Jan. 5, 1932. H. W. JESPERSEN 1,840,102

APPARATUS FOR CLEANING ARTICLES

Filed Jan. 2, 1929

Fig. 1.

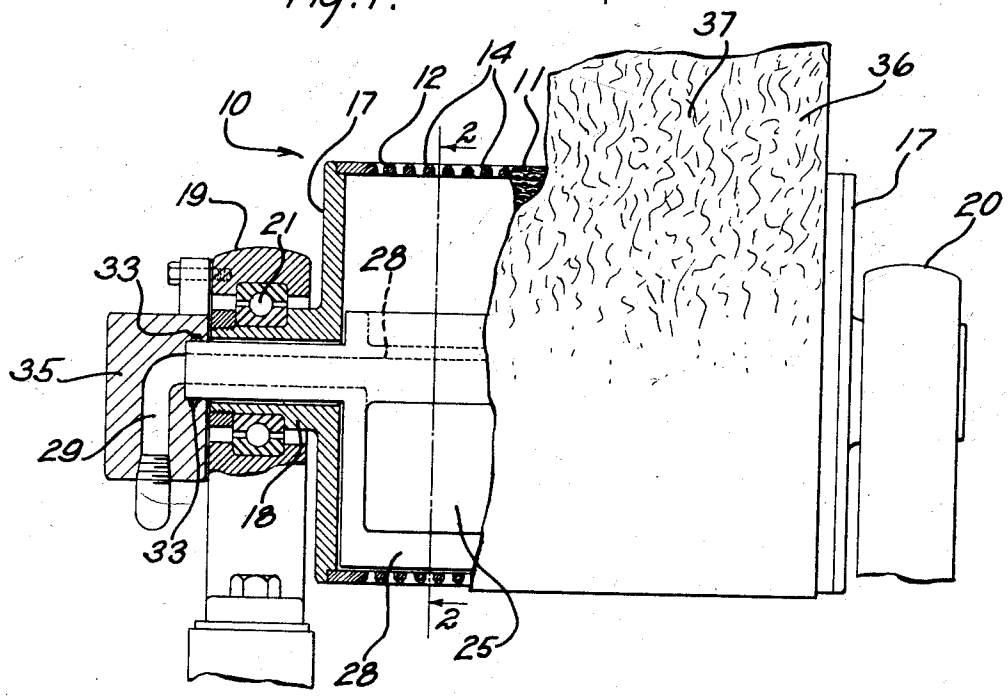
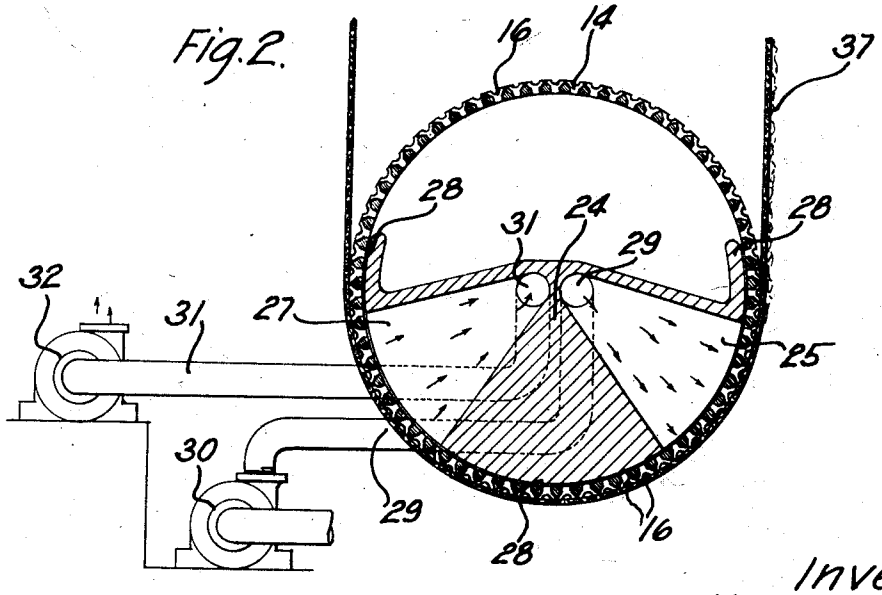


Fig. 2.



