Jan. 9, 1940. H. R. MADISON 2,186,118

APPARATUS FOR IMPREGNATING LOGS

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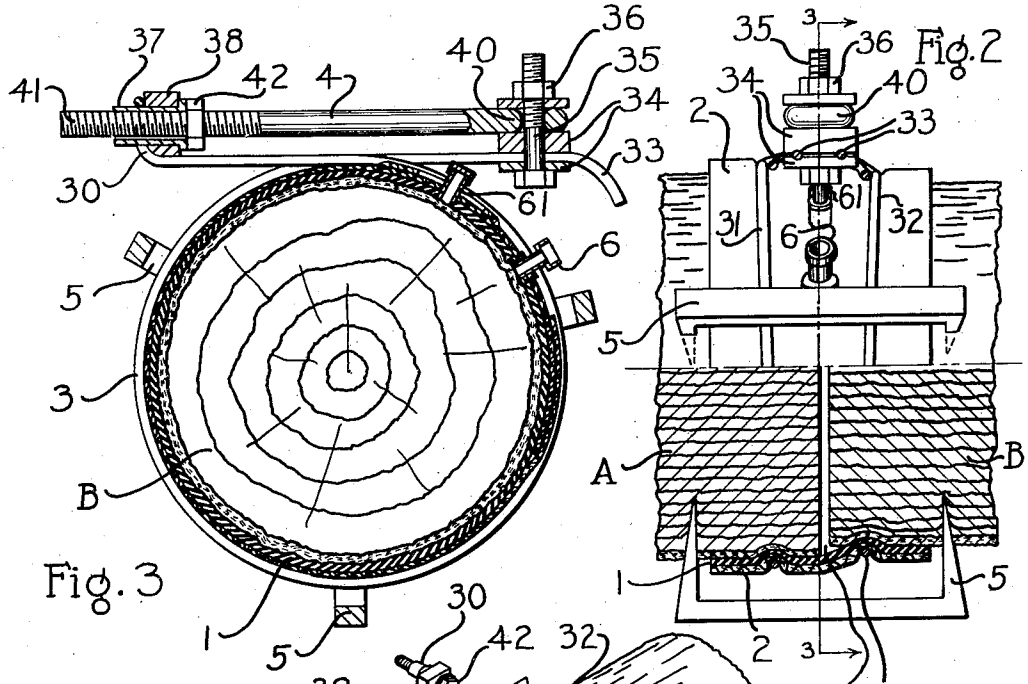


Fig. 3

Fig. 2

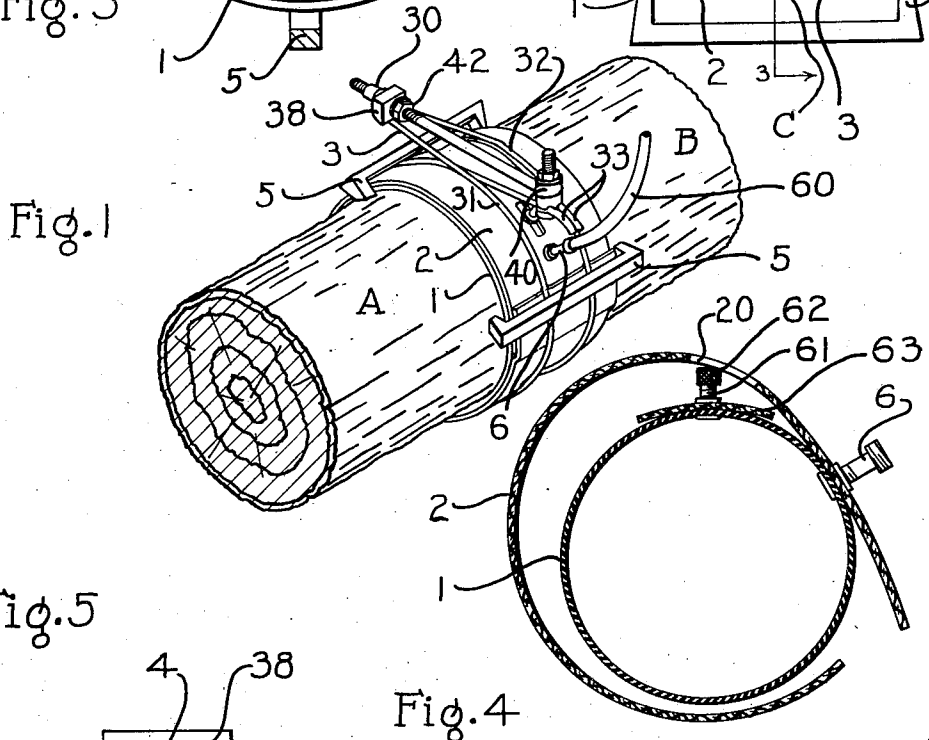
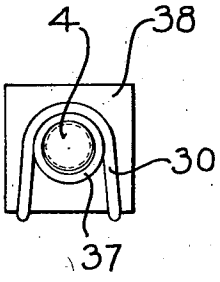


