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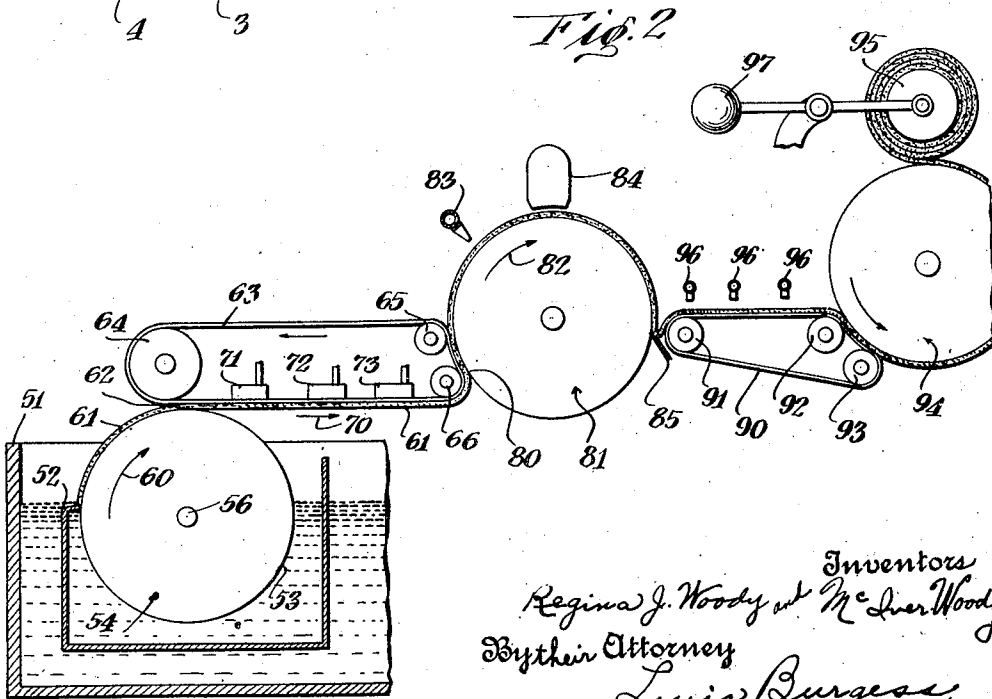
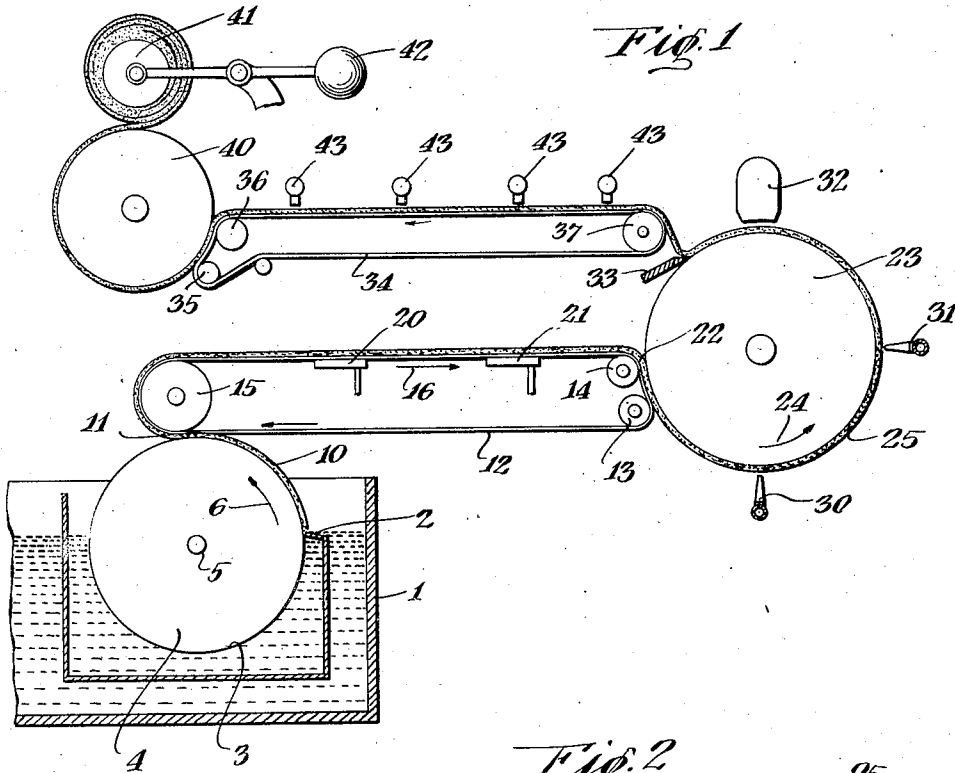
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ANTISEPTIC ABSORBENT AND PROCESS FOR THE MANUFACTURE OF THE SAME