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UNITED STATES PATENT OFFICE

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APPARATUS FOR CLEANING ARTICLES

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This invention relates to an apparatus for cleaning articles, and more particularly to apparatus for cleaning flexible belts used in paper making machines.

In depositing pulp insulation directly upon wire cores, it has been the custom, in some instances, to employ moving belts of felt on which the pulp covered cores are carried. After a period of operation it is usually necessary to remove from the felt an accumulation of fibrous matter deposited thereon by association with the pulp covered cores, and it has been the practice in some instances to remove the particles of pulp by saturating the felt with water and subjecting it to the action of whipping arms, subsequently passing the felt over a suction box to remove the excess moisture.

An object of the present invention is to provide means for adequately cleaning a flexible article with a minimum amount of wear thereon.

One embodiment of the invention contemplates the provision, in a wire insulating machine employing a felt web for supporting wires and their attached coatings of pulp, of a rotating perforated cylinder around which the felt is carried. The cylinder surrounds a stationary center member having two chambers therein, the first of which, in the order of their engagement with the felt, subjects the felt to water under pressure to free it of collected fibres and the second of which subjects the felt to suction to remove the excess moisture therefrom.

A better understanding of the invention may be derived from the following detailed description read in connection with the accompanying drawings forming a part thereof, and in which

Fig. 1 is a diagrammatic fragmentary elevation of a felt cleaning device embodying the features of the invention, and

Fig. 2 is a section taken on the line 2—2 of Fig. 1 and includes a diagrammatic showing of an apparatus for producing forced currents of air and water.

Referring now to the drawings in which similar parts throughout the views are indicated by identical reference numerals, a cleaning device generally denoted by the numeral 10 is shown having a cylindrical drum 11, with a surface 12 having funnel shaped perforations 14 regularly arranged thereon in transverse rows. Extending across the surface of the drum with each row of perforations, there is a transverse groove 16. The drum also includes oppositely disposed end portions 17—17 and a hollow axle 18 which extends beyond each end of the drum and is journaled in end housings 19 and 20 by suitable roller bearings 21. Located within the cylindrical member 11 is a stationary member comprising a frame 24 and an associated pressure chamber 25 and a suction chamber 27. A portion of the framework contiguous to the underside of the drum surface 12 constitutes bearing portions 28, and is accurately machined and closely fitted to the underside of the surface. A water duct 29 is connected with the pressure chamber 25 and a force pump 30 is connected to the water duct 29 for furnishing a flow of water under pressure to the pressure chamber 25. At the end of an air pipe 31 a suction fan 32 is provided for maintaining a partial vacuum in the suction chamber 27. A stationary member is secured by bolts or other suitable securing means 33 in an end block 35, which forms a part of the end housing 19, for the purpose of maintaining rigidly in a stationary position the center frame member 24. A felt web 36 is shown encircling the lower portion of the drum 11 and so moving that it will rotate the drum in a clockwise direction. An accumulation of pulp fibres and other objectionable material which may cling to the belt before it is subjected to the cleaning operation is indicated by the numeral 37.

