

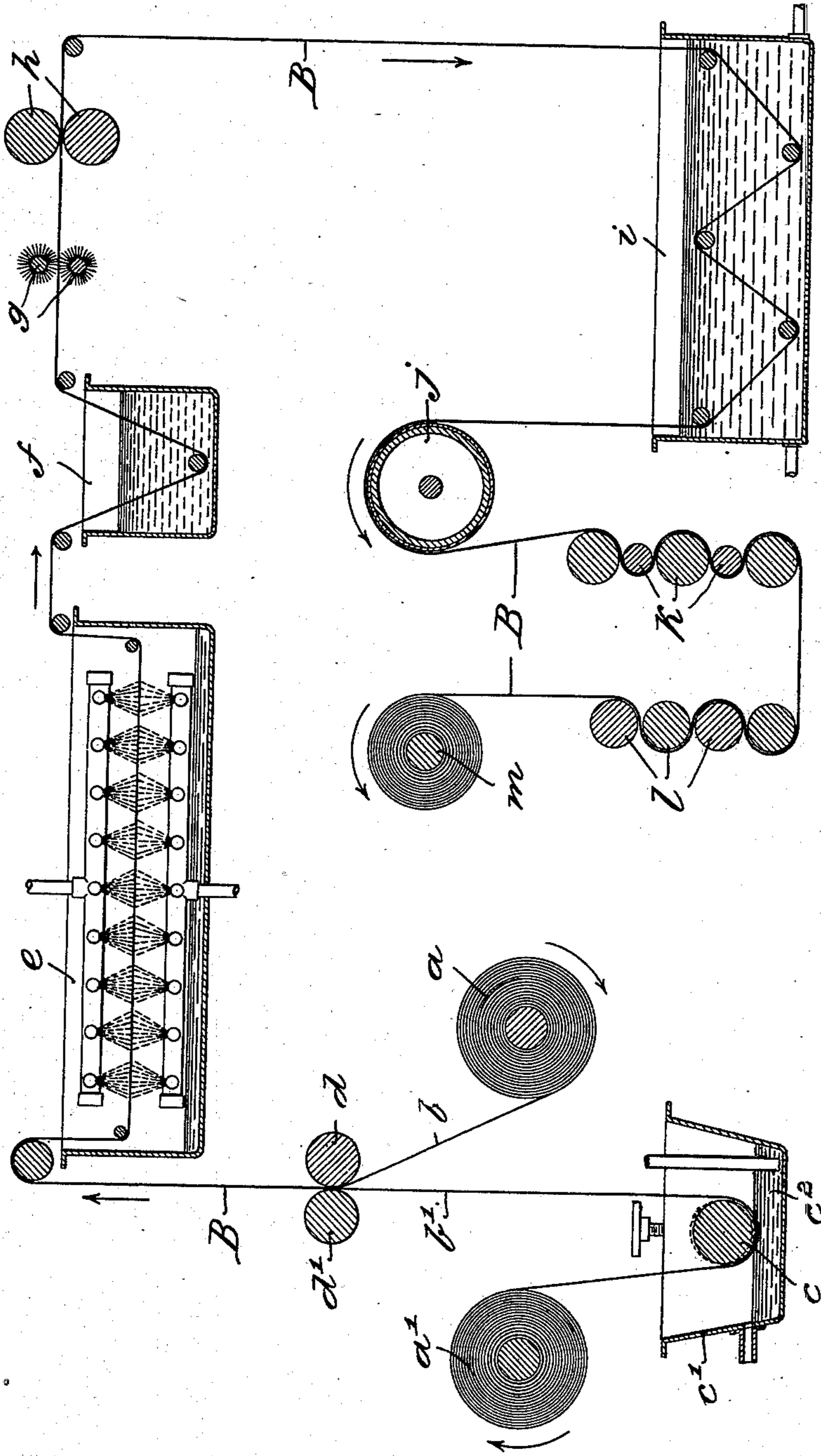
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Patented Dec. 2, 1902.

G. S. & C. FALKENSTEIN.  
MANUFACTURE OF ARTIFICIAL LEATHER.

(Application filed Mar. 7, 1902.)

(No Model.)



Witnesses:  
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# UNITED STATES PATENT OFFICE.

GEORGE S. FALKENSTEIN AND CHARLES FALKENSTEIN, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNORS OF ONE-HALF TO OTTO WOLFF AND ALFRED D. WILER, OF PHILADELPHIA, PENNSYLVANIA.

## MANUFACTURE OF ARTIFICIAL LEATHER.

SPECIFICATION forming part of Letters Patent No. 714,791, dated December 2, 1902.

Application filed March 7, 1902. Serial No. 97,043. (No specimens.)

*To all whom it may concern:*

Be it known that we, GEORGE S. FALKENSTEIN, a subject of the Emperor of Germany, and CHARLES FALKENSTEIN, a citizen of the United States, both residing at the city of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have jointly invented certain new and useful Improvements in the Manufacture of Artificial Leather, of which the following is a specification.

Our invention has relation to the manufacture of artificial leather; and in such connection it relates to an improvement upon the method of making artificial leather described and claimed in Letters Patent No. 667,770, granted to us on the 12th day of February, A. D. 1901.

