passes common air over the proto-chloride of iron at a high temperature, and thus obtains peroxyd of iron and chlorine gas.

*Photography.*—E. Mayall, of London, has obtained a patent for the application and use of a new material in photography, known by the name of "artificialivory." This substance is formed of small tablets of gelatine or glue immersed in a bath of sulphate of alumina, (alum) or the acetate of alumina. A combination takes place between the alumina and glue, and forms the substance for receiving the photograpic pictures, as a substitute for the common metal plates and prepared paper. It is stated that it receives a polish equal to ivory, and the tints of the pictures have an exquisite softness, far surpassing those of the daguerreotype. The process for obtaining pictures is the same as that commonly pursued in photography.

*Artificial Hard Grain of Leather.*—To give any kind of leather the appearance of genuine *hard grain*, J. A. Richards, of London, takes a skin of real hard grained leather, electrotypes it, and then bends the plate thus produced round a roller or drum, and mounts it on a shaft. He then passes the leather to receive the hard grain appearance under this roller, which is subjected to great pressure.

*Preserving Animal Food.*—This subject appears to be attracting great attention abroad at present. We recently (on page 308) gave the description of the process patented by M. Demait, of Paris. The following is exactly similar to M. Demait's, with the addition of a finishing coating of an albumen composition. The meat is cut in pieces and is pressed, to remove all the blood and serum, and then subjected to the fumes of sulphuric acid gas for a few hours. It is then taken out, exposed to the air for a short time, and dipped into a warm composition of animal albumen, some molasses, and a decoction of marsh mallows. This composition covers the meat with a coating, which protects it from the action of the atmosphere. This method of preserving meat has been somewhat extensively tested, and with success, by the French government Meat thus treated, it is said, has been carried from France to Algiers, and back again, and it tasted sweet and pleasant when cooked. A patent for this process was obtained in the name of R. A. Brooman, of the London *Mechanic's Magazine.*

Joseph Hand, of London, has also secured a patent for preserving meat by a process varying but little from the above. It consists in exposing the meat, in a close chamber, to the action of binoxyd of nitrogen, nitrous acid, and sulphurous acid, in a gaseous state, either singly or combined. The specific action of the acid gases is the great feature in all these patented processes. Smoking meat, to render it more preservative, is a very old, common, and well known method. It is the specific action of the pyroligneous acid in the smoke on the meat, which accomplishes the preservative result. The action of the English and French governments in granting recent patents for the application of certain acid gases, or a combination of them, in preserving meat, shows us how liberal they are in encouraging inventors in making improvements, however small, in important and usful processes.

*Still Another.*—M. Martin de Lignac, of Paris, has also been granted a patent for preserving meat. It consists in subjecting raw meat, cut into cubes about an inch square, and subjecting them in close chambers, to currents of warm air at about 75° Fah., until the meat has lost half its weight. It is then powerfully compressed in cylindrical tin boxes to about one-fifth the space occupied before it was dried. The lids of the boxes are then soldered on and a small hole left in the top of each. The boxes are then submitted to a heat of 212°, to raise any moisture in the meat into a steam, when they are soldered up perfectly tight.

### Important Patent Cases.

The following important patent cases were tried during the present term of the United States Circuit Court, held by Judge Betts in New York City:

*Isaac M. Singer and Edward Clarke, versus James Pigot.*—This was an action for an alleged infringement of a patent granted to Morey & Johnson, in 1849, and re-issued to the plaintiffs as assignees, in 1854, for improvements in sewing machines.

The point chiefly in controversy was the right to the use of a device (now generally used in sewing machines,) to hold the cloth to the feeding apparatus by a yielding pressure during the operation of sewing with a machine. This being claimed in the re-issued patent, and not in the original, the defendant set up that the re-issue was too broad to be sustained by the original: that the two were not for the same invention: that in the Morey & Johnson machine there is no patentable combination of the spring pressure with the feeding apparatus: that the claim is equivocal and bad from ambiguity: and that the thing, as claimed, was not new with the patentees, but had been before used and patented by Thimonnier, in 1830 and 1845, in France; and used by Howe in 1845–6, and by Bradshaw, in 1847, in this country.

The trial continued two weeks, and the jury after being out all night, and nearly all day, on Monday, were discharged by the Court, as not being able to agree,—eight being for the defendant and four for the plaintiffs.

Charles M. Keller and A. L. Jordan were for the plaintiffs; and George Gifford, of New York, and Joel Giles, of Boston, for the defendant.

