RECENT DECISIONS RELATING TO PATENTS.

Supreme Court of the United States.

TILGHMAN *vs.* PROCTOR *et al.*—SEPARATING FATS, OILS, GLYCERINE, ETC.

Mr. Justice Bradley delivered the opinion of the Court.

This case involves a consideration of the same patent which was the subject of litigation in the case of *Mitchell vs. Tilghman*, reported in 19 Wallace, 287. The evidence in the present case, which is quite an unwieldly mass, is much the same as in that, being supplemented, however, by the testimony of the patentee respecting the nature of his original experiments and the practicability of using profitably the coil apparatus described in the patent, together with certain exhibits relating to the novelty of the alleged invention. Upon the renewed consideration which has been given to the subject the court is unanimously of opinion, contrary to the decision in the Mitchell case, that the patent of Tilghman must be sustained as a patent for a process, and not merely for the particular mode of applying and using the process pointed out in the specification, and that the defendants have infringed it by the processes used by them.

The patent in question relates to the treatment of fats and oils, and is for a process of separating their component parts so as to render them better adapted to the uses of the arts. It was discovered by Chevreul, an eminent French chemist, as early as 1813, that ordinary fat, tallow, and oil are regular chemical compounds, consisting of a base which has been termed "glycerine," and of different acids, termed generally "fat acids," but specifically "stearic," "margaric," and "oleic" acids. These acids, in combination severally with glycerine, form stearine, margarine, and oleine. They are found in different proportions in the various neutral fats and oils, stearine predominating in some, margarine in others, and oleine in others. When separated from their base (glycerine) they take up an equivalent of water and are called "free fat acids." In this state they are in a condition for being utilized in the arts. The stearic and margaric acids form a whitish semi-transparent hard substance, resembling spermaceti, which is manufactured into candles. They are separated from the oleic acid, which is a thin oily fluid, by hydrostatic or other powerful pressure, the oleine being used for manufacturing soap and other purposes. The base (glycerine) when purified has come to be quite a desirable article for many uses.

The complainant's patent is dated the 3d day of October, 1854, and relates back to the 9th day of January of that year, being the date of an English patent granted to the patentee for the same invention. It has but a single claim, the words of which are as follows:

"Having now described the nature of my said invention and the manner of performing the same, I hereby declare that I claim as of my invention:

"The manufacturing of fat acids and glycerine from fatty bodies by the action of water at a high temperature and pressure."

In the case of Mitchell the majority of the Court was of opinion that in the application of the process thus claimed the patentee was confined to the method of using the process particularly pointed out in the specification, and as by that it was proposed to produce a very rapid separation of the fatty elements by the use of a high degree of heat—the operation being effected in the space of ten minutes by forcing the fat mixed with water through a long coil of strong iron tube passing through an oven or furnace, where it was subjected to a temperature equal to that of melting lead, or 612° Fah.—it was concluded by the Court that the producing of the same result in a boiler subjected to only 400° Fah., and requiring a period of several hours to effect the desired separation, was not an infringement of the patent, although the process by which the effect was produced—namely, the action of water in intimate mixture with the fat at a high temperature and under a sufficient pressure to prevent the formation of steam—was undoubtedly the same. On further reflection we are of opinion that in the case referred to sufficient consideration was not given to the fact that the patent is for a process, and not for any specific mechanism for carrying such process into effect.

Decree of the Circuit Court reversed and the patent sustained.

Our space only permits the presentation of a small portion of the decision, which is very interesting. The report *in extenso* will be found in SCIENTIFIC AMERICAN SUPPLEMENT, No. 278.

The Manufacture of Artificial Hydraulic Lime.

A few years ago an English writer on limes and cements suggested in our columns the advisability of preparing an artificial mixture of chalk and clay, rather than continue to employ the fat chalk limes which at one time were so much in favor with London builders. It was at once urged that, possessing, as we do, such vast deposits of gray chalk lime, or lime rich in silica and aluminum, and with a broad belt of liassic limestone running across England from Somersetshire to Yorkshire, it was quite unnecessary to think of preparing an artificial hydraulic lime, or to go to the expense of improving the limes made from pure chalk. It is impossible to deny that we have in this country many very excellent building limes; still, such limes do not exist in all parts of the country, and in the North of England the limes chiefly burnt from the carboniferous and mountain limestones are notoriously bad for structural purposes. Such being the case, a description of the great manufactories of artificial lime near Paris, which for some reason or other are rarely visited by English travelers, may not be without interest.