In the method described in our former patent a sheet of textile material forming the backing and a sheet of matted or felted cellulose material forming the facing of the material are both drawn initially through an acid-bath and both treated therein to a mixture of sulfuric and muriatic acid. While for general purposes this method has been found to give good results, yet in the imitation of certain thin or enameled leathers it has been found that the treatment of both face and back to the acid solution will not give the best results in producing the artificial leather required.

The object of our present invention is to improve the method of our former patent, whereby certain required leathers may be more successfully imitated than was possible in our former method.

To accomplish this method, the invention consists, primarily, in subjecting but one of the sheets—namely, the facing—to the action of the acid-bath and the uniting of the treated facing to an untreated backing by pressure while the facing is still moist or wet by the acid solution. An additional feature of our present invention comprises an arrangement of the bath in which the facing is treated so that if required the facing-sheet may be either more or less saturated with acid or only dampened on one side of the facing-sheet.

The nature and scope of our invention will be more fully understood from the following

description, taken in connection with the accompanying drawing, forming part thereof, and illustrating diagrammatically a preferred form of apparatus for the conduct of the method of our present invention.

Referring to the drawing, *a* and *a'* represent rolls of material to constitute the backing *b* and facing *b'* of the sheet B, which after treatment as hereinafter described becomes artificial leather. The backing *b* is preferably a textile material—such as cotton, linen, canton-flannel, or the like—and the facing *b'* is also a textile material, more or less closely woven, such as cotton, muslin, sateen, or the like. The facing *b'* passes from the roll *a'* beneath a roll *c*, rotating in a tank or vat *c'*, containing an acid bath or mixture *c<sup>2</sup>*, consisting of two-thirds of sulfuric acid to one-third of muriatic acid, more or less. The roll *c* is adjustable in the tank *c'*, so that its periphery may either be entirely submerged in the acid mixture *c<sup>2</sup>* to submerge the facing *b'* or may just touch the upper surface of the bath *c<sup>2</sup>*, so that the facing *b'* is moistened on only one of its sides. When the facing *b'* is of thin material, it will be found desirable to moisten but one of its sides, whereas if it is of thick material it may be necessary to completely submerge the facing *b'* in the bath *c<sup>2</sup>*. The facing *b'* after it leaves the bath *c<sup>2</sup>* passes in a moist condition between two squeeze or pressure rollers *d* and *d'*, and at this point the backing-sheet *b* is united to the facing by the combined action of the acids and the pressure of the rolls *d* and *d'*, the two sheets *b* and *b'* emerging from the pressure-rolls *d* and *d'* in a single sheet B, the face of which is leathery, whereas the back is either slightly or not at all leathery. In either instance the back is still of a tough nature, not easily torn, since its textile structure is not completely destroyed by the action of the acids under pressure of the rolls *d* and *d'*. The sheet B now passes preferably through a washing-tank *e*, in which it is sprayed and washed by water containing a certain proportion of soda or ammonia, so that the free acids are washed out, leaving no trace in the sheet B. The washed sheet B now passes through a sizing-tank *f*, in which its leather-like face and its

back are filled with a solution of preferably thirty parts of glycerin, one hundred parts of linseed-oil, ten parts of flour, and five parts of "degras," more or less. The sheet B is  
5 permitted to absorb a sufficient quantity of filler to render its face soft, pliable, and pulpy. It is then passed between brushes *g* and squeeze-rolls *h* to remove superfluous filling material. The filled sheet B now  
10 passes into a drying-vat *i* and thence over a heated roll *j* and through a series of calendering-rolls *k* and goffering or graining rolls *l* and finally wound upon the lay-up roll *m* ready for use as a substitute for leather.  
15 By causing the two sheets *b* and *b'* to unite under the action of the acids combined with pressure a more homogeneous structure and one better adapted for the subsequent operations to convert it into artificial leather is  
20 obtained than where each separate sheet is parchmented and thereafter united by a layer of glue, dextrine, or the like. Where such layer of glue, &c., is used, the sheet becomes brittle and cannot be given that pulpy  
25 appearance and nature which is requisite in a successful imitation of leather.

Having thus described the nature and object of our invention, what we claim as new, and desire to secure by Letters Patent, is—  
30 1. The improvement in the art of making

artificial leather, which consists in first subjecting a facing of more or less closely-woven textile fabric to a bath of combined sulfuric and muriatic acids, and thereafter subjecting  
35 the treated facing and an untreated textile backing to pressure while the facing is still moist to thereby cause the two textiles to unite into a homogeneous sheet under the combined action of the acids and of pressure.

2. The improvement in the art of making  
40 artificial leather, which consists in first subjecting one side of a facing of more or less closely-woven textile fabric to the action of a bath containing sulfuric and muriatic acids in about the proportions stated, then cover-  
45 ing the moistened side of the facing with an untreated textile backing and thereafter subjecting both facing and backing to pressure while the facing is still moist to thereby cause  
50 the two textiles to unite into a homogeneous sheet under the combined action of the acids and of pressure.

In testimony whereof we have hereunto set our signatures in the presence of two subscribing witnesses.

GEORGE S. FALKENSTEIN.

CHARLES FALKENSTEIN.

Witnesses:

J. WALTER DOUGLASS,

THOMAS M. SMITH.