(No Model.)

C. E. GETCHELL.

METHOD OF MAKING ROLLS FROM HUSKS, &c.

No. 419,327. Patented Jan. 14, 1890.

Fig. 1.

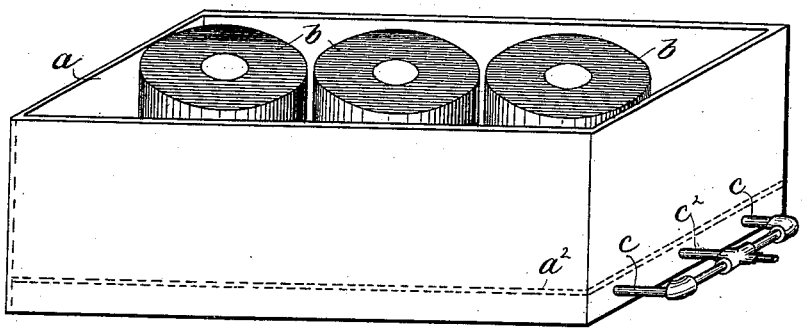


Fig. 2.

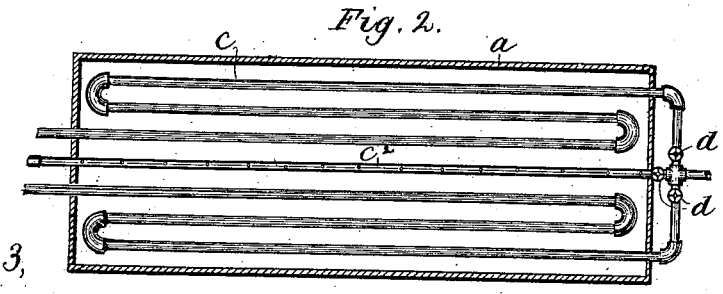


Fig. 3.

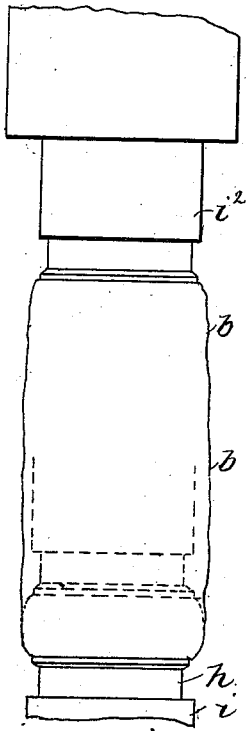
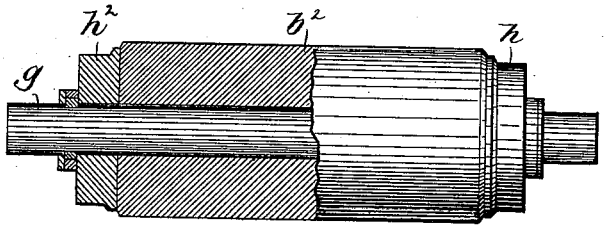


Fig. 4.



Witnesses.
Jas. J. Maloney.
M. E. Hill

Inventor,
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Atty.

UNITED STATES PATENT OFFICE.

CHARLES E. GETCHELL, OF WALTHAM, MASSACHUSETTS, ASSIGNOR OF ONE-HALF TO JOHN EDMANDS, OF SAME PLACE.

METHOD OF MAKING ROLLS FROM HUSKS, &c.

SPECIFICATION forming part of Letters Patent No. 419,327, dated January 14, 1890.

Application filed March 25, 1889. Serial No. 304,607. (No specimens.)

To all whom it may concern:

Be it known that I, CHARLES E. GETCHELL, of Waltham, county of Middlesex, State of Massachusetts, have invented an Improvement in the Method of Making Rolls from Husks and other Fibrous Materials, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

My invention relates to a method of making rolls of corn-husks, cotton, and other analogous substances, such as are employed in calendering-machines.

Calender-rolls for certain purposes are made from corn-husks, cotton, and analogous substances, which are compacted into a dense and solid mass upon a metallic shaft or core by subjecting the said materials to enormous pressure, and in making rolls of this kind the loose fibrous material is first formed into cylindrical bales or masses around a core of the size of the shaft upon which the roll is to be made, which core is then withdrawn from such mass of fibrous material. These masses from their shape are called "cheeses," and in making a roll the mandrel or shaft upon which the roll is to be formed, which is usually an iron or steel shaft about six inches in diameter, is provided with a head or disk that is to confine one end of the mass of fibrous material or form one end of the finished roll. The cheeses are then placed over the mandrel above the said head and are subjected to very great pressure, so that a mass originally extending several feet along the shaft is reduced to a thickness of three or four inches lengthwise of the shaft. The materials when thus compressed have considerable elasticity, so that if the pressure is removed shortly after it is applied they will again expand nearly to the original size, or, in other words, the material which should be compressed into a space of three or four inches along the roll will again open out into a length of three or four feet, and in the process of manufacturing rolls from husks or analogous materials as heretofore practiced it has been necessary to keep the material under great pressure for a period of several weeks, or even months, in which time the material will gradually lose its elasticity or power of expanding and become set in its condensed condition, so that when the pressure is removed it will remain nearly as dense as required for the finished roll, and additional cheeses may then be applied and compressed against the ones that have been densified by the long continuous pressure, and the operations repeated until finally sufficient material has been brought to the required density for the roll. In this manner it usually requires from two to three months to make a single roll, one press being occupied during the entire period of time.

