March 22, 1932. W. K. TALBOT 1,850,733

METHOD OF TREATING PAPER PULP

Filed Oct. 8, 1925 2 Sheets-Sheet 1

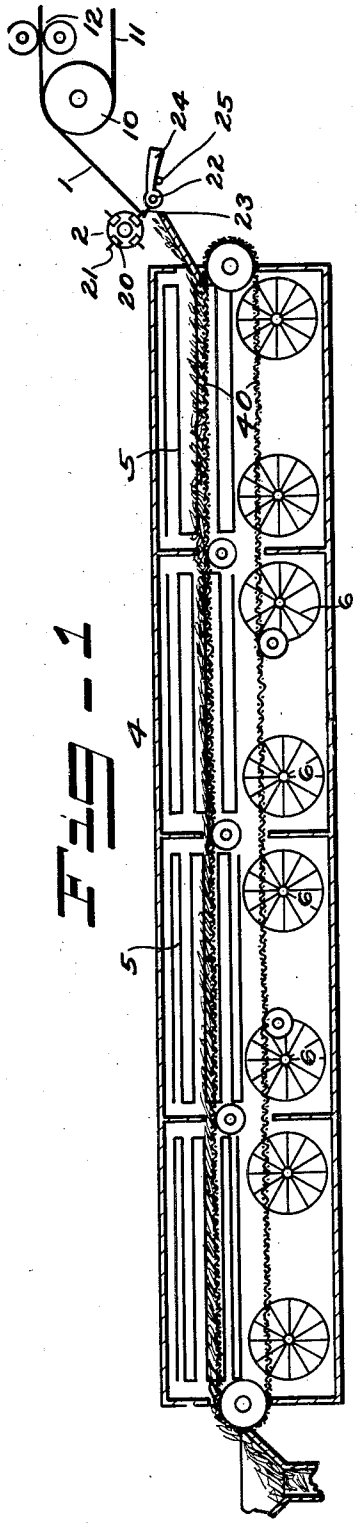


Fig. 1

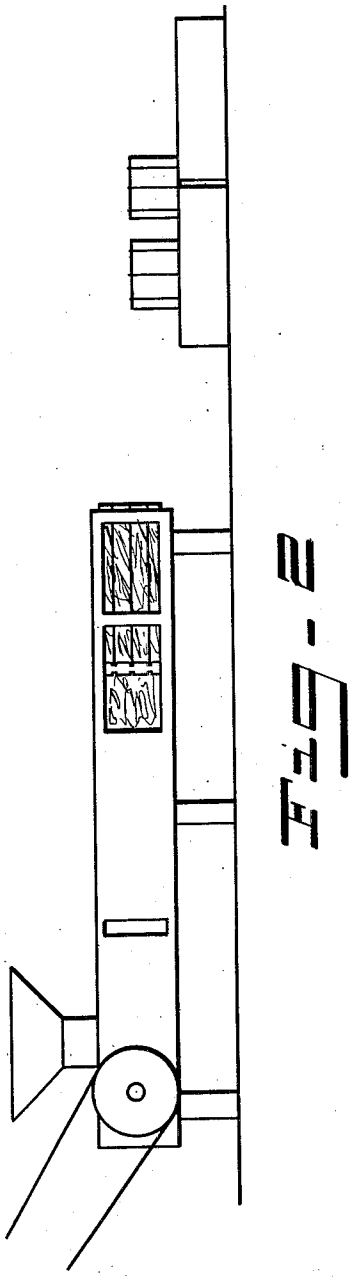


Fig. 2

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Fig. 3

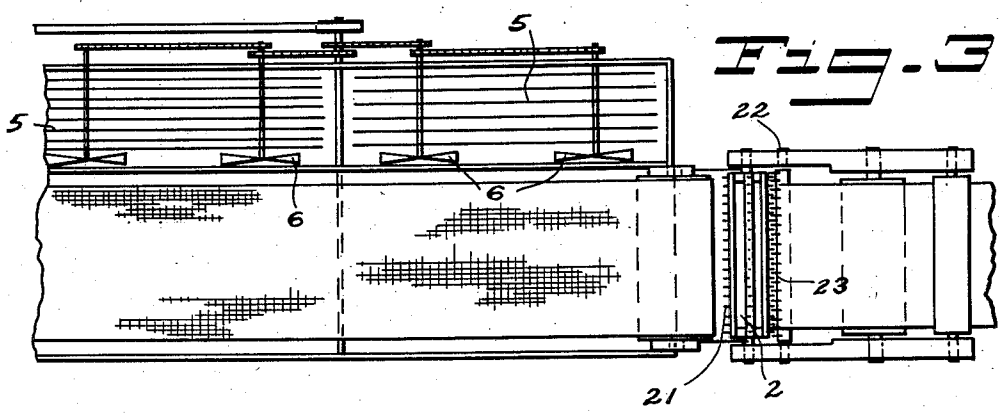
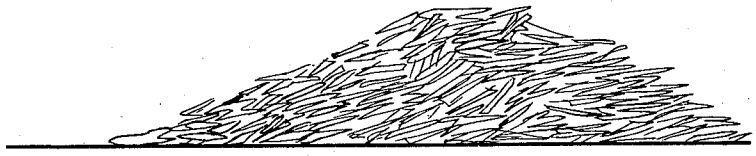


Fig. 4



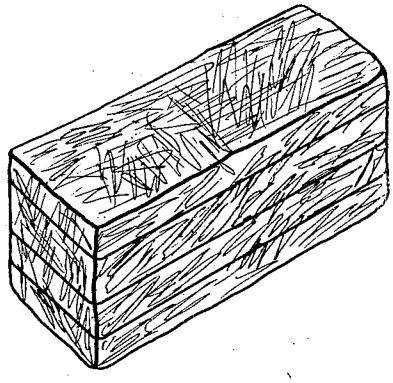


Fig. 6

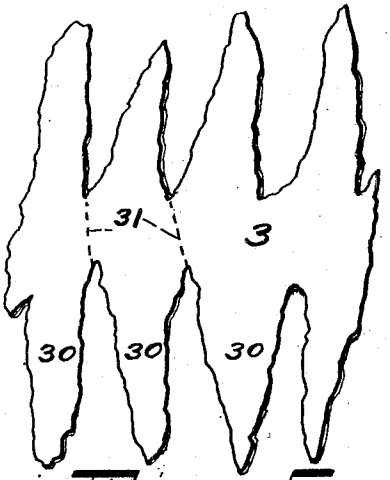


Fig. 5

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1,850,733

UNITED STATES PATENT OFFICE

WILLIAM K. TALBOT, OF SEATTLE, WASHINGTON, ASSIGNOR, BY MESNE ASSIGNMENTS, TO OSSIAN ANDERSON, OF EVERETT, WASHINGTON

METHOD OF TREATING PAPER PULP

Application filed October 8, 1925. Serial No. 61,221.

My invention relates to methods of preparing paper pulp for shipment and the resulting product.

The object of my invention is to so treat and prepare paper pulp as it is first made, that the contained water may be expelled therefrom in an expeditious and cheap manner, after which the dried product may be baled and shipped to the paper mills without having to pay freight upon contained water.

My invention consists of the method employed in securing this result and also the new and novel commercial product resulting therefrom.

In the accompanying drawings I have shown a form of apparatus which may be used in carrying out my process, and have also illustrated the product resulting therefrom.

Figure 1 shows in side elevation an apparatus which may be employed in handling the paper web as discharged from the pulp mill in the preparation of my novel product resulting from the new process.

Figure 2 shows in side elevation a press which may be employed in baling the dried pulp product.

Figure 3 is a horizontal or plan view of a typical dry kiln apparatus which may be used in drying the product. In this figure and also in Figure 1, the adjacent wall of the kiln has been omitted to more easily and clearly show the interior equipment.

Figure 4 shows a loose pile of the resulting product.

Figure 5 shows a typical fragment of the product, and,

Figure 6 shows a bale, in which shape the product is packaged for shipment.

In the manufacture of pulp in mills which are purely pulp mills, that is, where the pulp is shipped as pulp to other mills for manufacture into paper, it is the common practice to fold the wet pulp sheets and package it into bales for shipment. As the pulp when baled contains approximately 50% moisture, freight must be paid on as much water as pulp.

To avoid this difficulty I have devised a plan whereby the wet pulp as it comes from the pulp mill is put into such physical condition that it is practical to expel the moisture by passing it through a dry kiln, after which the dried pulp is baled for shipment. In this way the payment of freight upon a large water content is avoided and a large saving effected. A practical manner of accomplishing this result will now be described.

