

UNITED STATES PATENT OFFICE.

SAMUEL MILLAR AND CHARLES E. MILLER, OF GLASGOW, SCOTLAND.

PROCESS OF TREATING AND TANNING HIDES OR SKINS.

SPECIFICATION forming part of Letters Patent No. 614,057, dated November 8, 1898.

Application filed July 24, 1897. Serial No. 645,777. (No specimens.)

To all whom it may concern:

Be it known that we, SAMUEL MILLAR and CHARLES E. MILLER, subjects of the Queen of Great Britain and Ireland, and residents of Glasgow, Scotland, have invented a certain Improved Process of Treating and Tanning Hides or Skins, of which the following is a specification.

This invention has for its object the treating and tanning of hides and skins in an improved, expeditious, and economical manner; and it consists mainly in the application of a solution of formic aldehyde known commercially as "formalin."

The operations constituting the improved process may be varied in practice to suit various qualities and conditions of the hides and skins and to adapt the leather produced for various purposes. Our invention may, however, be practically carried out in the following manner with good results.

In the case of hides or skins which have been unhaired by means of lime or otherwise we subject them, as usual, to weak sour liquors for about four days or until the lime has been completely removed and the pelts have become swelled and plump. We next steep the hides or skins for from twelve to thirty-six hours in a weak solution of formalin. This solution contains one gallon formalin of ordinary commercial strength (forty per cent. formic aldehyde) in eight hundred to twelve hundred gallons water, and one and one-half to two gallons formalin will be sufficient for fifty hides of an average green weight of about eighty pounds each. The sufficiency of the action of the formalin may be tested from time to time by cutting off a small piece and boiling it in water for about two minutes, the hide remaining pliable and tough when it has been thoroughly acted upon.

By the treatment with formalin the hides or skins have their power of absorbing tanning substances quickened and increased, while their liability to lose substance by decomposition or otherwise in the tanning liquors is much diminished.

The process of tanning the hides or skins is much shortened in consequence of the pre-

vious treatment with formalin. The tanning may occupy from thirty hours to thirty days, according to the particular process adopted. If the tanning is assisted by mechanical appliances arranged to keep the hides or skins or the tanning liquor in motion, the duration of the process may be reduced to a few hours. Good results are got by suspending the hides or skins (after the treatment with formalin) in a fresh tanning liquor of 14° Twaddell and keeping the strength of the liquor up to that point during the first week, and then raising the strength to 16° or 18° for about one week more, with which treatment the hides or skins will be thoroughly tanned. After the treatment with formalin hot tanning liquors may be used with freedom without destroying the fiber, and the use of hot liquors shortens the process. The weight of leather produced is more than by the ordinary process, as the hides or skins are perfectly preserved and decomposition prevented. There is also a great saving in the tanning substances used, as the hides or skins quickly absorb them from the liquors while these are fresh and strong and before they have time to ferment or decompose.

The process may be modified by treating the hides and skins at once in a tanning liquor to which formalin has been added—about two gallons formalin for fifty hides of an average weight of eighty pounds.

The process is applicable with equal advantage when the hides or skins are to be finished without removing the hair, wool, or fur.

Leather made by the improved process is suitable for dressing purposes, for machine-belted, for harness, for sole-leather, and other uses for which similar properties are desirable.

For some purposes the hides or skins may be subjected to the tanning liquors only so long as for the tanning action to penetrate partially and not completely through the material. Leather thus produced will dress so as to be pliable and mellow and will be of comparatively light weight.

We do not herein lay claim, broadly, to the process of tanning which consists in subject-

ing the skin to be tanned to the action of formaldehyde, as we are not the first inventors of such process.

What we claim is—

- 5 The process of tanning consisting in submitting hides or skins, after the lime or other substance used in preparing them for tanning has been thoroughly removed, to a solution of formalin, said solution consisting substantially of one part commercial formalin to one
10 thousand parts of water, then submitting said

hides to other tanning liquors until thoroughly tanned, substantially as and for the purpose set forth.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

SAMUEL MILLAR.

CHARLES E. MILLER.

Witnesses:

EDMUND HUNT,

DAVID FERGUSON.