*Alexander Smith and Jonathan Smith versus Alvin Higgins, Elias S. Higgins, and Nathaniel D. Higgins.*—This was a suit for an infringement of a patent granted to Alexander Smith, in 1850, and re-issued in 1852, for apparatus for parti-coloring yarn, by dyeing, by free immersion for ingrain carpets, known as "Tapestry Ingrain Carpets."

The plaintiffs and defendants are both manufacturers of carpets, and the plaintiffs claimed a large amount of damages.

The defendants admitted the novelty of the apparatus, as described, both in the original and re-issued patent, and contended that the same was not infringed by them: that the apparatus employed by them was not invented by the patentee, and that if the re-issued patent be construed so as to cover the defendants' apparatus, then it would be void, first, because it would be a fatal departure from the original patent; and, second, because it would then cover more than what was new with the patentee.

The trial continued for two weeks, and the jury, after being out one day, rendered a sealed verdict for the defendants.

The case was tried by Charles M. Keller and Samuel Blatchford for the plaintiffs, and by George Gifford for the defendants.

### Notes on Patented Inventions.—No. 11.

*India Rubber Manufactures.*—On March 9, 1844, Charles Goodyear was granted two patents, one for shirred or corrugated india rubber goods, and the other for a machine used in making them. The claim for the goods was "Forming them of strips or threads of india rubber, and covering them on opposite sides with lamina of cloth, leather, or other material, and uniting them all together by a cement of india rubber, so as to produce a new manufactured article." The machine patented with the manufactured article, embraced a pair of rollers and an endless belt; the threads or strips of india rubber, with the cloth on both sides, were made to adhere by the cement, when passed between the rollers. There was also a stretching frame combined with the rollers, for preserving the strips or threads of india rubber at the required distances apart.

On the 15th of June following, Chas. Goodyear obtained his great patent for vulcanizing india rubber. This embraced mixing the india rubber with sulphur and carbonate of lead, and submitting the compound to a heat of about 270° Fah. The white lead and the subjection of the compound to this heat, are the new features of this invention; the sulphurization was the discovery of N. Hayward.—This new process of Mr. Goodyear was a very great improvement upon his old one of tanning the surfaces of such fabrics by the use of a metalized acid. The high heat to which the compound was subjected promoted the chemical union of the sulphur with the india rubber, and formed a vastly superior and improved fabric to any previously manufactured—it was real vulcanized india rubber. In a trial which took place in England in June, 1854, for an infringement of Hancock's patent for vulcanizing india rubber by the sale of American india rubber shoes, Mr. Goodyear gave evidence that he had invented the above improvement in 1842, and sent an agent to England to endeavor to sell the secret. He, however, committed the great oversight of not securing a patent in that country before he exhibited his samples to Mr. Macintosh, and his foreman, M. Hancock.—Hancock did not purchase Mr. Goodyear's invention, and smelling sulphur in the samples he set to work experimenting and discovered the process for himself. It has been stated, however, that while Mr. Goodyear had only used a high heat in a warm chamber to vulcanize his goods, Hancock was the first to use steam for the purpose, which is a superior method.

We have now arrived at the grand focal point in the history of india rubber manufactures—the invention of vulcanization, or that property imparted to it, by which it is rendered permanently elastic, not easily affected with acids or alkalies, and which enables it to withstand all changes of atmospheric temperature. This invention is one of the most important ever discovered, and the credit of it is due to America.

By a calm investigation of the subject, the evidence we have examined completely ignores the claims of Hancock of England, as the first inventor. But the invention of vulcanized india rubber is not, as we have shown, the work of one mind, nor the result of a lucky stray thought, it is a discovery of growths as it were. Hayward discovered the sulphurization process, then some years afterwards Goodyear discovered the heating process; both are required to produce vulcanized india rubber.

Since this discovery the application of the substance to an almost endless variety of manufactures is one of the most enterprizing evidences of its useful and adaptable character. Quite a number of patents have been received for such manufactures, but they are all subordinate, and of minor importance to the producting of the vulcanized material, the patent for which will not expire June, 1858.

Henry G. Tyre and J. Helm, of New Brunswick, obtained a patent for an improved machine for cutting threads of india rubber for shirred goods in Oct. 1844; and in the same month Horace H. Day obtained a patent for a machine for stretching the threads of india rubber, and facilitating the manufacture of such goods.