The rocky escarpment crowned by the fortress of Issy, which overlooks the plain of Meudon, is a chalk ridge, and the hill of Issy is an outcrop of the upper or flint-bearing chalk, which here is from 1,200 to 1,500 feet in thickness. The belts of flint run through it in perfectly horizontal lines or strata, showing its undisturbed geological position. The quarries of Issy are extremely interesting, as the workings are all in parallel galleries or tunnels having arched roofs, each gallery being three meters wide and seven meters high. These galleries are very numerous and intricate, and extend for great distances under the hill, as the quarrying has been practiced since 1829. The French Government engineers have the entire control of the quarrying operations, and decide upon the positions of the galleries and tunnels. The chalk is got by piecework; the men being paid 1·20 franc per cubic meter loaded on to the carts; this is about equivalent to 9*d.* per cubic yard. Considering that the men have to keep the galleries neatly trimmed, and the roofs a true arch, the price seems small, though we were given to understand that a good workman easily earns 5*s.* per diem at this work. The chalk, when brought to the works, is mixed with 20 per cent, by measure, of clay brought from Argenteuil. This is a gray plastic clay with veins of yellow and red, indicating the presence of iron. It is an excellent brick earth, and is largely employed at the potteries in the neighborhood for the manufacture of tiles, pans, drain pipes, etc.

The mixture of the chalk and clay is effected in two different ways: the one the summer plan, the other chiefly practiced in winter. As the drying of the compound is accomplished without artificial heat, it is necessary during the winter to effect the mixture of the chalk and clay with the least possible quantity of water; and to do this it is usual to employ during the cold months an ordinary vertical pug mill similar to that in use in brickworks. The chalk and clay are thrown in by shovelfuls at a time, five of chalk to one of clay (the chalk naturally contains about 4 per cent of clay). This compound is pugged twice, and then spread in small lumps on the floor of large sheds to dry. It becomes dry enough to put in the kilns in about twenty-four hours, or that spread one day can be burned the next. The calcination is effected in small running or continuous kilns with interstratified fuel; the fuel consists of small coal and gas coke. The burnt lime is drawn out twice a day, and placed in sheds, where it is slaked with a minimum of water. The slaked lime remains for five or six days in layers of considerable depth, after which it is ground and sifted. The grinding appears to be necessary, chiefly owing to a considerable proportion of "core" or underburnt material. From the sieves the lime passes into small sacks, in which it is sent out for use. Nearly all the hydraulic lime used in Paris is thus sent out by the burner as *slaked* lime. The sacks are supplied gratis to the customer—that is, no charge is made for them if they are returned in fair condition when the next load is delivered.

This hydraulic lime, which makes excellent mortar, is usually mixed with three parts, by measure, of sand, though it is a common practice to specify two measures of sand to one of lime. Comparatively very little lime, however, is used in Paris, owing to the practice of employing plaster of Paris, which still prevails almost universally. The plaster seems to stand fairly well even in exposed situations, in consequence of a considerable admixture of lime, which protects it, to a great extent, from the action of the weather. The mixture of lime and clay obtained from the pug mill is very imperfect, and on crushing up the lumps from the kiln they are found to be full of particles of quicklime, many of them as large as peas. The manufacturers admit the incompleteness of the compound made in the pug mill, but content their customers with the assurance that they must have this or nothing, as they cannot prepare a slip in the winter time.

The summer mode of manufacture is precisely similar to that practiced by some of our English Portland cement makers: the chalk and clay are washed together in a mill, which consists of a large wheel rotating in a circular trench. The tire of this wheel is armed with iron spikes, and a considerable quantity of water is used. The chalk and clay are ground under this wheel for from one and a half to two hours; at the end of which time the contents of the mill are reduced to a creamy slip, which is run off into settling ponds or becks to dry. The water gradually evaporates or soaks into the ground, and the creamy mixture when sufficiently consolidated to be dug out, which may take several months, is removed in small cakes to the drying floor, whence in twenty four hours it is ready to be burnt.

The hydraulic lime thus prepared is far more perfectly mixed than it could be by simple dry-pugging, and the quality is much superior to that prepared in the manner we first described. During the winter-time a large quantity of clay is carted into caverns or excavations in the galleries of the quarries, and is there mixed by washing with chalk, in order to dry and become ready for summer use. The advantage of making this mixture in the quarry is that the chalk is so absorbent that the water is very freely sucked away from the slip, and the compound becomes sufficiently dry for use with little or no trouble.

The works at Meudon are those originally founded by M. St. Leger, who was the first maker of hydraulic lime in France under the process described by Vicat. M. St. Leger seems to have patented his process in England, but it does not appear that he ever put his plan in operation here.

