them in ingredients and mode of manufacture. These differences are sufficient in kind and degree to very clearly relieve the respondent from the charge of infringement.

We are therefore of opinion infringement has not been shown. Let a decree dismissing this bill be prepared.

¹ *Consolidated Electric Light Co. v. McKeesport Light Co.*, 159 U. S. 465, 16 Sup. Ct. 75.

THE CERES.

WESSELS et al. v. THE CERES.

SYDVENSKA ANGFARTYGS AKTIEBOLAGET v. WESSELS et al.

(Circuit Court of Appeals, Second Circuit. March 17, 1896.)

1. CHARTER PARTY—GUARANTY OF SPEED—"LIGHT LADEN."

A charter party of a steamship for the fruit trade guaranteed that she should make a certain average speed in moderate weather, "fruit or light laden." *Held*, that the guaranty was not merely that she could attain that speed at the commencement of the term of hiring, but was a continuing guaranty that the average speed should be accomplished during the term of the charter under the conditions stated, and that "light laden" meant a cargo, the equivalent of a fruit cargo, or one not more cumbersome or more unfavorable to speed. 61 Fed. 701, affirmed.

2. SAME—DAMAGES FOR BREACH.

A guaranty, in a charter party for the fruit trade between Central America and New York, that the steamer shall make a certain average speed, is to be interpreted with a view to the necessity for speed with a perishable cargo; and deterioration of cargo occasioned by loss of time from failure to maintain such speed must be considered as damage in the contemplation of the parties on making the contract. 61 Fed. 701, affirmed. Wallace, Circuit Judge, dissenting.

3. SAME.

The charterers under such a charter party are not to be charged with heedlessness in continuing to run the vessel in the fruit trade after she had failed on several voyages to maintain the guaranteed speed, where the owners prevailed upon them not to throw up the contract by promises that the speed should be improved. Wallace, Circuit Judge, dissenting.

4. SAME—"LAY-UP" CLAUSE.

A provision, in a charter of a steamship for the fruit trade, that she "is to lay up for overhauling, two weeks each year, in winter, at time charterers designate," gives the charterers a right to have the vessel laid up annually, without paying hire, for two weeks, in the winter time, for the usual overhauling, but they cannot require her to lay up when all the circumstances show that the pretended lay-up is a subterfuge to evade payment of hire in the meantime. 61 Fed. 701, reversed.

5. SAME—CANCELLATION OF CHARTER—NOTICE.

A provision in a charter party giving the charterers an option to terminate it at any time on giving 30 days' notice, does not entitle the owners to 30 days' notice of a cancellation for breach of a guaranty on their part contained in the instrument.

Appeals from the District Court of the United States for the Southern District of New York.

These were cross libels for damages on a charter party of the steamship *Ceres*,—the first by Gerhard Wessels and others, the charterers, against the vessel; the second, by the *Sydvenska Angfartygs Aktiebolaget*, her owner, against the charterers. The district court entered a decree on the first libel in favor of libelants for \$7,320.04, and dismissed the cross libel. 61 Fed. 701. From each of these decrees the owner of the ship appealed.

J. Parker Kirlin, for appellants.

Harrington Putnam, for appellees.

Before WALLACE, LACOMBE, and SHIPMAN, Circuit Judges.