May 9, 1933. R. E. HALL 1,907,795

METHOD OF MAKING INTEGRAL FELTED FIBROUS STRUCTURES

Original Filed April 9, 1930

Fig. 2.

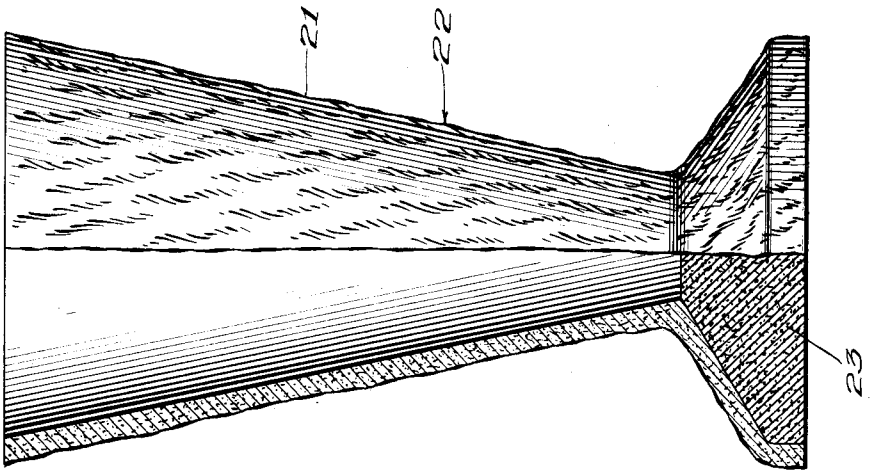
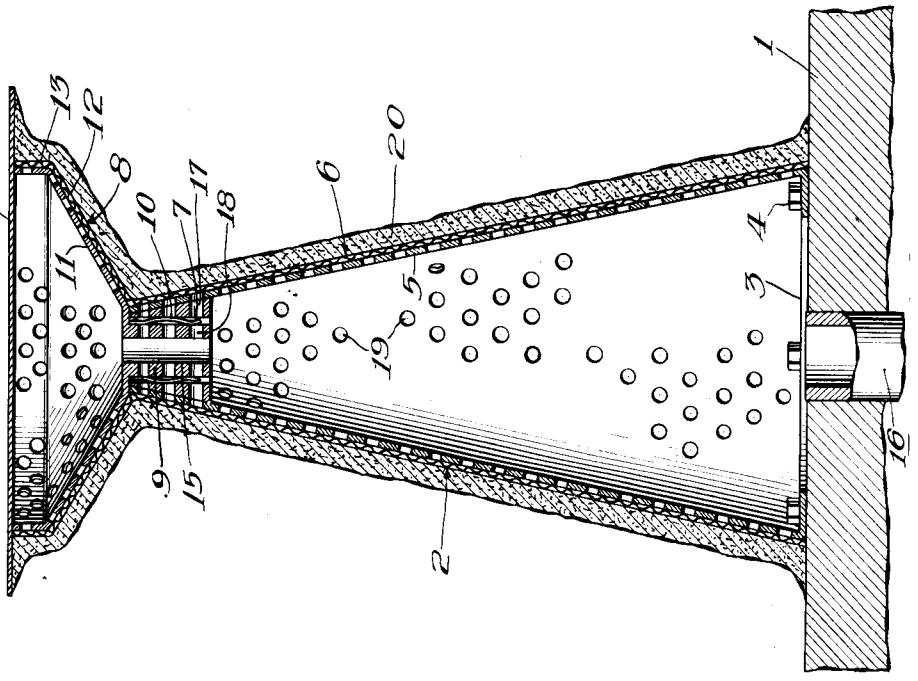


Fig. 1.



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UNITED STATES PATENT OFFICE

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METHOD OF MAKING INTEGRAL FELTED FIBROUS STRUCTURES

Original application filed April 9, 1930, Serial No. 442,963. Divided and this application filed May 20, 1931. Serial No. 538,762.

This application is a division of my copending application, Serial No. 442,963, filed April 9, 1930, issued as Patent No. 1,838,761, dated Dec. 29, 1931.

This invention relates to a method of producing a felted fibrous receptacle, and refers specifically to the production of a felted fibrous structure having an inwardly tapering body and an integral flaring base or support.

The utility of the invention and the objects and advantages thereof will be apparent from the accompanying drawing and following detail description.

In the drawing, Fig. 1 is a sectional elevation illustrating particularly the separable frame upon which my fibrous structure may be felted.

Fig. 2 is a vertical elevation, partly in section, of my finished product.

