

*C. Wahl.
Drying Glue.*

N^o 80,248.

Patented Jul. 21, 1868.

Fig. 1.

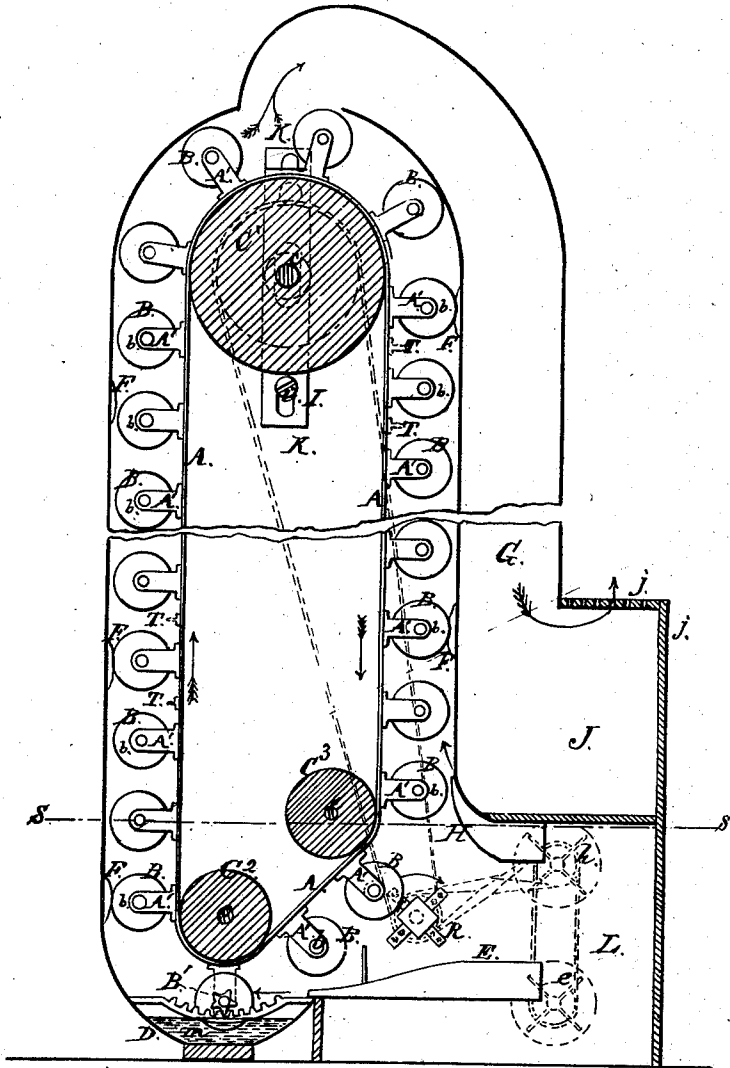
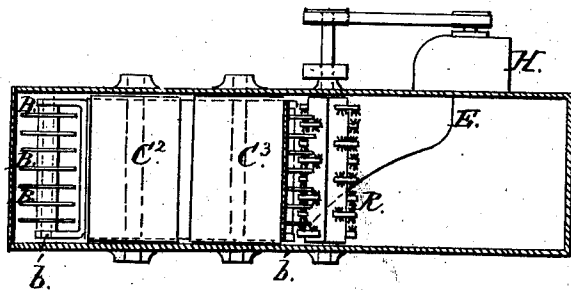


Fig. 2.



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CHRISTIAN WAHL, OF CHICAGO, ILLINOIS.

Letters Patent No. 80,248, dated July 21, 1868.

IMPROVED APPARATUS FOR DRYING GLUE.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, CHRISTIAN WAHL, of Chicago, in the county of Cook, and State of Illinois, have invented certain new and useful Improvements in Means for Drying Glue; and I do hereby declare that the following is a full and exact description thereof.

My invention produces the finished glue in thin flakes of the best quality, by a continuous operation, which may be effected very rapidly, and with little labor. Some portions of my apparatus have been before patented, but the features have not, so far as I am aware, been before combined, and several features of importance I believe to be entirely new.

I will first describe what I consider the best means of carrying out my invention, and will afterwards designate the points which I believe to be new therein.