In April, 1845, Nelson Goodyear, of Newton, Conn., secured a patent for combining india rubber with grit, iron, and other metal filings.

In May succeeding he also secured a patent for combining india rubber with fibrous materials, like silk and wool, to give solidity and tenacity to india rubber fabrics, and to make them firm and solid with a smooth surface like leather.

On the 5th of July succeeding, Charles Goodyear obtained a patent for combining stocking-knit cloth with sheets of india rubber, thus producing a new water-proof fabric, which, we believe, has not since been manufactured.

In the same year Horace H. Day, J. Helm, and H. G. Tyre secured a patent for an improvement in machinery for cutting threads of india rubber, and James Bogardus, of New York, obtained a patent for another machine for the same purpose.

On April 17th, 1847, William Ely, of New York, secured a patent for vulcanizing india rubber without the use of sulphur, substituting for it, calcined, or the carbonate of magnesia mixed with india rubber, and submitting the compound to steam heat. We do not know if this compound is equal to a sulphur compound or not; but the two are essentially different in their nature.

In June following J. Gilbert and G. Gay, of New York, obtained a patent for treating india rubber, embracing no less than seven claims, covering the use of sulphurizing india rubber with the fumes of sulphur, as a substitute for flower of sulphur. Also for exposing the fabrics to the action of dry air combined with steam, to remove the clamminess from them. Some arrangements of the machinery were also claimed.

In September following, James Thomas, of New York, also obtained a patent for sulphurizing india rubber with a sulphur acid, preferring a hypo-sulphite, or a mixture of hypo-sulphite with sulphuret of lead. These two patents seem to be designed to obviate the one embracing the simple use of flour of sulphur. The improvement is questionable.

In April, 1848, C. Goodyear secured a patent for making india rubber balloon articles, such as balls, in a different manner from that secured by E. Chaffee in a previous patent.

On the same date Charles F. Durant obtained a patent for dissolving india rubber with perchloride of formyle.

In January, 1849, H. G. Tyer and J. Helm, of New Brunswick, N. J., were granted a patent for the use of salts of zinc as a substitute for white lead in india rubber compounds containing sulphur. As Patrick Mackie had obtained a patent, in 1834, for the use of sulphate of zinc, it appears to us that as his patent has expired, its use is now public property connected with india rubber.

This subject will be concluded next week.

### Does the Moon Rotate on her Axis.

Since we published a short article, on page 320, stating that the common accepted theory of the moon rotating on her axis once in 28 days, was disputed in England by J. Simonds, Inspector of Schools, and others, we have received a number of communications with diagrams to illustrate how it does rotate once in the time specified. All these communications prove exactly what their authors intend they should, but they are not proper answers to the question in dispute. By the moon rotating on her axis once during her sideral revolution round the earth, she must present the same face to one fixed point of the earth, but not the same face to every portion of the earth. It is asserted by those who dispute the axial rotation of the moon, that, like the ball of a governor on the steam engine, continually revolving, but not rotating and showing the same face to its shaft, so the moon always shows the same face to every part of the earth. Is this so? That is the question. It can easily be determined by observation at different points of the earth's surface. If photographs were taken of the moon's disk in England and America, and compared together and examined by a microscope, the dispute, we conceive, would soon be settled. In the meantime those who deny the moon's rotation, assert that the theory of its rotation in about 28 days, was invented to account for seeing the same face of the moon, from only one fixed point of the earth, and that in Europe.

Every observer of the moon has noticed that it always presents—very nearly—the same face towards us. This is accounted for by allowing her to make but one rotation on her axis, during her single revolution round the earth. But these periods are not exactly equal, for the time of the moon's revolution, is subject to small irregularities whereby we sometimes see a little more of one of its edges than usual either on the eastern or western sides of her equatorial regions. This is called the moon's *libration*, and is also claimed by those who dispute her axial rotation, as favorable to their view of the question. It would be an anomaly, however, in the motions of the bodies in our solar system if the moon possessed no axial rotation; therefore reasoning *a priori*, we would conclude it had such a motion. Deductions, however, must never be allowed to stand fo facts in science, the soul of which is, correct observation.

### New Polishing Powder.

Mix equal quantities in solution of oxalic acid and sulphate of iron, then dry the precipitate, calcine it, and use it in fine powder. It is superior to lixivated colcothar for polishing optical glasses, and fine metal work.

### Electro-Chemical Baths.

An article on this subject by Prof. Vergnes—the inventor—will appear in our next number.