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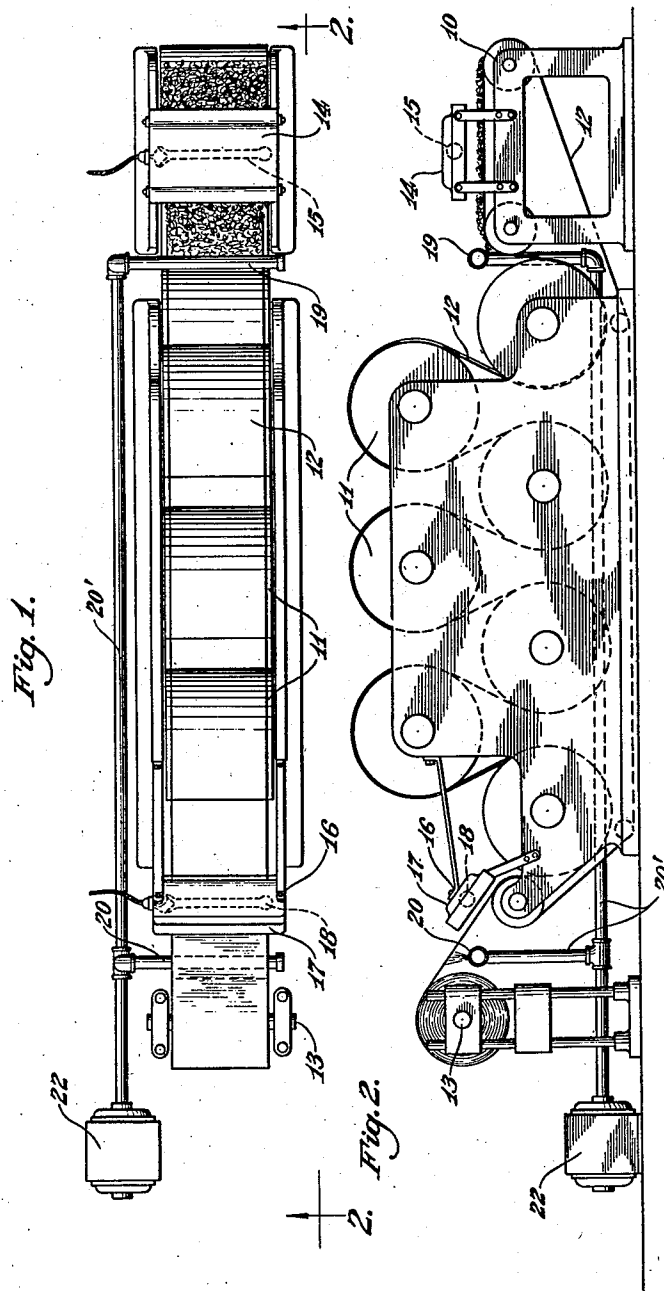
W. R. REDD

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METHOD OF TREATING AND SEASONING PAPER

Filed Dec. 3, 1931

2 Sheets-Sheet 1



William Russell Redd.
INVENTOR

BY Victor J. Evans & Co.