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2 Sheets-Sheet 1



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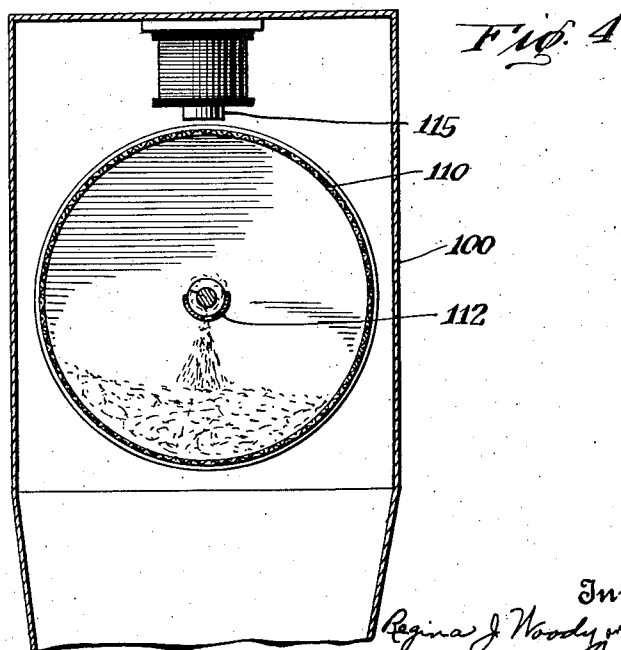
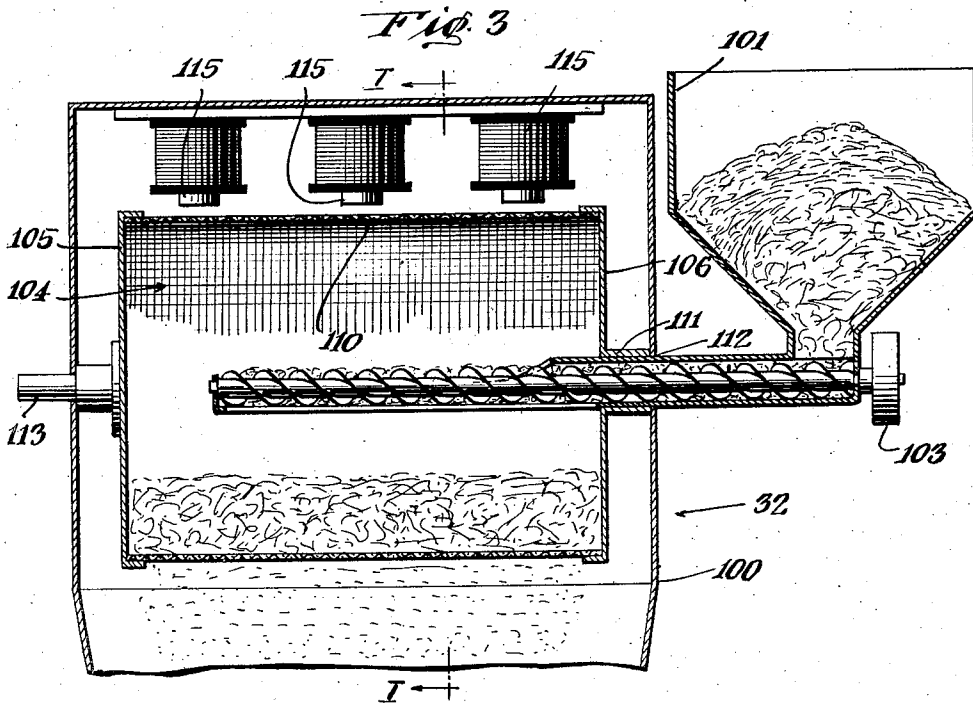
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# UNITED STATES PATENT OFFICE

1,935,170

## ANTISEPTIC ABSORBENT AND PROCESS FOR THE MANUFACTURE OF THE SAME

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Application February 3, 1931. Serial No. 513,138

11 Claims. (Cl. 92—41)

An absorbent batting for surgical dressings, sanitary napkins and the like, may be formed as a laminated structure by the super-position of a plurality of webs or sheets of cellulosic fibre. The individual sheets of which the batting is composed may be formed in a paper making machine in accordance with the well developed art. In this case, relatively little sizing is used, and the sheet or web so formed is composed of fibres lying in random direction to form an open mesh web of capillary absorbent power. When webs of this type are laid together a batting of excellent absorbent power and capacity is the result.