Near Paris there are now three manufactories of artificial hydraulic lime on this plan. That of M. Deschamps-Hévin, of the Route des Moulineaux, at Issy, is the most important. The price of the ground hydraulic lime is about 24 francs per cubic meter—say, roughly, 15*s.* per cubic yard.—*Building News.*

Engineers' Club, Philadelphia.

At a recent meeting, Dr. H. M. Chance described an attempt to extinguish the Kehley Run Colliery fire at Shenandoah City, by carbonic acid gas and nitrogen. The gas was generated in an open brick furnace with reversed draught, and forced into the mine through four 3-inch pipes by injectors supplied with steam at 60 lb. pressure. Each pipe was supposed to supply 1,500 cubic feet per minute, or a total of 6,000 cubic feet per minute. The attempt was entirely unsuccessful, and Dr. Chance attributes its failure principally to *the impossibility of making the mine airtight*, but also considers that the gas was delivered at too high a temperature, and that it was possibly mixed with carbonic oxide. The method seems to be worthy of further trial at mines that can be made thoroughly airtight.

Mr. P. H. Baermann described briefly the construction of the Cooperstown, N. Y., waterworks, and particularly the method of laying the supply pipe extending from the pumphouse up the Susquehanna River into Otsego Lake, a distance of 4,500 feet. The pipe was laid from a staging carried on 120 barrels, and lowered in 108 foot sections. Up to 9 feet in depth the joints were made with dry pine wedges, and above this with lead. The end of the pipe is provided with a copper strainer, which is in 38 feet of water and 10 feet above the bottom.

A paper was also read by Dr. Chance on "Wear in Wire Ropes," showing that the cause of rapid wear is often due to the use of drums, sheaves, and pulleys of insufficient size, and that a great saving might be effected by increasing their diameters; especially that of the small deflection and knuckle pulleys and sheaves. The actual wear averages 0·138 cent in slopes, and 0·053 cent in shafts, per ton, for each hundred feet of lift.

A Barber on Baldness.

Speaking of the credulity of many people touching the efficacy of hair tonics, an intelligent French hairdresser says:

Very often the hair falls out after sickness. In such cases it generally grows again without the aid of any hair tonic whatever; but when it falls out from natural causes it never grows again. The celebrated Dr. Bazin, who was formerly physician in chief of the St. Louis Hospital at Paris, and who is known throughout the world as the most learned specialist for affections of the skin, told me one day that there was nothing that could make the hair grow after the baldness had come on gradually. This I believe firmly, for, if there was anything of the kind, we would not see so many New York doctors with heads as completely destitute of hair as the backs of turtles. I am even persuaded that these gentlemen would follow the example of those Greek heroes who, under the leadership of Jason, made a voyage to Colchis to bring back the Golden Fleece. Modern Argonauts, the doctors, would consider themselves happy if they could bring back from such a voyage the secret of restoring the human fleece.

I don't think I am far from the truth when I say that during the past twenty-five years that I have practiced the profession of hairdresser, I have made the trial upon different bald heads of more than five hundred different hair tonics, and I am bound to admit that I never saw a single head the hair of which was restored after baldness. At the end of so many failures, I am completely undeceived as to the value of all the preparations, and I would not now recommend any one of them, because I would be afraid to commit the crime that is designated by the words, "obtaining money under false pretenses." In my pathological studies upon the hair, I have found that people who perspire a great deal from the head are apt to get bald. The bad habit of wearing hats indoors is also very hurtful to the hair. In 1806, after the famous battle of Jena, in which the Prussians were completely defeated by Napoleon I., Baron Larrey, the celebrated military surgeon, perceived that many of the German prisoners were completely bald. Surprised, he made inquiries as to the cause of this, and he found that they owed their baldness to the shape—as homely as unhealthy—of their caps. The foul air of their head gear, having no issue, destroyed the vitality of the hair.

Disinfectants.

Professor Beilstein, who has recently studied the various substances used for disinfection, arrives, in a communication made to the St. Petersburg Technical Society, at the following conclusions: Sulphuric acid would be the best disinfectant if it did not destroy the sides of the tanks; the use of lime and of salts of lime ought to be completely renounced, as they but temporarily destroy bacteria, and under some circumstances may contribute to their development; nor does sulphate of iron, even in a solution of 15 per cent, ultimately destroy bacteria, as they revive when put into a convenient medium. Therefore, Professor Beilstein recommends sulphate of aluminum, which is used in paper and printed cotton manufactures. The best means for providing it is to make a mixture of red clay with 4 per cent of sulphuric acid, and to add to this mixture some carbolic acid for destroying the smell of the matter which is to be disinfected.