Fig. 1

Fig. 4

Fig. 5



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APPARATUS FOR IMPREGNATING LOGS

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3 Claims. (Cl. 21—71)

My invention is concerned with the impregnation of logs by liquids. By "logs" I mean not only natural logs, but prepared or semi-prepared timbers, though usually of rounded shape or having at least rounded ends.

In so far as the method is concerned, the impregnation is accomplished by means of a liquid supplied under low pressure to the end of a log or to the butted ends of two logs, and may accomplish one of several purposes, or more than one such purpose—for instance, coloring of the wood, or treatment with a preservative. Such impregnation, however, can only be satisfactorily accomplished with green logs, that is to say, logs from trees which have been recently felled and in which the sap still remains. The probable reason for this is that the impregnation occurs through a process of osmosis, and by reason of the presence of substances in the impregnating liquid or solution which will react with or be compatible with the sap in the cells of the wood. It is my experience that it can not be satisfactorily accomplished with dry logs, logs from trees that have been felled for some time. While impregnation can be accomplished and is accomplished in dry timbers or logs by high pressure methods, low pressure impregnation can only be accomplished with green logs. My method is therefore concerned with the impregnation of green logs in distinction to dry logs.

It has been proposed heretofore to supply a cap about the end of a single log, and to supply an impregnating liquid beneath such a cap to travel lengthwise of the log, but by my invention I provide apparatus whereby two such logs, with their ends butted, can be supplied simultaneously with the impregnating fluid, so that the impregnation of the two logs is accomplished simultaneously, thereby saving in time, in handling, and in other ways, and effecting economy of equipment.

Among the objects of my invention are to provide simple, inexpensive and convenient apparatus for enclosing the butted ends of two logs to form between them a closed chamber for the reception of impregnating liquid.

It is a further object to provide a simple and easily applied device for application to the two ends of such logs, notwithstanding variations in their diameter and circumferences.

A still further object is the provision of apparatus which will securely seal the ends of such an encircling device about each log, which will automatically produce substantially equal sealing about the two logs, notwithstanding differences in their diameter, in other words, to produce a sealing device of this type which is automatically self-adjusting to different diameters and circumferences of logs, and which therefore requires little or no special preparation of the ends of the logs which are to be sealed.

Still another object is to provide a method whereby two such logs can be successfully impregnated simultaneously.

Briefly, and as previously stated, the method employed is operable only upon green logs. Two such logs which do not differ too greatly in diameter are placed in substantially abutting relationship, end to end. The butted ends should be convex throughout their circumference, and should there be a groove or flute longitudinally of such a log it is necessary to reverse the log end for end, if the opposite end is convex, or to eliminate this flute. This can be done roughly and quickly with a draw knife, removing the surface of the log at either side of such a flute until the bottom thereof merges into a generally convex circumference. If the bark is rough it may be removed or smoothed down, but with smooth barked trees this is not essential. With the two ends thus prepared, if necessary, to produce an approximately smooth and circular end, a rubber sleeve is fitted about the end of one log, is then fitted about the end of the other log, and a non-elastic, flexible band, for instance of canvas, is wrapped about the rubber sleeve, its ends overlapping somewhat, thus preventing the rubber from bulging outwardly under internal pressure. The rubber sleeve and canvas band constitute a collar encircling the butted ends of the two logs to define within it, and between the ends of the logs, a chamber for the reception of impregnating liquid, which liquid is introduced by a suitable nipple penetrating and holding together the sleeve and band. Arrangements are provided for venting the air from this chamber, for if air is permitted to remain in the chamber it tends to be forced lengthwise of the logs, and in effect produces air locks within the sap channels of the logs, which air lock portions are therefore insufficiently impregnated or impregnated not at all. Before supplying the impregnating liquid, however, the ends of the collar are encircled with a suitable binder, as a cable, and the cable is drawn taut by means which cause it to completely encircle the log through 360 degrees, and to be equalized in tension about the two logs, notwithstanding differences in their diameters. Thus sealed the impregnating liquid is admitted into the chamber, and by a process which is be-

