

UNITED STATES PATENT OFFICE.

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BY MESNE ASSIGNMENTS, TO PILGRIM PAPER COMPANY, OF NEW
YORK, N. Y., A CORPORATION OF MAINE.

METHOD FOR THE PRODUCTION OF HALF-STUFF FROM PEAT-TURF.

No. 836,069.

Specification of Letters Patent.

Patented Nov. 13, 1906.

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No. 84,457. (Specimens.)

To all whom it may concern:

Be it known that I, CHRISTIAN ESSER, a citizen of the Empire of Germany, residing at Wiener-Neustadt, Lower Austria, Empire of Austria-Hungary, have invented a certain new and useful Method for the Production of Half-Stuff from Peat-Turf, of which the following is a specification.

My invention relates to certain new improvements in the method or process of reducing peat-turf to half-stuff; and it consists of the various steps and operations hereinafter more particularly described.

In order to thoroughly understand my invention, it should be understood that peat-turf consists of partially-decayed vegetable growths—such as mosses, ferns, grasses, and the like—which have died down and been submerged by the water of the bog wherein they have been growing and that these vegetable growths are composed of a fibrous skeleton or framework of cellulose embedded in and surrounded by softer vegetable matter. The cellulose or fibrous portion of the plant is the part usually employed in the manufacture of the finished product. In the formation of peat these vegetable growths or plants after being submerged for some time are attacked by the oxygen in the water, and decomposition gradually takes place, the softer vegetable matters yielding to this attack first and the harder fibrous cellulose last. In its natural state, however, the cellulose consists of bundles or groups of fibers adhering more or less strongly together, and these bundles must be reduced and the individual fiber separated before they can be used in the manufacture of paper or paper-board.

Some methods hitherto known for the production of half-stuff—that is, the separation of the individual fibers—are based on chemical treatment, and these give rise to the objection that the finer or individual fibers are destroyed or hopelessly injured if the action of the process is allowed to continue until the bundles or larger ones have been sufficiently reduced, and in such a case it usually happens that during the further treatment (alkali treatment) in making the half-stuff into paper the useless fine particles of cellulose thus produced settle and form an impervious layer at the bottom of the sieve and are, moreover, incapable of felting owing to their mi-

nuteness. Not only is the sluggish outflow of the water thus produced the direct cause of the slow speed of the mill, but the article so produced is altogether of low quality by reason of the faulty felting capacity of these minute particles in the half-stuff.

It should of course be understood that in the natural production of peat the decomposition which takes place is far from uniform, the smaller fibers or bundles of fibers offering less resistance to the decomposing action than the larger ones and are therefore rendered far more tender and susceptible of destruction or injury.

It is the object of my invention, therefore, to obtain the necessary reduction of fiber and the separation of the bundles thereof into their individual constituents without injury to the finer and more tender fibers and at the same time in a more satisfactory manner; and, broadly speaking, the invention consists in loosening the fibers from each other by rubbing or other mechanical action, so that the bundles are disintegrated, while the finer particles are uninjured in any way, but are by the same operation provided with a protective coating or retaining means, as will be hereinafter more particularly described.

Various means may be used in carrying out my invention; but one machine which I have found well adapted for my purposes is that described in United States Letters Patent No. 690,363, issued to me on December 31, 1901, of which this application is a division, and wherein the bundles of fiber of the peat-turf are reduced and separated by the action of reciprocating stampers upon said peat, which is carried by a table or platform constantly moving beneath the said stampers and at substantially right angles thereto, whereby a rubbing, tangential, or massaging action is produced, completely disintegrating the coarser fibers or bundles of fiber.

In practicing my invention the peat-turf, in its natural spongy moist condition as it comes from the bog is spread upon the table in a layer of the desired thickness, and the table is then started in motion. The reciprocating stampers are also put in motion and strike the moving layer of peat, crushing the bundles of cellulose and separating the individual fibers by rubbing them apart. The softer vegetable matter in the peat of course

offers but little resistance to the action of the stampers, which penetrates the mass; but this softer vegetable matter, which has been reduced to a sticky, gluey, or gelatinous condition by the decomposition is forced into immediate contact with all of the finer fibers and with the new faces of the individual fibers as the bundles are broken up, where it adheres to the irregular surfaces of the fibers by reason of its own tenacity or by pressure of the surrounding air where it encounters a recess. Thus the bundles of fiber are completely reduced and the individual fibers separated, and all of the fibers thus obtained are smeared or coated with an envelop. of the gelatinous matter, which, by reason of its stickiness and adherence, furnishes a means for increasing the retentiveness of the said fibers, and, furthermore, increases their size, which materially aids in obtaining this result.