From the foregoing it may be observed

that as the felt 36 which is to be cleaned, is carried around the cylindrical drum 11, the fouled portion is first subjected to a flow of water under a heavy head of pressure outwardly from the pressure chamber 25. This water is forced outwardly through the funnel shaped apertures 12 in the surface of the drum and is diffused against every portion of the under surface of the belt by passage through the transverse grooves 16. A sufficient head of pressure is maintained in the pumping system to permit the felt to be saturated and thoroughly cleaned by the pressure of the water during the time required for the fouled portion to pass over the mouth of the pressure chamber 25. Although after passing the pressure chamber the felt is found to be quite free of accumulated débris, it is so saturated with water as to be unfit for use in a paper making machine. However, upon the continued rotation of the drum 11 the saturated portion of the felt is carried beyond the central bearing portion 28 and passed over the mouth of the suction chamber 27 and there subjected to the air pressure existing over that area caused by the partial vacuum maintained in the suction chamber. The water contained in the saturated portion of the felt is thus removed from the felt, carried inwardly through the transverse grooves 16 and the funnel shaped apertures 14 of the drum 11 through the air duct 31, and is disposed of in any suitable conventional manner not shown. The felt portion having been thus practically rid of its water content is sufficiently dry to suit it for use in the other portions of paper making machine without further treatment.

The bearing portions 28 of the stationary central frame member 24 are so machined and fitted as to insure that no loss of suction or pumping power is suffered in the boxes 25 and 27 such as might be occasioned by leakage between the bearing portions 28 and the interior surface of the drum 11. However, this result may be accomplished without imposing an objectionable burden of friction on the mechanism of the paper making machine which propels the passage of the felt.

By use of the funnel shaped apertures 14 and the transverse grooves 16, it is possible to thoroughly clean the surface of any flexible article whether same be of a porous material or of a non-porous material.

Under suitable conditions the use of the water pump 30 may be dispensed with if the pressure throughout the water system employed is sufficient to force the water outwardly through the apertures and felt with the result that adhering fibres and dirt may be washed therefrom.

The apparatus described is capable of various modifications other than that herein described and illustrated since the form shown is merely a convenient and useful one of the invention which is capable of other modifications without departing from the spirit and scope of the invention.

What is claimed is:

1. In a paper making machine, a perforated rotary cylinder, a porous belt carried by the cylinder, means centered with respect to the cylinder for producing radially and oppositely directed currents of air and water respectively, and means associated therewith for guiding the currents through the belt.

2. In a paper making machine, a perforated rotary cylinder, a porous belt carried by the cylinder, means for producing a current of air and an oppositely directed current of water, and means located interiorly of the cylinder for causing the currents to flow through the belt.

3. In a paper making machine, a continuous porous belt, a perforated rotary means for carrying the belt, and means for producing a current of air and an oppositely directed current of water and means associated therewith for causing the oppositely directed currents to flow through the belt.

4. In a paper making machine, a continuous porous belt, a perforated rotary means for carrying the belt, means for producing a current of air and an oppositely directed current of water, and means located interiorly of the cylinder for causing the oppositely directed currents to flow through and clean the belt.

5. In a paper making machine, a rotary body, a porous belt carried by the rotating body, means for producing a current of water, an associated means for producing a suction of air, and means located interiorly of the rotating body for causing the water to flow through the belt and for causing the suction means to engage the belt subsequent to its subjection to the current of water.

6. An apparatus for cleaning articles comprising a perforated cylinder for carrying the article, a center member having a plurality of chambers, and means for causing oppositely directed currents of air and liquid respectively to flow between the chambers and the cylinder.

7. An apparatus for cleaning articles comprising a perforated rotary cylinder for carrying the articles, a stationary center member therewithin having a chamber for forcing a current of liquid matter outwardly through the perforations of the cylinder, a second chamber for forcing a current of air inwardly through the perforations, means for causing a flow of liquid matter in the first chamber and means for causing a flow of air in the second chamber.

8. An apparatus for cleaning articles comprising a perforated rotary cylinder for carrying the articles, a center member having a plurality of chambers for guiding currents of fluid through the perforations of the

cylinder, and means associated therewith for creating oppositely directed currents of air and water respectively in the chambers.

9. In a paper making machine, a perforated rotary cylinder, a movable porous belt carried by the cylinder, a center member associated with the cylinder having a plurality of chambers for guiding oppositely directed currents of air and water respectively through the belt, and means for creating the currents.

In witness whereof I hereunto subscribe my name this 24th day of December, A. D. 1928.

HELGO WIGGO JESPERSEN.