I have discovered that by steaming the husks or subjecting the loose fibrous material to the action of dry steam for a short time the said material almost wholly parts with its elasticity without losing any of its other properties required for making the roll, so that the said steamed material when compressed to the required density will become set or lose its power of expanding again after remaining under pressure for a very few minutes; and the main novelty of the invention consists in steaming the fibrous material prior to the compression thereof. By this process it is possible with the same press to make a roll in a week or ten days that under the old process required some months for its completion. The steaming of the material may be performed before or after it has been made into cheeses; but it is generally more convenient to steam the material after it has been made into cheeses.

Figure 1 is a perspective view of an apparatus which may be employed for steaming the material for the production of rolls in accordance with this invention, the cover of the box or chest in which the material is steamed being removed; Fig. 2, a sectional plan view of the lower portion of the box or steaming-chamber; Fig. 3, a detail illustrating the operation of compressing the material; and Fig. 4, a side elevation, partly in section, of one of the finished rolls.

As a convenient means for steaming the material prior to its compression for the production of a roll in accordance with this invention, a box or chamber *a*, Fig. 1, is provided of any suitable size to contain any desired number of the cylindrical masses or

cheeses b, of loose fibrous material, which are placed in said box or chamber and inclosed therein by a tight cover. (Not shown.) The said box is provided with a false bottom, as indicated in dotted lines at a^2, Fig. 1, which supports the mass of fibrous material, and is perforated or provided with openings for the introduction of steam from below the false bottom.

The space between the false bottom a^2 and the actual bottom of the box contains pipes c, a portion c^2 of which may be perforated within the box to permit the escape of steam, which is supplied to the said pipes and controlled by suitable valves d. With the exception of the portion c^2, the pipes c are not perforated, but merely act to heat the interior of the chamber a and materials contained therein. When the materials are inclosed in the said chamber, steam is turned on, and, escaping from the pipes c^2, surrounds and permeates the fibrous material contained in the chamber, and the steam acts on said material, probably by its heat and slight moisture, to effect a certain structural change therein by which it parts with its elasticity, without, however, becoming soft or pulpy. The cheeses or fibrous material after having been steamed for a sufficient length of time (about ten minutes is usually sufficient) are placed around the shaft or mandrel g (see Fig. 4) and above one of the metallic disks or heads h, that are secured to said shaft, which disk is then supported on the platen i of a suitably-constructed press and the material acted upon by the piston or plunger i^2 of said press, which is recessed to pass down around the shaft g. The material is then subjected to several tons pressure, by which it is reduced in height in about the proportions indicated by the full and dotted line positions, Fig. 3, a pressure of many tons being required for this purpose. The nature of the material is such that the compression takes place almost entirely in the line of pressure, or, in other words, the material does not flow when subjected to such pressure and does not require to be confined laterally, and the steaming operation to which it has been subjected in accordance with this invention does not detract from this quality of the material, although it gives it the property of very quickly acquiring and retaining the condensed condition, so that after the pressure has remained applied for a few minutes it may be removed and the material will only expand or tend to return to its former bulk to a very slight degree, it being found in actual practice that the material acquires and retains as great density after subjection to pressure for a few hours as it would acquire only after subjection to the same pressure for a number of weeks if not previously subjected to the steaming process. After as great a mass as can be applied beneath the piston and press has been compressed to the desired density the piston and press are again raised, more of the material added and compressed upon that which has been before acted upon, and the said operations are repeated until a sufficient quantity has been compressed to form the body b^2 (see Fig. 4) of the roll of the desired length, when at the final pressure the disk or head h^2 is brought into place and secured by the keying devices i in the usual manner, as indicated in Fig. 4. The surface of the roll will then be rough and uneven, and will be finished by turning in the usual manner.

It is not essential that the steaming operation should be performed immediately before the compressing operation takes place, but the material may be steamed and then set aside until it is desired to compress it into the roll; but if it is to be kept for any length of time after steaming it should be baked or thoroughly dried, so as to prevent danger of mildewing. Such baking may be performed in the steaming-chamber a by cutting off steam from the perforated pipe c^2 and leaving the material subjected to heat from the pipes c until thoroughly dried.

I claim—

The art or process of making rolls from husks or analogous fibrous material, which consists in steaming the material while in loose or uncompressed condition and subsequently subjecting a mass of said material to pressure between dies or platens, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CHAS. E. GETCHELL.

Witnesses:
JOS. P. LIVERMORE,
M. E. HILL.