For many purposes it is desirable or necessary that the batting possess definite antiseptic properties either to prevent the spread of infection or to inhibit bacteria growth and consequent changes which would result in the development of odorous and/or irritant substances.

One particular utilization of a batting of this type is as the replaceable filler in a diaper assembly, more fully shown and described in prior application, Serial No. 469,739 filed July 22, 1930. In this case, a batting of relatively cheap material and of appropriate form is employed in combination with an outer supporting envelope, preferably impervious as an infant's diaper. The filler being relatively cheap is discarded after use. In this manner, the development of colonies of bacteria, particularly of the type giving rise to diaper rash, is substantially prevented; it is, however, a further advantage to have the filler properly charged or impregnated with antiseptic material; and this has the further specific advantage that it will operate to heal a previously acquired case of diaper rash.

In all of these cases it is particularly important that the antiseptic employed be distributed throughout the absorbent batting in such a manner that it cannot migrate from or concentrate in any part of the batting and further in such a manner that it becomes immediately released and effective when contacted with absorbed material.

The bandages, napkins and fillers must, moreover, be prepared by machine in large scale production, and it is a further desideratum that during such preparation the antiseptic is not lost or displaced. After manufacture of the complete individual absorbent pad, it is further necessary that the antiseptic be firmly retained during packing, transportation and storage.

We have devised a particularly expeditious and economical method, whereby the foregoing may

be accomplished. This may be conveniently illustrated by reference to the drawings, in which,

Fig. 1 is a diagrammatic vertical section through a form of apparatus in which my antiseptic absorbent may be fabricated.

Fig. 2 is a diagrammatic vertical section through an alternative form of apparatus.

Fig. 3 is a vertical section through a part of the apparatus shown in Figs. 1 and 2, and

Fig. 4 is a vertical section through the construction shown in Fig. 3, on the plane indicated by the line I—I.

Referring particularly to Fig. 1, 1 is a stock-box suitably charged with paper pulp stock. This pulp carries considerable water in proportion to the fibre and a relatively small quantity of sizing so as to be adapted to form an open mesh absorbent web. The pulp passes over the making board 2 onto the surface 3 of the cylinder 4. The cylinder 4 is rotatably carried by the shaft 5 which in turn is supported by suitable journals not shown and is equipped to rotate in the direction indicated by the arrow 6. The face 3 of the cylinder 4 may be composed of perforated sheet metal or similar pervious construction, and suitable means is preferably provided to maintain suction on the hollow interior of the cylinder 4. Inasmuch as the details of the pulp box and making cylinder are well known in the paper making profession, a more detailed description is not required. By rotating the cylinder 4 in the direction indicated by the arrow 6 and passing a suitable supply of pulp stock over the making board 2, the web 10 of open mesh absorbent material is built up on the face of the making cylinder 4. At the point 11 the web meets the apron 12, carried by the rolls 13, 14 and 15, and is transferred to the apron. It travels with the apron in the direction indicated by the arrow 16 and the excess moisture is removed during transit by means of the suction boxes diagrammatically indicated at 20 and 21. At the point 22 the web is transferred to the drying roll 23 which travels in the direction indicated by the arrow 24 carrying the web on its external surface 25. The water is principally removed by the drying roll, and during this stage the individual fibres composing the relatively thin web are well exposed.