Referring in detail to the drawing, 1 indicates a base or support which may comprise a portion of the peripheral surface of a felting wheel adapted to be rotated in a trough (not shown), containing a solution of fibrous pulp. A frame 2 provided at its lower end with an annular flange 3 may be mounted upon the upper surface of support 1 by means of bolts 4 or the like. If desired, the frame 2 may comprise a foraminated cone 5, mounted upon the surface of which may be a screen 6. The upper portion of the structure 2 may be provided with an axially disposed opening 7.

A frustro-conical frame 8 may be mounted upon the apex of frame 2 and may be provided with an extension 9 adapted to be inserted in opening 7. To provide firm contact between the extension 9 and the walls of the opening 7, a plurality of leaf or blade springs 10 may be mounted upon the external surface of the projection 9 and are adapted to contact the inner surface of opening 7.

The frame 8 may comprise a foraminated supporting structure 11 having a screen 12 upon its outer surface. The flaring end 13 of frame 8 may be provided with an imperforate closure 14. An aperture 15 disposed centrally within the projection 9 may connect the interiors of frames 2 and 8.

The support 1, instead of being a portion of the peripheral surface of a felting wheel, may comprise, if desired, any portable supporting member capable of permitting the insertion of the frame 2 and 8 into a pulp solution.

A pipe 16 may be disposed in the support 1 and may connect into the interior of frame 2. It can readily be seen that by this arrangement a condition of partial vacuum may be established within frame 2, and due to the connecting conduit 15 a partial vacuum may also be established within frame 8.

In order to subject the surface of screen 6 to the action of the vacuum within conduit 15, registering apertures 17 and 18 may be provided in the apex of frame 2 and projection 9.

In carrying out my invention, frame 2 may be mounted upon support 1 by means of bolts 4, or the like, and projection 9 of the frame 8 may be inserted in the opening 7. The entire structure comprising frame 2 and frame 8 may then be inserted in a pulp solution and a condition of partial vacuum may be established within both of said frames by means of suction through pipe 16.

Due to the reduced pressure within the frames 2 and 8, the pulp comprising the pulp solution will be drawn to the surface of said frames and the suspended fibrous material will cling or adhere to the outer screens 6 and 12, whereas the major portion of the water in which the fibrous shreds are suspended will pass through said screens and through apertures 19 in the supporting structures 5 and 11.

It has been found by experience that by the provision of suitable vacuum within frames 2 and 8, approximately 97% of the water in the pulp solution will pass through apertures 19, leaving a deposited coating of fibrous material 20 upon the outer surface of said frames, having a water content of 65% to 75%.

When a desirable quantity of fibrous material 20 has accumulated upon the surface

of screens 6 and 12, air under pressure may be applied through pipe 16 to the interiors of frames 2 and 8, thereby tending to remove the fibrous coating 20 as a unit from the frame 2 and simultaneously remove the frame 8 out of contact with the inner surface of said fibrous structure 20.

If desired, the accumulated fibrous material 20 may be dried upon the frames 2 and 8 before the above mentioned separation is brought about, or said separation may take place while the accumulated coating 20 still contains the 65% to 75% water content.

In the forming of the fibrous material, a rough, irregular surface 21, resembling the bark of a tree, is produced. No further processing is necessary to produce this bark simulation since this action takes place as a physical feature of forming of pulp on a cylindrical form.

Heretofore it has been deemed substantially impossible to produce an integral fibrous structure having a restricted intermediate section and an outwardly flaring base by means of felting due to the inherent difficulties involved in withdrawing the felting frames. As has been hereinbefore described, by means of my invention, this problem has been efficiently and completely solved.

The finished product, if desired, may be constructed in the form of a base 22, the rough, irregular bark-like exterior being painted or enameled in various colors to suit the artistic sense. To provide greater stability for the base-like structure, the lower portion thereof may be filled with a plastic material 23, such as plaster of Paris, asphalt, or the like.

It is to be understood, of course, that I do not wish to limit my invention to the exact geometrical structure shown, inasmuch as I contemplate broadly the production of an integral felted fibrous structure or receptacle having a relatively restricted intermediate portion and an outwardly flaring base.

I claim as my invention:

1. A method of making a felted fibrous structure having a comparatively restricted section intermediate its height which comprises depositing fibrous material in pulp form upon curvilinear surfaces, removing the liquid carrier of said pulp and subsequently removing said surfaces from said felted structure along the longitudinal axis of said structure in directions away from said restricted section.

2. A method of making a felted fibrous structure having a comparatively restricted section intermediate its height which comprises depositing fibrous material in pulp form upon curvilinear surfaces, removing the liquid carrier of said pulp and subsequently removing said surfaces from the interior of said felted structure along the longitudinal axis of said structure in directions away from said restricted section.

In testimony whereof I affix my signature.

RICHARD E. HALL.