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APPARATUS FOR FEEDING PAPER PULPERS

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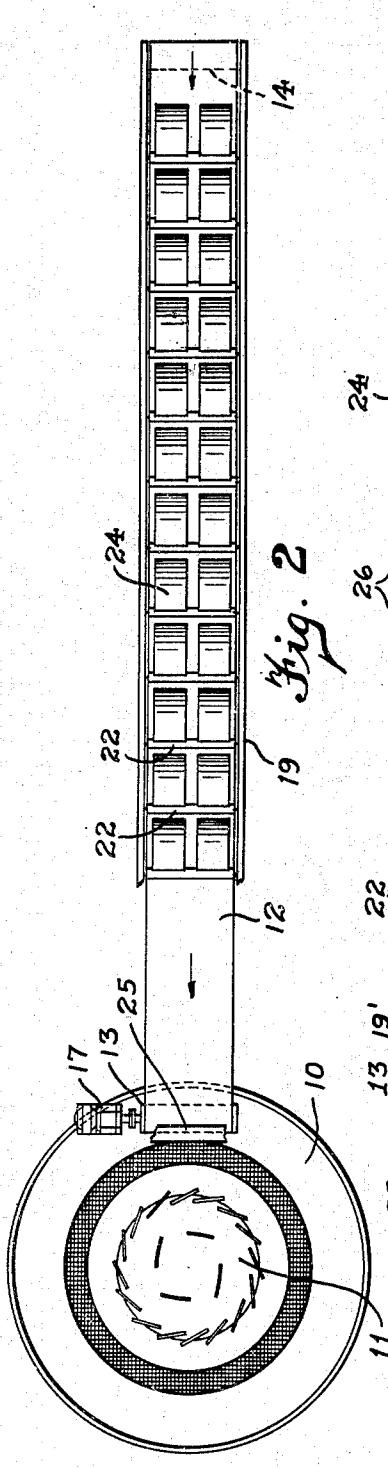


Fig. 2

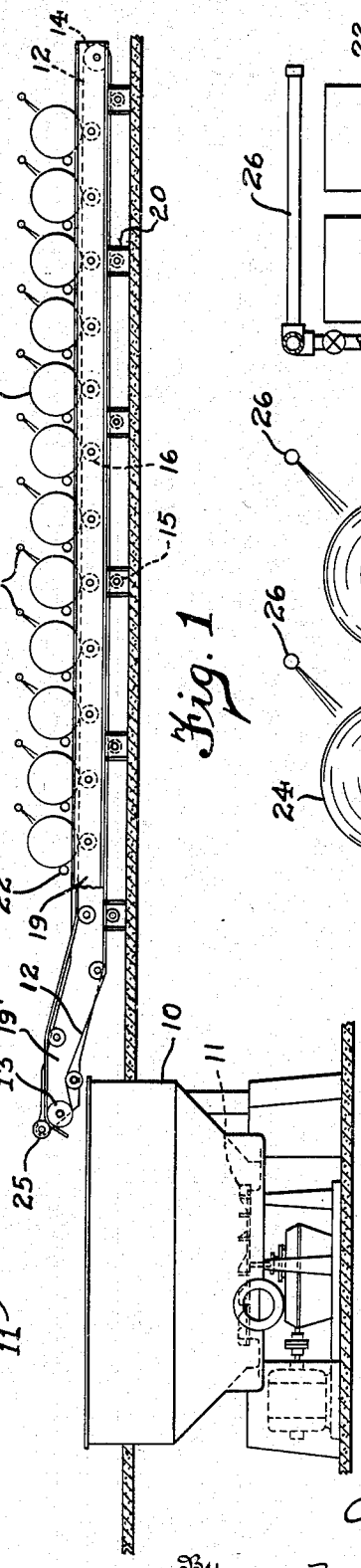


Fig. 1

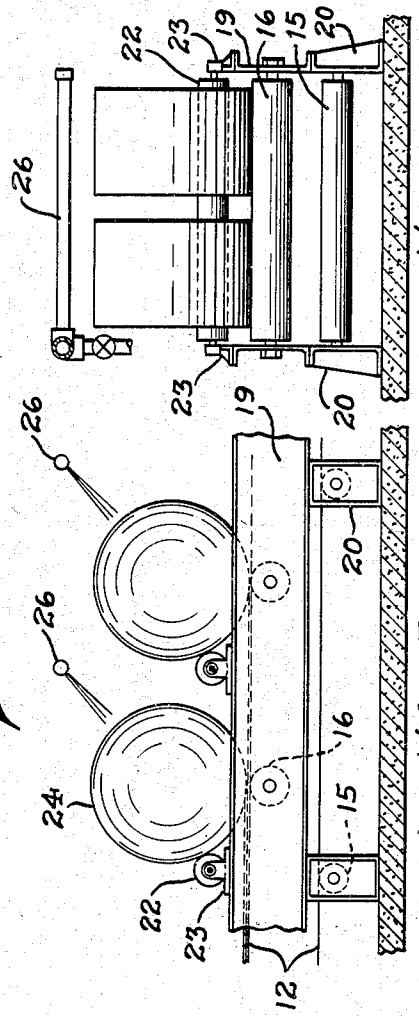


Fig. 4

Fig. 3

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APPARATUS FOR FEEDING PAPER PULPERS