We have found that by the use of a relatively involatile antiseptic and by applying the same to the web carried by the drying roll during the drying operation, we are enabled to cause the antiseptic to cement or attach itself to the individual fibres composing the web in such a manner as to insure the desired distribution and firm

retention of the absorbent during the subsequent fabrication and use of the absorbent batting. We may, for example, apply the absorbent as a spray, utilizing for this purpose the nozzles diagrammatically indicated by 30 and 31, or either of the same. Although we have shown only one nozzle in side elevation, it will be understood that a continuous series of nozzles extending across the width of the roll may be provided in such a way that the material ejected from each nozzle overlaps the material ejected from adjacent nozzles in case where a uniform distribution of antiseptic across the face of the drying roll is desired. In case, however, it is desired to focus the antiseptic in streaks longitudinally with respect to the web, the nozzles will be suitably spaced one from the other so as to provide lines or streaks along which the antiseptic is concentrated and intermediate lines or streaks along the web which are relatively free from antiseptic. The preferred antiseptic, both from the point of view of ease and economy of application and firmness of retention, is boric acid, and the solution of the same may be supplied by means of the said nozzles. We find it of advantage, however, to employ a powdered antiseptic which may be dusted onto the surface of the roll by means of a distributing apparatus such as diagrammatically indicated by the numeral 32, and to be hereinafter more fully described. It will be similarly understood that where a uniform distribution of the antiseptic over the face of the web is desired, the apparatus 32 will extend across the entire width of the drying roll, and conversely, where it is desired to lay the antiseptic in lines or streaks longitudinally with respect to the web, a number of distributing apparatus may be similarly employed which are spaced one from the other and so distributed with respect to the width of the drying roll as to apply the antiseptic only along the lines or streaks on which application is desired. A powdered antiseptic of this character is preferably applied adjacent the termination of travel of the web upon the drying roll and at a point such that the moisture remaining in the web is just sufficient to cause the softening and cementing of the powdered antiseptic to the surface of the individual fibres. This may readily be determined by inspection. If applied too late, the powdered antiseptic will not be firmly retained by the fibre; and if applied too early, may be irregularly distributed in an undesirable manner. The distributing apparatus 32 is preferably placed over the upper surface of the roll so that the powdered antiseptic can drop directly onto the surface of the web. The web is doctored from the drying roll by means of the doctor-knife 33, and is transferred, thence, by means of the apron 34 carried by the rolls 35, 36 and 37 to the winding roll 40 from which it is transferred to the reel 41. The reel 41 is preferably suitably counter-balanced by the weight 42, or otherwise supported to permit the building up of a plurality of webs thereupon to form the finished laminated batting which when fully formed is cut and stripped from the reel. It will, of course, be understood that alternative methods of forming the batting may be employed. We may, for example, use a plurality of reels, and by feeding webs simultaneously from said plurality of reels combine the same to form an extensive sheet of batting. Any other method known to the art may be correspondingly employed to form a batting from the webs delivered by the drying roll. It is sometimes desirable to leave a small amount of water in the web doctored from the drying roll 23

to facilitate doctoring, and in this case the drying may, if desired, be completed by passing air (preferably preheated) over the surface of the web by means of the nozzles 43.

Referring now to the apparatus shown in Fig. 2, the pulp may be stored in the pulp box 51 from which it passes over the making board 52 to the face 53 of the cylinder 54 carried by the shaft 56. In this case, the cylinder moves in the direction indicated by the arrow 60, thereby forming a web 61 which at the point 62 meets the apron 63 of felt or similar material carried by the rolls 64, 65 and 66. The apron moves with the cylinder 60 in the direction indicated by the arrow 70, thereby carrying the web 61 along the under surface of the apron 63. Excess moisture may be removed during passage by means of the suction boxes 71, 72 and 73. The web is transferred at the point 80 to the drying roll 81 which moves in the direction indicated by the arrow 82. If the antiseptic to be applied is in solution, it may be discharged onto the web by means of the nozzle 83. Alternatively, if a powdered antiseptic is employed, it may be dusted onto the face of the web by means of the distributing apparatus 84 similar to 32 hereinbefore described. The web is doctored from the drying roll by means of a doctor-knife 85 and carried, thence, by means of the apron 90 supported by the rolls 91, 92 and 93 to the winding drum 94 by which it is wound upon the roll 95. If desired, drying may be completed by the ejection of air (preferably preheated) from the nozzles 96. The finished batting may be cut and stripped from the reel 95 for fabrication into finished products.

