

UNITED STATES PATENT OFFICE.

THOMPSON HANNA, OF KENNEBUNK, MAINE; ADDISON E. HALEY ADMINISTRATOR OF SAID THOMPSON HANNA, DECEASED.

PROCESS OF MANUFACTURING PARCHMENTIZED PAPER-BOARD.

SPECIFICATION forming part of Letters Patent No. 510,424, dated December 12, 1893.

Application filed December 6, 1892. Serial No. 454,271. (No specimens.)

To all whom it may concern:

Be it known that I, THOMPSON HANNA, of Kennebunk, in the county of York and State of Maine, have invented a new and useful
5 Improvement in Processes of Manufacturing Parchmentized Paper-Board, of which the following is a specification.

My invention relates to that class of manufactures known to the trade as "leatheroid,"
10 "vulcanized fiber," and other coined names, which are made by treating cellulose (usually in the form of paper) with chloride of zinc, sulphuric acid, or other parchmmentizing agents; and in referring to any of such products I refer to all, and in using the word "paper" I
15 refer to cellulose whether in the form of paper or otherwise.

One object of my invention is to obtain a more efficient action of the chemicals used in
20 such manufacture upon the paper being treated than is practicable by former methods.

A second object is to get a uniform action of the chemicals through the thickness of the board and prevent the excessive action of the
25 same in its center as is the case with the present methods.

The present method of manufacturing leatheroid, and similar parchmmentized products, when composed of more than one thickness of paper, is to pass paper (usually from
30 a roll) through a bath of parchmmentizing liquid and, after removing as much of the liquid as is practicable by pressure, to wind the paper continuously around a roll until the desired thickness is obtained, then to remove
35 the tube thus formed either as a tube, or (by cutting it lengthwise) as a flat sheet, and either soak out the chemicals in pure water or neutralize them in a bath of some alkaline
40 or other neutralizing liquid. The serious objection to this process is, that the method of soaking out the chemicals requires a long time, sometimes several weeks, especially if the sheets are of much thickness, and the continued and varying action of the chemicals
45 in the center of the thickness of the sheets before they can be removed by the water is uncertain and often harmful.

In the above described process it is necessary to wind the treated paper on a roll, or

press the layers together before it is brought in contact with water; for as it comes from the treating bath, the paper is plastic and sticky, and the layers will readily unite and make a homogeneous sheet; but after the sheet
55 is brought in contact with water, the surface is hardened so that the layers will not readily unite by ordinary means of pressure and heat. When a thick sheet of many layers is placed in water, it takes a long time for the water
60 to reach the center of the sheet, and before that is accomplished, the continued action of the chemicals creates more or less heat, and generates a gas which separates the layers, and makes what is known among manufacturers as "blisters," which are a hinderance
65 to the successful manufacture of thick sheets. Therefore, another object of this invention is to remove the chemicals from the paper before it is wound up in layers to make the thick sheets, or boards, thus overcoming the objections
70 above recited, and still have a single thickness of paper, with such a plastic or sticky surface that the board may be effectually formed.

I secure the objects of this invention as above recited by the use of different degrees of acid strength.

I use the following methods of carrying out my invention, first, to obtain a more efficient
80 action of the chemicals used. It is well known that the combination of water with acids used in parchmmentizing paper creates heat, and that when a sheet of paper is saturated with a compound, sufficiently strong to parchmmentize
85 it, and is put into water, the first result is to create heat. In a single sheet this heat is so quickly cooled that no perceptible damage is done, but if the sheet is wound up and a thick sheet or board is made before it is put
90 into water, it takes considerable time to overcome the heat, and during this time there is more or less injury done to the sheet, and the gas above mentioned is formed and has its damaging effect. I have found that if paper
95 is saturated with a strong parchmmentizing compound, say 50° to 60° Baumé, and then placed in a bath of the compound of less strength by a few degrees, not much heat is engendered, but that the strong compound
100

in the paper is almost instantly reduced to the strength of the weaker, and if the paper is then put into a bath still weaker, the same action takes place, and that by the use of several baths of gradually reducing strength, one half or more of the strength of the acid may be removed before the thick sheet is formed, and in a great measure the trouble of putting the strongly saturated sheet into water is overcome. I therefore use a series of two or more baths of different degrees of strength, passing the paper in the well known way successively from the strongest to the weakest and then winding up on the roll. I do not require any different machine from what is ordinarily used, except to simply add one or more duplicates of the bath box that contains the chemicals.

I do not confine myself to any particular arrangement of baths, any definite number or to any exact strength in either. I change and arrange all these details according to the paper used, and the result desired.

While I prefer a number of baths of graduated strength as above described, I do not confine myself to such, or to the exact process I have described as preferable. While I prefer a compound with a base of sulphuric acid, I do not confine myself to that, but will use under some conditions a compound with a base of chloride of zinc, or any other compound that will parchmentize the paper.

In another application of Addison E. Haley, administrator of the estate of Thompson Hanna, filed April 8, 1893, No. 469,608, which is a division of this case, is described and claimed a process which is apparently the reverse of the process herein described and claimed, but the two processes are used upon and are essential to the proper parchmentization of, different grades and qualities of papers, and the

results produced thereby are essentially different as follows: The process herein described is used in manufacturing thick boards from thin soft paper, and effectually prevents the excessive action of the chemicals at the center of the board, which often occurs in making such boards in the manner heretofore practiced, while the process described in the application before cited is used upon, and is essential to the proper parchmentization of thick and hard paper in order to insure the complete parchmentizing of the center of said sheet as set forth in said other application.

It is obvious that there are a great variety of combinations that can be made with the materials and arrangements described and all will be within the scope of my invention, and I do not limit it to any definite and exact portions or arrangement, but

I claim—

1. The process of manufacturing parchmentized paper by passing paper through two or more baths of parchmentizing liquid of gradually diminishing strength, substantially as and for the purpose herein specified.

2. The process of manufacturing parchmentized paper boards by passing paper through a plurality of baths of parchmentizing liquid of gradually diminishing strength and then uniting several layers of the paper by pressure to form the required thickness.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 28th day of November, A. D. 1892.

THOMPSON HANNA.

Witnesses:

C. W. GOODNOW,
EMERY ANDREWS.