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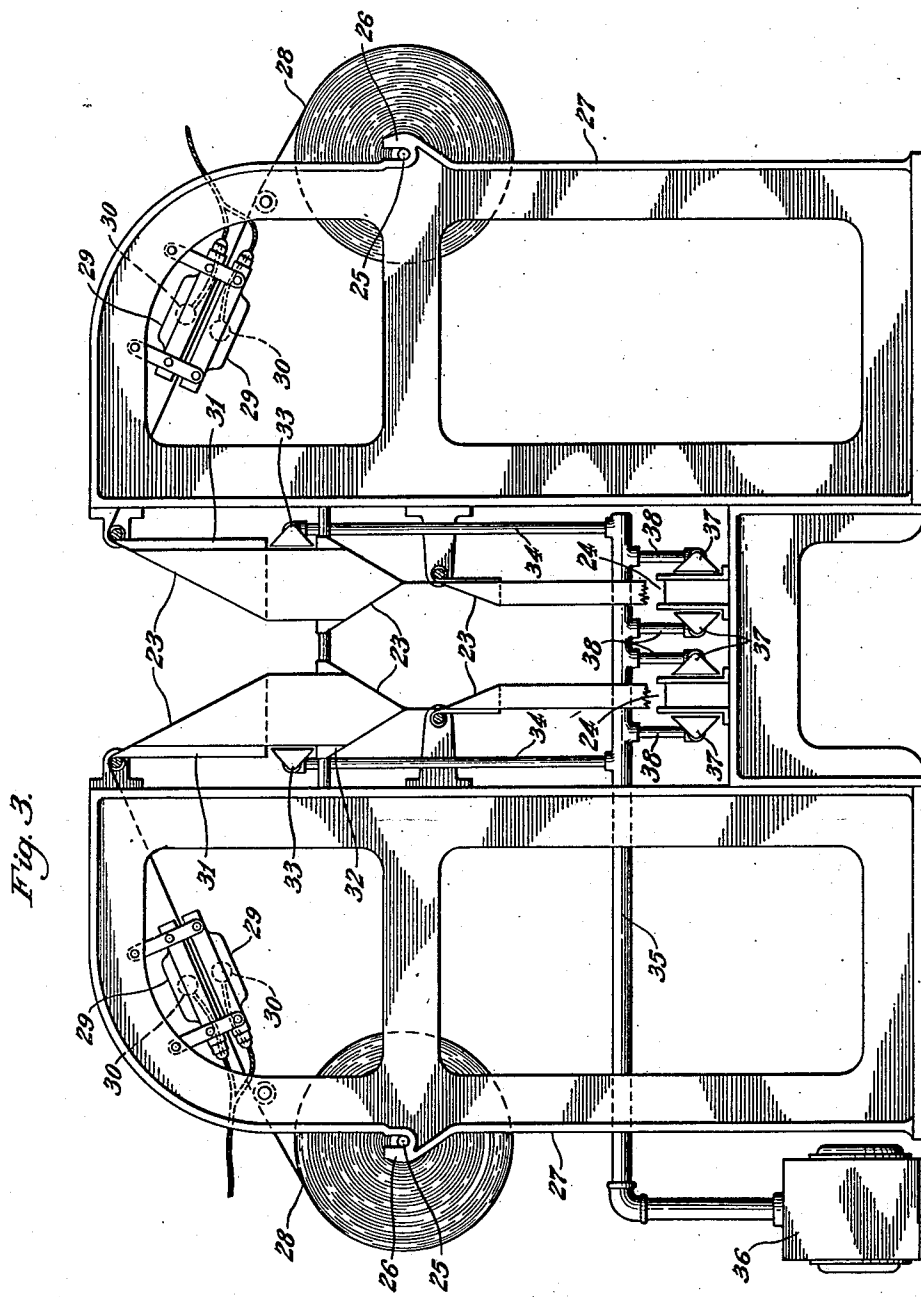
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METHOD OF TREATING AND SEASONING PAPER

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UNITED STATES PATENT OFFICE

WILLIAM RUSSELL REDD, OF WESTERN SPRINGS, ILLINOIS, ASSIGNOR TO NATIONAL PAPER NAPKIN MFG. COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS

METHOD OF TREATING AND SEASONING PAPER

Application filed December 3, 1931. Serial No. 578,771.

My invention relates to a certain method of treating and seasoning paper, and has for its principal object the provision of an improved art of bleaching, sterilizing, and deodorizing paper especially to be converted into articles of manufacture such as paper napkins and towels.

In the manufacture of paper, especially with reference to the manufacture of paper from wood pulp or like substance, there results from the pulp mixing operation a slush water which discolors and odorizes the finished paper web, rendering the paper distasteful in color and odor, thereby lessening its value for use in the manufacture of paper napkins and towels, and consequently necessitating expensive operations for thoroughly sterilizing, bleaching, and deodorizing the web before conversion into napkins, towels, or like articles.

There is also present in the paper web manufactured from wood pulp or like substance a wood-like or rosin-like odor, which if not removed is offensive when such paper is converted into and used as paper napkins and towels. It is, therefore, one of the many objects of this invention to provide a simple and inexpensive method for effectively sterilizing, bleaching, and deodorizing the wood pulp and finished paper web in a manner as will permit the production of paper having a natural bleach and free from the usual and offensive odors, especially the odor of rosin and the usual chemicals used for bleaching purposes.

My invention also has for its object the improved art of sterilizing, bleaching and deodorizing without the use of the usual chemicals ordinarily used for this purpose, thereby rendering the paper napkins and towels free from bleaching and deodorizing chemicals which might be irritable to the skin.

Other objects will appear hereinafter.

The invention will be best understood by reference to the accompanying drawings showing the preferred application of my invention, and in which:

Fig. 1 is a plan view of a paper manufacturing machine illustrating my improved method associated therewith;

Fig. 2 is a typical side elevational view of the same; and

Fig. 3 is a typical side elevational view of a paper converting machine likewise showing my improved method associated therewith.

My improved method for treating and seasoning paper may be associated with paper making machines as well as paper converting machines of any well known design and construction.

In this connection in Figs. 1 and 2 I have shown in a general way a paper making machine including a receiving end 10 which receives the wood pulp to be pressed into a paper web by rollers 11 upon the continuous conveyor belt 12 from which the paper is wound in roll form upon a spindle 13. At the receiving end of the paper making machine, in close proximity to the belt 12, I mount in any suitable manner a canopy 14, which canopy 14 has an inner reflector surface and is intended to provide a housing for an ultra-violet ray lamp 15, the rays from which lamp are directed by the reflector surface of the canopy upon the wood pulp.

