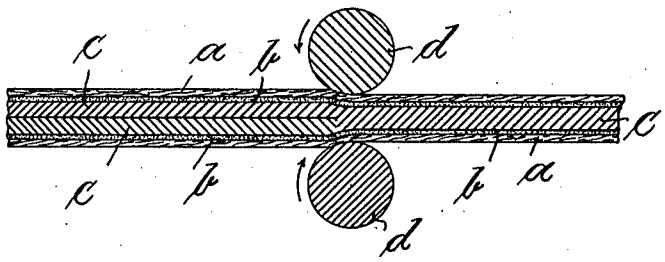
O. MOH.

GELATIN FILM.

APPLICATION FILED MAY 14, 1906.

953,175. **Patented Mar. 29, 1910.**



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UNITED STATES PATENT OFFICE.

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GELATIN FILM.

953,175. Specification of Letters Patent. Patented Mar. 29, 1910.

Application filed May 14, 1906. Serial No. 316,684.

To all whom it may concern:

Be it known that I, OSWALD MOH, a subject of the King of Prussia, German Emperor, and resident of Flörsheim, in the Province of Hesse-Nassau, German Empire, have invented certain new and useful Improvements in Gelatin Films, of which the following is an exact specification.

The present invention relates to a new process by means of which films of gelatin are produced to be employed for various purposes but in particular in the photographic art.

In the preparation of photographic films gelatin dipped in a suitably prepared nitrocellulose has been used but such a process is neither economical nor effective and it is the object of the present invention to provide an improved process for producing a film suitable for photographic and other purposes.

The invention consists in the following: A layer of gelatin is put on paper with a layer of collodion between and two such compound layers, while still moist are united by pressure in such a manner, that the two gelatin layers come next to each other, while the paper sheets form the outer layers on each side. One or both of these outside paper sheets may be removed as soon as the whole preparation is dry. In this manner a film is produced, the center layer of which consists of gelatin covered on either side with a coating of nitro-cellulose. The product obtained has all the advantages of a glass plate, it neither warps nor is it subjected to strains and it is tough and light. If the layers are of a sufficient thickness, the paper sheets on either side are removed at once, that is, before the film is used, but if for some reasons thin layers of gelatin are required, only one of the paper sheets is removed. Such conditions, for instance, arise, if the film is to be used for the making of photographic plates, in which case the one side is to be covered with a sensitive layer. The second paper sheet remains, until the negative is finished and ready for printing purposes, when it is removed.

I shall now describe a process of carrying this invention into effect, by way of example with reference to the accompanying drawing, which diagrammatically illustrates this process.

In the first place I select a compact non-porous paper—very smooth parchment paper is preferred—which paper I cover on the one side with a layer of nitro-cellulose. In order to make the nitrocellulose adhere to the paper, I use collodion mixed with a very small percentage of a neutral soap, such as for instance: .01% of sapo-medicatus. The addition of soap serves the purpose of facilitating the ultimate removal of the paper. On top of the layer of nitrocellulose a layer of gelatin is poured. Prior to this the gelatin is mixed with a suitable substance, such as salts of chromium for instance, for the purpose of obtaining an almost insoluble gelatin in the finished product, that is after drying. The addition of a little medical soap to the gelatin mass renders the latter somewhat elastic and I prefer this addition to that of glycerin hitherto used for that purpose, inasmuch as the latter product makes the gelatin hygroscopic. In order to prevent the gelatin becoming opaque by this addition of medical soap, the latter is preferably dissolved in alcohol instead of water before using. As soon as the gelatin layer, produced in the manner described, is in a half dried state, (*i. e.* slightly moist), I take two of such prepared paper gelatin sheets and place them on top of each other, as shown in the drawing, where *a* denotes the paper backing, *b* the nitrocellulose layer and *c* the gelatin. The gelatin layers as can be seen are next to one another and the paper sheets outside. I then pass them through rollers *d*, *d*, where they are pressed, so that the sheets are united and are allowed to dry. Either one or both paper sheets are now removed. Films produced in this manner can be used for different purposes. If to be employed in the photographic art, one side of the film is coated with an emulsion of bromid of silver in the same manner as a glass plate would be treated. Films employed for diapositives or for a positive photographic printing process can also be made in this way. The product may also be used with advantage as a substitute for glass plates and especially to take the place of films made of celluloid. I may for instance employ two large rolls of paper, of which the continuous paper strips, as they roll off, are both treated in the same manner as the single sheets mentioned above and these two strips being properly guided and with their

gelatin layers in contact are finally conducted under roller presses in order to be united into one strip, which for the matter of convenience I may roll up again on another roll. In this way I obtain a rolled up continuous strip, of the same structure as the single sheet treated and united in the same manner as described before.

Having thus fully described the nature of my invention, what I desire to secure by Letters Patent of the United States is:—

1. A process for the manufacture of films, consisting in applying a coating of nitro-cellulose to one side of a compact non-porous sheet of paper, applying a coating of gelatin over said nitro-cellulose, preparing a second sheet of paper in a similar manner, laying said sheets of paper over one another with their coated sides facing and while the continuous gelatin layers are somewhat moist, uniting the layers by pressure and subsequently drying the compound layer and removing the outer paper, as desired.

2. A process for producing a film for photographic and like purposes comprising covering a parchment sheet with nitro-cellulose having a small addition of sapo-medicatus added thereto, placing a layer of gelatin mixed with salts of chromium over said nitro-cellulose layer, uniting two such paper gelatin layers by pressure before the gelatin layers are thoroughly dried and with said layers contiguous, drying the compound film thus produced and removing as desired the parchment backing, substantially as described.

3. A process for producing a film for photographic and like purposes comprising covering a parchment sheet with nitro-cellulose having a small addition of sapo-medicatus added thereto, placing a layer of gelatin mixed with salts of chromium over said nitro-cellulose layer, uniting two such paper-gelatin layers by rolling the same together before the gelatin layers are dried and with said layers contiguous, drying the compound film thus produced and removing as desired the parchment backing.

4. A process for producing a film for photographic purposes consisting in covering the paper passed from a roll on one side with nitro-cellulose having a small addition of sapo-medicatus, placing a layer of gelatin over said nitro-cellulose layer, uniting said prepared strip by pressure with a similarly prepared strip before the gelatin layers are dried and while said layers are contiguous, subsequently drying and removing as desired the paper backing and coating the film so obtained with an emulsion of bromid of silver, substantially as described.

In witness whereof I have hereunto set my hand in the presence of two witnesses.

OSWALD MOH.

Witnesses:

WOLDEMAR HAUPT,

HENRY HASPER.