lieved to be one of osmosis the solution travels lengthwise of the sap wood of the log, finally exuding at the opposite end, and by this exudation indicating that the process of treatment has been completed. The pressures used are low, for instance in the neighborhood of ten pounds to the square inch, but even such low pressures, when applied to the ends of a log, produce very considerable forces tending to separate the logs endwise, and I therefore provide means which span the gap between the logs to hold them together and to resist this tendency to endwise separation.

My invention is shown by way of illustration in the accompanying drawing, wherein Figure 1 is a perspective view of the butted ends of two logs, showing my device applied thereto in readiness for operation;

Figure 2 is in part an elevation and in part a section, showing the various parts of the apparatus in condition for operation, and Figure 3 is a transverse section substantially on the line 3—3 of Figure 2, the end of one log being shown in end elevation;

Figure 4 is a section through the elements constituting the collar, shown in relaxed position; and

Figure 5 is an end view of a detail of the mechanism.

Two logs A and B are suitably supported and brought into position where their ends substantially abut. As previously stated, their abutting ends will usually require no preparation, but if necessary they can be prepared as indicated above, with a draw knife. Assuming that the ends are substantially circular and that the bark is not unduly rough, there is applied upon one such log the rubber sleeve **1**, which is of sufficiently thin material that it can be stretched appreciably to accommodate logs of differing diameters and circumferential extent. The sleeve is preferably of rubber or a rubber compound, but any similar material having the capability of stretching and adjusting itself to the different sizes of logs, and not affected by the liquid being used, may be employed. This sleeve, after being thus slipped over the end of one log, is slipped over the end of the other log, in a similar fashion. Since pressure is to be exerted on the inside of the chamber C, thus defined between the abutting ends of the logs and within the rubber sleeve, and the rubber sleeve will tend to bulge unduly under such pressure, it is preferable to support it externally, and this may be done by means of the flexible but non-elastic band **2** of canvas or the like, which is wrapped about the rubber sleeve, with its ends overlapping to whatever extent is necessary by the size of the logs.

To hold in place the composite collar thus constituted, a wrap is taken about the end of each log within the end of the collar by means such as a steel cable, and in order that the sealing force may be substantially uniform about the two logs, and to make the cable self-adjusting to the different diameters of two butted logs, I prefer that the wrapping be accomplished by doubling the cable **3** upon itself, as indicated at the point **30**, passing one wrap **31** about the log A, for instance, and the other wrap **32** in the same direction about the other log B. Each of these wraps encircles its respective log through 360° and passes beyond that point so that the ends **33** are spaced by more than 360° from the doubled portion **30**.

These free ends are secured by suitable securing means, as for instance, the clamp constituted by the companion clamping means **34** and the bolt **35** and nut **36**. The doubled portion **30** is likewise engaged, but preferably by a means which permits the cable to run lengthwise in one direction or another to equalize between the wraps **31** and **32**. Thus the doubled portion **30** is received upon a sleeve **37** which is freely rotatable upon a rod **4**. The rod **4** is preferably in the form of an eye-bolt having an eye **40** at one end, receiving the clamping bolt **35**, and threaded at **41** at its opposite end, and upon these threads is received a nut **42**, bearing against the end of the sleeve **37**. A washer **38** is preferably interposed between a flange of the sleeve **37** and the doubled portion **30** of the cable **3**.

The rod **4**, with the parts thus arranged, constitutes a means to separate the clamped ends **33** of the cable and the doubled portion **30**, which, as previously stated, are separated by more than 360° about the logs, and by forcing these two ends of the wraps apart, by threading the nut **42** outwardly along the rod **3**, each wrap **31** and **32** is drawn tightly about its log, and through the entire 360°. The portions of the cable immediately adjacent the ends of each wrap are drawn into alignment and tangent to the log. The washer **38** should be formed to prevent a sharp bend in the cable and to space its tangential portion sufficiently below the nut **42** to permit the latter to be turned without interference. As the cable is tightened any excess of tension in one wrap, as **31**, will be compensated for by drawing the cable around the sleeve **37** or permitting the sleeve to turn about the rod **4**, with the result that the tension in each of the wraps is substantially equal, and no excessive stress is applied to either wrap.