At the discharge end of the machine adjacent the paper roll on the spindle 13 I mount, as at 16, in any suitable manner another canopy 17 having an inner reflector surface and likewise designed to provide a housing for an ultra-violet ray lamp 18, the rays of which are reflected down upon the surface of the web of paper prior to the time it is rolled upon the spindle 13.

The rays from both of the ultra-violet lamps mainly function to bleach the paper pulp and finished web removing therefrom the rusty or slush water discoloring which results from the mixing operation of the wood pulp. These rays are also germicidal in character, but as I have found that the rays from an ultra-violet ray lamp do not completely penetrate through the body of the paper web, I have associated with the machine other means for destroying bacteria and principally for deodorizing the paper pulp and the paper web formed from such pulp.

In carrying out this object of my inven-

tion, I subject the pulp and finished paper web to sprays of ozone which have the effect of deodorizing the wood pulp and the paper web, and as ozone is destructive to bacteria, the ozone in this respect carries forward the function of the rays from the ultra-violet lamps.

To accomplish this I mount at the receiving end of the machine adjacent the canopy 14 a spray jet 19 which is designed to direct a spray of ozone upon and through the paper web as it leaves the receiving end of the machine. Likewise adjacent the spindle upon which the paper web is rolled I provide a spray jet 20 designed to direct a spray of ozone upon and through the paper web in a direction opposite the direction of the spray of ozone from the jet 19. Both of these spray jets receive the supply of ozone from a supply conduit 20' communicating with an ozone generator 22 of any approved type.

By this arrangement it is manifest that the paper pulp, as well as the paper web, is sterilized, bleached, and deodorized before the paper is wound upon the spindle 13 by a simple and inexpensive method in which none of the usual bleaching or deodorizing chemicals is used.

In Fig. 3 of the drawings I have illustrated my improved method associated with a paper converting machine such as is illustrated in United States Letters Patents Nos. 1,719,833 dated July 9, 1929; 1,613,505 dated January 4, 1927, and 1,548,626 dated August 4, 1925, to which patents reference may be had for a detailed description of the structure and operation of the paper converting machine.

In this connection the paper converting machine illustrated in Fig. 3 of the drawings includes a plurality of fold members 23 and receiving troughs 24, the latter of which receive the finished folded article.

The paper fed to these fold members is of a continuous nature and is in roll formation, the rolls being supported in any approved manner, such as, for example, by means of shafts 25 supported by suitable bracket structures 26 provided by the frames 27 of the machine. As the web leaves the rolls indicated at 28, the web is passed between two opposing reflector canopies 29, each of which provides a housing for an ultra-violet lamp 30. The rays from the lamp are directed upon the opposite sides of the web as shown.

The paper after passing between the reflector canopies is passed through a zone of ozone, which zone in the present instance is confined between the first and second fold members of the machine, indicated respectively at 31 and 32. The ozone is supplied by means of a spray pipe 33 having connection with a supply conduit 34 communicating with a main feed pipe 35 leading to an ozone generator 36 of any approved structure.

The converted paper article, which in the

present instance is a napkin, is again subjected to an ozone treatment, and this is accomplished by disposing on opposite sides of the receiving troughs 24 ozone spray pipes 37 which have communication with the main feed pipe 35 by means of branch pipes 38.

By this last application of the ozone to the finished article, the finished article is given a final treatment to deodorize any remaining odor of the wood pulp or like substance and to destroy any remaining bacteria.

In the application of my improved method of sterilizing, bleaching, and deodorizing paper pulp or the finished paper web, it is apparent that I do not employ for this purpose chemicals, and consequently the finished paper web is free from any injurious chemicals which might otherwise be harmful to the skin when the paper web is converted into and used as paper napkins and towels.

The intensity of the light rays from the ultra-violet lamps is determined by considering the speed of travel of the paper web and the distance of the lamps therefrom so that the intensity will be of a proper degree to obtain the best results.

Having thus described my invention, what I claim as new and desire to protect by Letters Patent is:

1. The improvement in the art of sterilizing, deodorizing and bleaching paper to be converted into paper napkins or like articles, which consists of subjecting a moving paper web to ultra-violet rays and then passing said web through an atmosphere of ozone.

2. The improvement in the art of bleaching, sterilizing and deodorizing paper to be converted into paper napkins and towels which consists of subjecting paper pulp in transit to ultra-violet rays and ozone successively, converting the pulp to paper web, and then passing the paper web through a zone of ultra-violet rays and an atmosphere of ozone successively.

In testimony whereof I affix my signature.
WILLIAM RUSSELL REDD.