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1 Claim. (Cl. 92—20)

This invention relates to the pulping of fibrous material, and more particularly to the feeding of pulp to a pulping machine.

One object of the invention resides in the method of charging a pulper, in which a continuous strip or strips of pulp are supplied to the pulper from a pulp roll or rolls, and providing for the convenient and economical handling of the rolled pulp at the pulping mill.

Another object is the method of charging a pulper, in which rolled pulp is unwound by a conveyor while the pulp roll or rolls are held against bodily movement along the conveyor, the unrolled strip or strips of pulp being carried along on the conveyor and supplied to the pulper at a desired rate.

Another object is the provision of apparatus for charging a pulper in accordance with the methods above mentioned.

Still other objects and advantages of the invention will be apparent from the following description, the appended claim and the accompanying drawing.

In the drawing,

Fig. 1 is a view, shown in side elevation, of pulp charging apparatus embodying and for practising the present invention;

Fig. 2 is a top plan view of the apparatus;

Fig. 3 is a fragmentary view on a larger scale, showing a portion of the charging apparatus; and

Fig. 4 is an end view corresponding to Fig. 3.

Referring more particularly to the drawing in which the same reference numerals have been used to designate like parts in the several views, and in which the preferred embodiment of the invention is illustrated in its association with a pulper used in the manufacture of paper, 10 generally designates a pulper of any suitable character adapted to pulp material supplied to it. The pulper comprises a tank or vat having suitable pulping means such as a rotatable plate 11 provided with blades which circulate and pulp the material, as in the manufacture of paper pulp stock.

In the manufacture and the drying of pulp used in the manufacture of paper it is more economical to roll the dry pulp up into rolls than to cut it into sheets and then wrap the bundle of sheets for shipment. However, it has been the general practice for the pulp manufacturer to supply the pulp in sheet form, as it has been more economical and easier to handle the pulp in the form of sheets at the paper mill where the material is pulped. This has been due to the fact that the expense of handling the rolled pulp at the paper mill has been greater than the savings effected at the pulp mill in making the pulp into sheets rather than supplying the pulp in the form of rolls. In accordance with the present invention however, pulp rolls may be readily and economically handled at the paper mill, and the pulp is readily supplied as continuous strips from pulp rolls, at a desired charging rate, regardless of the character of the pulper in which the material is pulped or beaten.

The apparatus by which the pulper is charged, in accordance with the present invention, comprises a conveyor 12, which is preferably a continuous rubber belt or a flexibly connected series of transverse bars, extending over suitable guide rollers and reaching from a drive roller 13 to a return roller 14. The lower run of the belt returns over suitable guide or supporting rollers 15, and other rollers 16 are arranged under the upper run of the conveyor and serve as guide and supporting means for this upper run. The drive roller 13 is operated by a suitable variable speed gear head motor 17 so that the conveyor is driven at a speed of the order of 150 feet per minute, traveling in such direction that the upper run of the conveyor moves toward the pulper 10, as will be apparent from the arrows shown in Fig. 2. Roller 13, around which the upper run of the conveyor turns downwardly, as will be seen from Figs. 1 and 2, is arranged adjacent the pulper so the pulp strips carried by the conveyor may be discharged directly into the pulper.

The rollers 16 are rotatably mounted, at their ends, in a pair of longitudinally extending spaced channels 19 which are carried in fixed positions at the upper ends of pedestals or supports 20. These pedestals also provide for the rotatable support of the rollers 15 over which the lower run of the conveyor is returned. The ends of the channels 19 adjacent the vat are provided with extension members 19' which support the drive roller 13.

Arranged above the level of the upper run of the conveyor are a number of idler or abutment rollers 22 which are spaced apart along the length of the conveyor so that the distance between adjacent rollers 22 is approximately the same or somewhat in excess of the diameter of the rolls of pulp to be used. These rollers 22, which extend transversely of the conveyor throughout the conveyor width, are rotatably arranged in brackets 23 mounted on the channels 19, and are spaced above the top run of the conveyor a suitable distance less than the radius of the rolls of pulp to be used.