The action of the stampers on the peat-turf is so regulated as only to crush the coarser particles or bundles of fiber which lie between the faces of the stampers and the table-surface, while the fine particles and individual fibers already segregated and which are already suitable for working into half-stuffs are protected by the thicker parts from the action of the stampers, and thus remain uninjured. By this mechanical treatment of the peat-turf the useless and wasteful extraction of the weaker and finer fibers is substantially prevented, and only those parts are reduced which are otherwise unsuitable, while all of the fibers are provided with a protecting or retaining means which serves materially in preventing the fine particles from being washed away and lost.

In this application I have referred to the product of my process—that is, the half-stuff—as being intended for use in the manufacture of paper or paper-board, and this is one of its principal uses; but it will be understood that it may be employed to advantage in the manufacture of various other products, such as molded or pressed products, and I do not mean to limit myself to any particular use to which the half-stuff is to be put.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The method of producing half-stuff for the manufacture of paper or paper-board, consisting in subjecting a mass of peat-turf while in its natural state to a pressure sufficient only to separate the fibers of the fibrous material and maintaining the said fibers in association with the non-fibrous materials contained in the mass and while the said materials are in the natural moist condition.

2. The art of producing half-stuff from peat, consisting in placing a body of peat in its natural condition as it comes from the bog, in position to be reduced to a pulpy consistency, and then applying pressure to the

mass of material sufficient to separate the fibers from the bundles, stems or stalks contained in the mass, but insufficient to destroy or break up separated fibrous portions of the natural mass, substantially as described.

3. The art of treating peat for the production of half-stuff, consisting in subjecting the body of material, while in its natural state as it comes from the bog, to a pressure sufficient to disintegrate the mass and release or separate the fibers, and insufficient to disintegrate the separated fibrous portions of the mass, substantially as described.

4. The method of producing half-stuff from peat-turf consisting in spreading the peat while in its natural state upon a suitable surface, subjecting it to pressure, and then causing a movement of the peat-turf to take place while under pressure so as to draw the fibers apart without destroying or injuring them, substantially as described.

5. The method of producing half-stuff from peat-turf, which consists in spreading the peat-turf while in its natural state upon a suitable surface, subjecting it to pressure, and then causing the said peat to move in a direction substantially at right angles to the direction of the pressure and during the continuance of said pressure, so as to draw the fibers apart without destroying or injuring them, substantially as described.

6. The method of producing half-stuff from peat-turf, consisting in subjecting a mass thereof while in its natural state to the action of disintegrating blows and moving said peat continuously during the said operation, substantially as described.

7. The method of producing half-stuff from peat-turf, consisting in subjecting a mass thereof while in its natural state to a sharp disintegrating blow, which is insufficient to force the stamper through the mass under manipulation, and then producing a movement of said mass while under pressure so as to separate the individual fibers in the mass without destroying or impairing the same, substantially as described.

8. The method of producing half-stuff from peat-turf, consisting in spreading the peat-turf while in its natural state upon a suitable horizontal surface, subjecting the peat so spread to the action of vertically-acting blows having sufficient power to disintegrate and separate the larger fibers or bundles of fiber, but insufficient to affect the finer fibers lying between the larger ones, and then moving the peat-turf horizontally while it is under pressure, substantially as described.

9. The method of producing half-stuff from peat-turf, consisting in spreading the peat-turf while in its natural state upon a suitable horizontal surface, subjecting the peat so spread to the action of vertically-applied blows having sufficient power to dis-

integrate and separate the larger fibers or bundles of fiber, but not affecting the finer fibers lying between the larger ones, and then moving the peat-turf continuously while

5 under pressure, substantially as described.

10 10. The method of producing half-stuff from peat-turf consisting in reducing the peat in its natural state to a uniform fibrous mass by a separation of the individual fibers in the presence of the gelatinous matter normally in the peat, and without subjecting it to any washing action during the reduction thereof, substantially as described.

15 11. The method of producing half-stuff from peat-turf consisting in breaking up the bundles of fibers of the cellulose contained therein in the presence of the gelatinous matter normally contained in the peat, and in rubbing the gelatinous matter into the

20 fibers when separated, substantially as described.

12. The method of producing half-stuff from peat consisting in subjecting peat

as it comes from the bog in a spongy condition to the action of pressure which will 25 break up the bundles of fibers without removing the gelatinous matter from the mass, and smearing the gelatinous matter upon the individual fibers so as to substantially coat the same with an envelop thereof, substan- 30 tially as described.

13. The method of producing half-stuff from peat-turf consisting in spreading the raw peat while in its natural state upon a 35 suitable surface and subjecting it to a tangentially-applied stamping operation which will penetrate the mass and disintegrate the bundles of fiber, and smear the surface of the individual fibers so separated with the softer vegetable matter contained in the peat. 40

In testimony whereof I affix my signature.

CHRISTIAN ESSER.

In presence of—

FRIEDRICK BINDLE,
ALVESTO S. HOGUE.