By these or equivalent means each wrap is caused to draw the flexible collar **1**, **2** tightly about the entire circumference of each log, and indeed until the cable tends to bite into the logs, as is indicated in Figure 2. This forms a secure seal for the chamber C.

In order to hold parts in this position, since the pressure at ten pounds per square inch upon a log of 16 inches diameter is in the neighborhood of 2000 pounds, I employ means to hold the logs together, and these are conveniently in the form of dogs **5** pointed at each end and of a length to span the gap between the logs and the collar encircling them, the pointed ends being driven into the two logs before or after cinching up on the cable. As many such dogs are employed as are necessary, these being spaced circumferentially about the logs.

The collar, consisting of the rubber sleeve **1** and the fabric band **2**, is pierced and a nipple **6** is secured and sealed within a suitable aperture through the collar, as may be seen in Figure 4, whereby a tube **60** may be coupled, this tube leading from a suitable source of impregnating liquid (not shown) under pressure, as for instance under a hydrostatic head sufficient to produce the desired pressure within the chamber C. Since the air should be removed from the chamber before the process will operate entirely satisfactorily, a second tube **61** pierces the collar and is provided with a cap **62**, whereby it can serve as an air vent, and can be closed when all the air has been expelled from the chamber by the rising liquid therein, the vent being placed at about the highest point in the chamber to prevent entrapment of air. This vent **61** may be sealed in the rubber sleeve only, protected by a

flap 63 of canvas, and the band 2 may be slitted, as indicated at 20, to pass the outer end of the connection 61, the slit permitting the connection 61 to accommodate itself in position to the stretching of the rubber sleeve 1 in fitting about logs of different diameters.

In operation the rubber sleeve 1 is fitted to a given log, another log is brought into butting relation thereto, and the rubber sleeve is fitted about the end of the second log. The band 2 is now wrapped about the rubber sleeve, the sealing cable is secured in place, and the dogs, and the chamber C is securely sealed. Impregnating liquid is permitted to flow in through the nipple 6, filling the chamber and forcing air out through the connection 61, the cap 62 being then removed. When liquid begins to escape from the connection 61 the cap 62 is replaced, and the impregnating liquid is permitted free access under pressure to the chamber, and passes under this low pressure lengthwise through the two logs simultaneously. When the liquid exudes from the entire area of the sap wood at the ends of the two logs the operator knows that the process has been completed.

What I claim as my invention is:

1. Apparatus for simultaneous impregnation of two butted logs comprising a collar adapted to encircle the butted ends of both logs, to constitute a chamber for the reception of impregnating liquid, means to introduce impregnating liquid within such chamber, a threaded rod extending transversely of the logs, adjacent such chamber, a sleeve rotatable about one end of the rod, a cable doubled about said sleeve, one end of the cable encircling one log and the associated collar and then extending to the opposite end of the rod, the other end of the cable similarly encircling the other log and the collar, and then extending to the latter end of the rod, means on the rod to clamp the two ends of the cable, and cooperative means to move the clamp and sleeve apart lengthwise of the rod, to separate the doubled back portion of the cable and the clamped ends thereof, to draw the cable tightly and with substantially uniform tension about both logs and the collar, to seal the chamber, said cooperative means including a member secureable in fixed position upon the rod and cooperating with one of the clamp and the sleeve, and a nut threaded upon the rod and engaging the other.

2. The combination of claim 1, wherein the cable clamp is formed and arranged to clamp also the rod, simultaneously as it clamps the cable ends, and thus constitutes the fixed member, and wherein the nut engages the sleeve, to effect separation of the sleeve and clamp, lengthwise of the rod.

3. The combination of claim 1, wherein the rod is formed with an eye at its end opposite its threaded end, and wherein the clamping means is supported in the rod's eye, the nut, threaded upon the end of the rod opposite such eye, engaging said sleeve, and acting to force apart the sleeve and the clamping means, by such separation cinching the cable about each log.

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