

UNITED STATES PATENT OFFICE.

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RAPID-TANNING PROCESS.

SPECIFICATION forming part of Letters Patent No. 694,034, dated February 25, 1902.

Application filed March 24, 1900. Serial No. 10,070. (No specimens.)

To all whom it may concern:

Be it known that I, KARL FRITZ FRANZ GOTTLIEB SOMMER, a citizen of Germany, residing at Hamburg, in the Empire of Germany, have invented certain new and useful Improvements in Rapid-Tanning Processes, (for which I have applied for patents in England, dated February 20, 1900; in Sweden, dated February 17, 1900; in Norway, dated February 17, 1900; in Denmark, dated February 15, 1900; in France, dated February 21, 1900; in Belgium, dated February 21, 1900; in Austria, dated February 15, 1900; in Germany, dated February 13, 1900; in Hungary, dated February 23, 1900, and in Italy, dated February 22, 1900,) of which the following is a specification.

The invention relates to the process of rapid tanning of leather, particularly the kind used for the manufacture of "uppers" for shoes, and has for its object the complete tanning of fresh skins—such as have been depilated by the use of lime, for instance—in a very short time—say about two and one-half hours—without the application of heat, so that the skins or leather after drying and finishing are ready for the shoemaker.

This process consists of the use of picric acid, to which is added hydrochloric acid, in tanning by the chromic-acid method, and of the after treatment of the hides by hydrosulfurous salts (such as hydrosulfite of sodium or hydrosulfite of lime) and hydrochloric acid. By the term "hydrosulfurous salts" I mean those which are also known by the designation of "thiosulfates." By the addition of picric acid to the substances used in the chromic-acid process of tanning the leather is greatly improved. In the chromic-acid process the inner skin or fiber of the leather contracts and the leather as a whole becomes contracted, while by the addition of picric acid the leather is kept soft and is rendered more durable. In all, there are seven baths employed—namely, first, a bath of picric acid and water; second, a bath of pure water; third, a bath of potassium, bichromate, alum, sodium chlorid, picric acid, and water; fourth, the same as bath 3, to which hydrochloric acid is added; fifth, a bath of hyposulfite of sodium and cold water with hydrochloric acid; sixth, a more concentrated bath

of hyposulfite of sodium, water, and hydrochloric acid, and seventh, a bath of ammonia.

I will now proceed to describe how this process is carried out, for instance, in tanning two sheep-skins about two pounds in weight.

The skins, prepared in the same manner as for the usual chrome tanning, are moved to and fro for about one-half hour in a solution in the proportion of about twenty-five grams of picric acid to eight liters of water. The pores of the skin are thus opened, and the latter is rendered more suitable for the reception in liquids in the subsequent processes. For the purpose of removing any foreign liquids from the skins they are moved for about five minutes in a bath of cool water and then for about twenty minutes in a bath made as follows: A solution is formed consisting of two hundred and forty grams of bichromate of potassium, two hundred and twenty grams of alum, one hundred and twenty-five grams of sodium chlorid, and three liters of hot water. When a perfect solution has been effected, four liters of cold water and three-fourths of a liter of a solution of twenty-five grams of picric acid and eight liters of water are added. The whole is then allowed to cool. The skins are then removed from the bath, and twenty-five grams of hydrochloric acid of 1.159 specific gravity are added. The skins are then introduced again and moved for about forty-five minutes in the bath, so that the solution will act on all parts of the skin, after which the skins have become tanned—that is, the skins have become impregnated with the tanning agents—so that the subsequent treatment is only designed for the purpose of preventing the action of the acids from proceeding too far. After the skins have been removed from the above bath and have been cleaned on the fleshy side by frictional rubbing on the surface with a suitable tool, such as is ordinarily used for this purpose, to remove the liquid or chemical substances dissolved therein the skins are drawn through a bath consisting of a solution of one hundred and twenty-five grams of hyposulfite of sodium in five liters of cold water and ten grams of hydrochloric acid of 1.159 specific gravity. The skins are then hung up for some minutes to

allow the liquids to drain off. The skins are then moved strongly for an hour in a bath consisting of a solution in the proportion of two hundred and fifty grams of hyposulfite of sodium to eight liters of hot water, to which
5 are added ninety grams of hydrochloric acid of 1.159 specific gravity. The skins are then washed in lukewarm water to which has preferably been added ammonia of 0.895 specific
10 gravity to neutralize the acid, to render the acids present non-injurious, and to render the skins more receptive to dyes. The skins are then cleansed again, the superfluous liquids removed, and the smoothness of the inner
15 skin is then improved.

The stated proportions of quantities may be varied in accordance with the condition of the skins.

Having described my invention, I claim—
20 1. In the tanning process, the process which consists in treating the skins in a bath containing chrome and picric acids, substantially as described.

2. In the process of tanning, the subprocess
25 ess which consists in tanning the skins with a bath of potassium bichromate, sodium chlorid, alum and water, substantially as set forth.

3. In the process of tanning, the treatment
30 of the skins in a bath of picric acid and water, and then in a bath of potassium bichro-

mate, sodium chlorid, alum and water, substantially as set forth.

4. In the process of tanning, the treatment of the skins in a bath of picric acid and water, then in a bath containing potassium bi-
35 chromate and picric acid, and then in a bath of potassium bichromate, picric acid, and hydrochloric acid, substantially as and for the purposes set forth.

5. In the process of tanning, the treatment
40 of the skins in a bath of picric acid and water, then in a bath of potassium bichromate, sodium chlorid alum and water; and then in a bath of potassium bichromate, sodium chlorid alum, water and hydrochloric acid, after
45 which they are treated in a bath of hydrochloric acid and hyposulfite of sodium, substantially as and for the purpose set forth.

6. In the process of tanning, the subprocess
50 ess which consists in treating the skins with a bath of picric acid and water, then in a bath of potassium bichromate, sodium chlorid, alum and water, then with ammonia, substantially as and for the purpose set forth.

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

KARL FRITZ FRANZ GOTTLIEB SOMMER.

Witnesses:

E. H. L. MUMMENHOFF,
AUGUST LÜHRS.