Figure 1 is a side elevation of the entire apparatus, with the side removed to give a good view of the interior.

Figure 2 is a cross-section on the line S S in fig. 1.

Similar letters of reference indicate corresponding parts in all the figures.

A is an endless belt, of leather, rubber, canvas, or other suitable strong material. A' are arms, extending out therefrom, and adapted to support at their ends the shafts *b*, on which is mounted a series of circular plates or disks, B. On these disks the glue is dried in a thin coat, which cracks and comes off with facility as the operation of drying becomes complete.

I may remark here that the disks B are of enamelled iron, or some material which presents an enamelled or glossy surface, in order to avoid the reactions which are liable to occur between the glue and a metallic surface.

The shafts *b* carry gear-wheels B', near their ends, by means of which a rotary motion is communicated to the shafts *b*, and to the plates B, at intervals, from curved racks provided for that purpose. I can, under some circumstances, make these parts B' smooth pulleys, covered on their outer surfaces with leather or rubber, to afford a suitable frictional contact, and allow them to roll against fixed surfaces during the greater portion of their journey, and to roll against actively-rotating surfaces during the period or periods when their rotation requires to be active and positive.

C¹ C² are cylindrical drums, mounted on shafts *c*, the one above the other, and at such distance apart as the work will require, or as the dimensions of the building will accommodate.

C³ is an additional drum, mounted a little out of the central line, the purpose of which will appear further on.

D is a trough or vessel, which contains the glue. It may be kept at the proper temperature by any approved means.

The plates B, after being partially immersed in the glue *m*, are rotated several times, so as to coat the surface uniformly with the fluid.

The number of revolutions of the plates B, while partially immersed in the liquid glue, the rapidity and temperature at which the entire operation is conducted, must vary greatly with the variations in character or quality of the glue. I prefer, in ordinary cases, to turn the plates twice, exposing the plate to as low a temperature as practicable when it comes out of the bath, in order to congeal or harden the thin coats of glue on the surface. One of the most convenient modes of thus cooling the glue is to expose it to a blast of cold air.

E is broad flue or spout, from which a blast of cold air is discharged by the action of a fan, *e*.

It will be understood that the drums C¹ C² are slowly turned, either continuously or at intervals, by means of a steam-engine or other power, not represented, and that the plates B are carried up in a series at one side, and descending in the same manner in the other, being supported on the belt A. During the whole of the descending motion, the plates are exposed to warm, dry air. This air is supplied through the flue H by means of a fan, *h*, it being previously heated by an air-heating furnace, or other efficient and readily-controllable means.

I propose to employ chloride of calcium or other absorbent chemicals, in addition to the heating of the air, to increasing its drying effect. The temperature at which this warm air is introduced should vary, as before suggested. With some kinds of glue, it should not be above 75° Fahrenheit, with other kinds, it may, without

danger, be heated up to 120°. The dry air introduced by these means blows up on one side of the apparatus, passing in succession between the several series of plates B, which are descending on that side.

Under ordinary circumstances the glue will separate spontaneously from the surfaces of the plates or disks B during their descent, but I have provided a revolving brush, R, turned by the steam-engine or other power, which brushes the entire surface of each disk, and removes any flakes of glue which might chance to remain adhering, on their arrival at that point.

I consider it important that the plates B are capable of rotating, and they do rotate, as above described, at two periods, to wit, while they are partially immersed in the glue at the commencement of each operation, and while they are being brushed to remove any glue which may remain, at the termination of each operation. I consider it also an advantage, though to a far less degree, to rotate them continuously and slightly during their whole journey. This exposes all the parts very uniformly to the action of the warm and dry air.

The ascent of the plates may be exactly vertical. The upper drum is larger than the lower, and the descent is vertical until it reaches the drum C³. From there the endless belt runs inclined, as represented, and passes under the lower drum C². In traversing the incline between C³ and C², any remaining particles of glue not already fallen from the plates B, may be removed by rotating brushes. The glue produced in this manner is in the form of thin flakes.

I prefer to blow the warm air in a very gentle current, but it is liable, with every precaution, to carry up large quantities of the light flaky material, and to discharge it through the passage G. After passing out of the passage G, it is received in a capacious chamber, J, which is covered at the top and upper sides with wire gauze j.