In Figure 1 is shown a newly formed web of pulp, 1, as it is discharged from a pulp mill. Of the pulp mill I have shown only the final roll 10 over which the blanket 11 passes, and the rolls 12 by which the water is partly squeezed out of the web. As the particular construction of the pulp mill is immaterial to my invention, its further illustration and description is deemed unnecessary.

Positioned to receive and act upon the pulp sheet as it is discharged from the pulp mill, is a shredding apparatus which shreds the pulp sheet into small particles which are then deposited upon the conveyor of a dry kiln, in passing through which dry kiln the moisture content of the shredded pulp is extracted.

The shredding apparatus illustrated consists of a revolving frame or skeleton drum 2, this having a number of bars 20 provided with projecting spikes or fingers 21, these cooperating with a like stationary bar 22 having its spikes or fingers 23 spaced to alternate in position with the spikes of the rotating drum. The bar 22 is pivoted and has an arm 24 which acts as a counterweight to hold the spike carrying bar 22 in position. A stop 25, adjustable in position may be employed to hold the bar 22 in position and yet to permit swinging of the bar 22 down in case a mass of pulp should be fed to the shredder. The size of the shredded fragments may to a certain extent be determined by the position of the bar 22, these being larger as the bar 22 is swung downwards.

In Figure 5 I have shown a typical fragment of the shredded product. They may be a series of individual fragments 30 jointed together as shown in full lines, or each fragment 30 may be severed from all others, as along the dotted lines 31. The size of the

fragments may be varied as produced by the same apparatus by adjusting the position of the stationary shredding bar 22. The more this bar is lowered the larger the fragments. If lowered sufficiently it may permit passage of the sheet without shredding.

The shredded fragments of the pulp sheet are deposited upon the endless conveyor 40 of a dry kiln 4. Means are provided for heating this kiln and for circulating air through the shredded pulp. Steam pipes 5 are provided for heating the air and circulating fans 6. The conveyor 40 should be of openwork character, as of a wire screen character, so that air may pass freely through it. The shredded pulp piles up on this conveyor to quite a depth, as its movement is slow.

The wood pulp is fibrous in nature, and in high grade pulp the fibres are depended upon to lend strength to the finished paper stock. When the pulp is in a wet condition, however, the fibres readily absorb moisture, thus almost wholly losing their tensile strength, and it is difficult to effect the shredding of the pulp without injuring the fibres thereof. It has been found that any rapidly rotating shredder of the beater type is wholly impracticable for use in shredding wood pulp, and I accordingly employ a shredder of the character described. The shredding devices are rotated at a relatively low speed, the spikes gently pulling small pieces of pulp from the body of the sheet and thereby substantially finely dividing it. The pulp is not finely shredded, but is divided into relatively small pieces which may be determined by adjusting the bar 22.

While I have described a particular type of dry kiln it is evident that any other type of dry kiln found to be suitable may be used.

When the dried shredded pulp is discharged from the dry kiln it is baled and is then ready for storage or shipping. Any suitable press may be used. The baling press, shown in Figure 2, is a standard make, originally designed for baling hay.

A given amount of pulp when so dried weighs about half as much as the same amount of pulp if baled in the customary way in its wet condition. In consequence the freight charges would be half as much for the same useful amount of product.

Experience has shown that it is impossible to dry the pulp sheet in its original integral condition without great complication and much time. By shredding the wet pulp sheet the particles are made small and these pile up loosely upon the conveyor so that air will circulate freely among them, thus facilitating their drying. When so prepared it is possible to quickly dry them and by using standard dry kiln of simple construction.

The size of the individual shreddings may be made anything found feasible and desirable. This may be determined within certain limits by adjustment of the shredding members, and within wider limits by variation of construction, particularly as to spacing of the shredding pins and their rate of rotation.

What I claim as my invention is:

1. The method of treating wood pulp which comprises separating wet pulp into a substantially loose divided condition by pulling relatively small pieces from the body of the pulp without injuring the fibres thereof, and drying the pulp while in such condition.

2. The method of treating wood pulp which comprises shredding wet pulp in a substantially loose divided condition by pulling relatively small pieces from the body of the pulp without injuring the fibres thereof, and subjecting the pulp to the action of heated air to dry it.

Signed at Seattle, King County, Washington, this 26th day of September, 1925.

WILLIAM K. TALBOT.