The rolls of pulp 24 are dumped onto the conveyor preferably by using a suitable fork truck, with center spindles or end plugs applied to the pulp rolls so they can be readily handled by the lifting fork of the truck. The pulp rolls are placed between adjacent abutment rollers 22 and with the terminal end of the outer layer of pulp pointing in the direction of movement of the upper run of the conveyor when the terminal end is at the bottom of the pulp roll. The conveyor may be wide enough to accommodate a plurality of these pulp rolls in axial alignment, as shown in Fig. 4, and as many pulp rolls can be placed upon the conveyor as will be required to charge pulp to the pulper at a desired charging rate. As the conveyor moves, the various pulp rolls are kept from moving bodily towards the pulper by the abutment rollers 22 which serve as idlers permitting the pulp rolls to rotate about their own axes, and since these pulp rolls rest on the conveyor, the strips of pulp will be unwound and arranged in superimposed position on the conveyor and on one another. All of the pulp rolls on the conveyor will thus be unwound at the same time. As the channels 19 extend some distance above the upper run of the conveyor the rolls of pulp are held against moving laterally beyond the limits of the conveyor width.

Assuming for example that it is desired to charge 6000 pounds of pulp into the pulper in 6 minutes, using pulp rolls 32 inches in diameter and 29¼ inches in length and with a core diameter of 3¾ inches and a sheet caliper or thickness of about .036 inch. Each pulp roll thus has 392 layers or turns of pulp, with an average length per turn of approximately 56 inches. With a conveyor that operates at 144 feet per minute, 24 pulp rolls, each weighing 490 pounds, are laid on the conveyor and as all of these 24 rolls are unwound at the same time, the entire charge of 6000 pounds of pulp will be unwound and carried to the conveyor in the given time. If a smaller charging time is required in charging this same amount of pulp, more pulp rolls may be used or the speed of the conveyor may be increased, and if the required charge is less or if the charging time is greater, then of course a correspondingly smaller number of pulp rolls would be adequate.

The rollers 16 on which the upper run of the conveyor moves are arranged at such distance from the adjacent idler or abutment rolls 22 that the centers of the pulp rolls 24 that are applied to the conveyor will be directly over the centers of these rolls 16 when the pulp rolls are in engagement with the rollers 22 as indicated in Fig. 3. The weight of the pulp rolls, when these rolls are large, will thus be transmitted directly to the rollers 16 so as to relieve the conveyor from unusual stress.

A pinch roll 25 is preferably arranged adjacent the roller 13 for engagement with the upper strip of pulp carried by the conveyor, at a point near the place where the pulp is discharged into the pulper, to keep the pulp strips from curling back. Shower pipes 26 are also preferably arranged above the conveyor near the pulp roll locations on the conveyor so that a shower of water can be directed on each pulp roll to dampen the pulp strip just before it is unwound from the roll and before it goes into the pulper or beater. This permits the pulp to be more readily unwound and also provides a part of the water supply required in the pulping action.

In accordance with the present invention, it will therefore be apparent that the pulp rolls may be conveniently handled by suitable power operated lifting and transporting apparatus, without requiring the direct manual handling of the pulp rolls. The pulp rolls are thus readily placed on the conveyor, and as soon as the conveyor is started the pulp rolls will be brought up against their respective idler rollers 22 and the axes of the pulp rolls will automatically arrange themselves transversely of the conveyor within the confines of the conveyor width. The strips of pulp will be unwound and superimposed one on another on the conveyor and by using any desired number of rolls in accordance with the charging time requirements and the speed of the conveyor, any desired charging rate may be obtained.

While the method herein described, and the form of apparatus for carrying this method into effect, constitute preferred embodiments of the invention, it is to be understood that the invention is not limited to this precise mehod and form of apparatus, and that changes may be made in either without departing from the scope of the invention which is defined in the appended claim.

What is claimed is:

Apparatus for charging a pulper comprising a traveling conveyor of flexible material and adapted to carry strips of pulp from pulp rolls located on the conveyor to the pulper, means causing movement of the conveyor toward the pulper to unwind a strip from the periphery of each pulp roll, fixed abutment members extending transversely across the conveyor and spaced in the direction of travel of the conveyor a sufficient distance to receive the pulp rolls therebetween, each said abutment member being located at an elevation above the conveyor less than the initial radius of the pulp roll to provide continuing abutting contact with the periphery of the roll as its diameter decreases during unwinding, and rotatable carrying means supporting the conveyor and located substantially centrally beneath the several pulp rolls and in advance of the corresponding abutment member to provide for directly receiving the pulp rolls therebetween.

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