F are projections or partitions of vulcanized rubber, extending inward from the walls of the casing. They extend inward so far as to touch the edges of the disks. As each series of the disks B passes each projection F, it is touched, and partially turned. This turning or assisting to turn the disks is only a part of the duties of these partial partitions. Another part of their duties is to deflect the currents of air passing the several series of disks, and to prevent any portion passing unobstructedly along the casing outside of the several series. They compel the air to circulate thoroughly among the disks. I propose, in most cases, to provide analogous projections or partial partitions extending outward from the belt A, between the several series of disks, as indicated by the red outlines T, to prevent the currents of air from passing freely inside the several plates or disks.

The upper drum C¹ is mounted on a frame, I, which is adjustable up and down, and is confined in the desired position by the bolts z, standing in slots K, as represented. After slackening the bolts z, the upper drum C¹ and its connections may be raised by wedging, or any other convenient means, not represented, and it may be then fixed again by the bolts z. Thus, any slackening of the belt A, due to wear, or any change of length, due to change of temperature or moisture, may be compensated for.

I have described the axes b, as mounted permanently on the arms A'. I prefer this construction for most purposes, but I propose, in some instances, to provide bearings, which will allow the shafts and their contents to be removed by operating a suitable catch. I can then immerse and turn the plates by hand in the liquid glue, and, after their brief exposure to a low temperature, or to the action of a cold blast, (to which they may be exposed by hand in a similar manner,) in the same or a separate apartment, they may be mounted on the endless carrier A, and exposed during their whole journey thereon to dry warm air driven by fans or other suitable devices. In such case the mechanism may be very greatly simplified, the tank D being changed in position, and the drum C³ being dispensed with. The functions of the drum C³ will be understood as holding the descending part of the belt A in such position that the glue falling, by gravity, from the plates B, in their descent, will be certain to fall outside of the vessel D.

L represents a bin or vessel, specially provided to receive all those portions of the flaky glue which are not removed by the currents of air.

Many modifications of my invention may be constructed by any good mechanic, and still preserve some of the advantages of my invention.

I have intimated near the commencement that the plates B are of enamelled iron or analogous substances, to avoid chemical reactions. I attach much importance to this feature of the apparatus. Glue, as made under nearly all ordinary conditions, contains acid. Sulphuric acid and other acids are usually added to the material in the course of the manufacture of glue, especially the higher grades, and these additions are rarely, if ever, entirely neutralized. Now, I prevent any injurious effect of the acids upon the plates or disks B, by making the latter with an earthy surface. I can make the plates entirely of glass, porcelain, stone-ware, terra cotta, or other varieties of vitreous or ceramic ware, but I prefer to employ the great strength of iron, with an earthy surface, and thus give the choice to enamelled iron, by which I mean iron prepared with an intimately-adhering coating of earthy baked or vitreous glazing.

I esteem it possible to withstand the acids by the use of copper, silver, or the like surfaces, but I esteem the earthy not only cheaper, but better and more durable.

Apparatus for pouring or squirting the liquid glue upon the surfaces B may be substituted for the tank D, if preferred.

Having now fully described my invention, what I claim as new therein, and desire to secure by Letters Patent, is as follows:

1. I claim the employment of earthy surfaces upon which to expose the glue, substantially as and for the purposes herein set forth.
2. I claim the combination of the revolving disks B with the endless belt A, or its equivalent, for transporting them for a considerable period through a drying current of air, substantially as and for the purposes herein set forth.

3. I claim the adjustable pulley *C'*, arranged as represented relatively to the endless belt *A*, and to the glue-exposing surfaces *B*, carried thereon, substantially as and for the purposes herein set forth.

4. I claim the deflectors *F*, arranged as represented, relatively to the current of dry air, impelled as represented, and to plates or glue-presenting surfaces *B*, which are transported past them, substantially as and for the purposes herein set forth.

In testimony whereof, I have hereunto set my name in presence of two subscribing witnesses.

CHRISTIAN WAHL.

Witnesses:

C. C. LIVINGS,

W. C. DEY.