Referring now to Figs. 3 and 4, the dusting or powder distributing apparatus 32 comprises the casing 100. The powdered antiseptic is held in the hopper 101 and is fed preferably continuously by means of the helical conveyor 102 actuated through the pulley 103 by suitable means not shown. The powdered antiseptic discharges into the interior of the drum 104. This comprises the ends 105 and 106 and the cylindrical surface 110 carried thereby which may be formed of wire mesh or similar screening material with relatively fine openings, say of the order of 100 mesh. The drum 104 is journaled at the end 111 to the casing 112, and at the other end is connected to the shaft 113 which may be rotated by suitable means not shown. The gradual rotation of the drum 104 liberates a shower of finely divided powdered antiseptic which drops gradually down within the casing 100 to find lodgement uniformly upon the surface of the web carried by the drying roll. It is a further advantage to vibrate or shake the cylinder 104 to prevent clogging of the pores of the screen 110 with the absorbent material. Where the screen 110 is composed of iron or steel this is conveniently accomplished by means of magnets such as 115 which may be actuated either by alternating current or by an interrupted direct current.

As previously stated, the preferred antiseptic for our purpose is boric acid, and we have found that particularly favorable results are obtained by the use of about 1.4 milligrams of the boric acid per cubic inch of the absorbent material which is about equal to 0.7 milligrams per square inch of absorbent material in the thickness ordinarily employed.

For many purposes a uniform distribution of the antiseptic is desired throughout the mass of the finished batting, and this may be conveniently obtained by the operation of the method

and apparatus hereinbefore described. For certain other purposes, however, it is desirable that the antiseptic be focused along certain lines of the finished batting. This effect may be conveniently obtained by the use of a plurality of nozzles or dusting devices which extend across the width of the drying roll and are spaced apart from one another. In this case the antiseptic will be focused longitudinally along streaks in the finished batting formed by superimposing a plurality of webs, the location and spacing of the streaks being predetermined by the relative position of the nozzles or dusting machines.

The antiseptic batting formed is excellent material for the fabrication of fillers to be used in diaper assemblies, such as those described in abovementioned prior application. For this purpose the finished batting is preferably so cut that the concentration of absorbent is greatest along the longitudinal axis of the filler where the amount of matter absorbed during use is ordinarily at a corresponding maximum.

The foregoing description is for purposes of illustration and not of limitation, and it is therefore our intention that the invention be limited only by the following claims or their equivalents in which we have endeavored to claim broadly all inherent novelty.

We claim:

1. Process of forming an antiseptic absorbent, which comprises forming a web of cellulosic fibres, transferring the web so formed to a drying roll, and while in contact with the said drying roll distributing antiseptic over the exposed surface of said web in the presence of sufficient moisture to cause the antiseptic to cement itself directly to the fibres composing said web.

2. Process according to claim 1, in which the antiseptic comprises boric acid.

3. Process of forming an antiseptic absorbent, which comprises forming a web of cellulosic fibres, transferring the web so formed to a drying roll, and while in contact with the said drying roll uniformly distributing antiseptic over the exposed surface of said web in the presence of sufficient moisture to cause the antiseptic to cement itself directly to the fibres composing said web.

4. Process according to claim 3, in which the antiseptic comprises boric acid.

5. Process of forming an antiseptic absorbent, which comprises forming a moist web of cellulosic fibres, transferring the web so formed to a drying roll, partially drying the web carried by said drying roll, and while in contact with the said drying roll distributing a powdered antiseptic over the exposed surface of said web at a point at which the moisture content is sufficient to cause the applied antiseptic to cement itself to the fibres composing the said web.

6. Process according to claim 5, in which the antiseptic comprises boric acid.

7. Process of forming an antiseptic absorbent, which comprises forming a moist web of cellulosic fibres, transferring the web so formed to a drying roll, and while in contact with the said drying roll uniformly distributing a powdered antiseptic over the exposed surface of said web at a point at which the moisture content is sufficient to cause the applied antiseptic to cement itself to the fibres composing the said web.

8. Process according to claim 7, in which the antiseptic comprises boric acid.

9. Process of forming an antiseptic absorbent, which comprises forming a web of cellulosic fibres, transferring the web so formed to a drying roll, revolving the said roll and thereby carrying the web through at least a part of the upper path of the surface of said drying roll, while in contact with the said drying roll dusting a powdered antiseptic onto the web carried by the said drying roll in the presence of sufficient moisture to cause the antiseptic to cement itself to the fibres composing the said web.

10. Process according to claim 9, in which the antiseptic is boric acid.

11. Process of forming an antiseptic absorbent, which comprises forming a moist web of cellulosic fibres, transferring the web so formed to a drying roll, revolving the said roll and thereby carrying the transferred web through at least a part of the upper path of the surface of said drying roll, dusting a powdered antiseptic onto the web carried by the said drying roll at a point at which the moisture content is sufficient to cause the antiseptic to cement itself to the fibres composing the said web.

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