

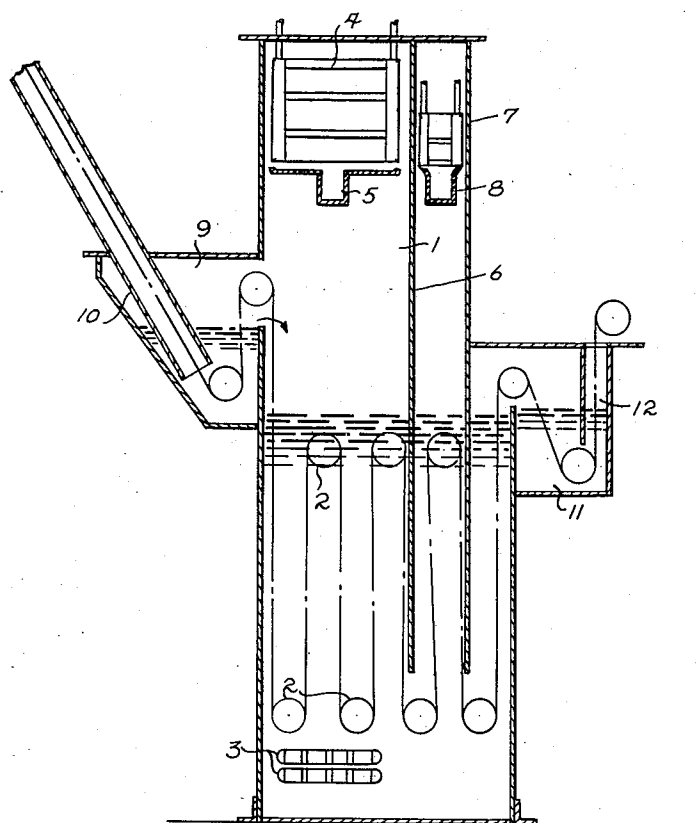
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TEXTILE TREATING APPARATUS WITH SOLVENT RECOVERY MEANS

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TEXTILE TREATING APPARATUS WITH SOLVENT RECOVERY MEANS

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2 Claims. (Cl. 68—9)

This invention relates to the treatment of textiles and more particularly to a novel apparatus in which lengths of textile material can be treated in a continuous operation.

Many multi-stage continuous processes are known in which lengths of textile fabric such as cotton and woolen materials and the like are passed continuously through a succession of treatment stages wherein various reagents or solvents are applied to and subsequently extracted from the material.

In some cases treatment of the fabric requires at one stage the application of a volatile organic solvent such as, for example, trichloroethylene or perchloroethylene to extract fats or waxes from the material, and this stage may be followed by treatment with an aqueous fluid to remove the solvent absorbed by the fabric in the previous stage.

In the progressive movement of lengths of textile material from one stage to the next there frequently arises difficulty in preventing vapours of volatile solvents or steam escaping from the chamber when treatment of the fabric has to be undertaken at temperatures at or near the boiling point of the liquid contained in the chamber.

In an apparatus for the continuous treatment of textiles with volatile solvents which includes a chamber for volatile solvent recovery wherein means are provided to permit the continuous passage of textile through an aqueous medium contained within the said chamber and means are also provided to heat the aqueous medium sufficiently to flash off residual volatile solvent carried by the incoming textile, the present invention comprises a sealing device whereby the escape of volatile solvent is prevented which comprises an inlet vapour seal and an outlet vapour seal each communicating with the said solvent recovery chamber at points above the level of the aqueous medium contained within the chamber, the inlet vapour seal comprising a separate compartment and containing a quantity of the said volatile solvent below the surface of which is located the lower end of a duct through which incoming textiles may be traversed, the outlet vapour seal comprising another separate compartment and containing an aqueous medium below the surface of which is located the lower end of a duct through which outgoing textiles may be traversed.

Means are also provided within the said solvent recovery chamber for condensing the vapour of the solvent evaporated from the fabric and collecting the liquid so condensed for further use. These are conventional devices well known in themselves and forming no characteristic feature of the invention.

The invention is more particularly described with reference to the attached drawing which illustrates one suitable arrangement for carrying out the invention.

The solvent recovery chamber 1 contains aqueous solvent to the level indicated in the drawing. Incoming strips of textile after treatment with volatile solvent in a previous stage are allowed to enter the apparatus from

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the duct 10, and by means of a number of rollers 2 the textile strips are first passed through the compartment 9, containing volatile solvent.

The strips fully impregnated with volatile solvent are next passed through the bulk of aqueous solvent in the chamber which is maintained continuously at a temperature sufficient to volatilise the volatile solvent by means of the heaters 3.

After passing upwards and downwards several times over a number of rollers the strips are passed finally through compartment 12, containing aqueous solvent, and thence leave the apparatus free of all trace of organic solvent and saturated with aqueous liquid.

Arrangements for condensing and recovering volatile organic solvent in the recovery chamber are shown at 4 and 5, and at 7 and 8 in the drawing. A baffle plate 6 divides the recovery chamber into the two sections and serves to minimise the chance of any volatile solvent being carried over to the receptacle 12.

Our invention envisages many modifications and refinements of the aforescribed apparatus. In the first place the solvent recovery chamber may contain a plurality of compartments in which a succession of evaporation stages may be carried out. There may also be various means for supplying heat to maintain the temperature of the solvent recovery chamber at a prescribed temperature. It is also envisaged that appropriate cooling means may be applied to the inlet duct through which the incoming textiles are traversed.

We have found that the apparatus of our invention is eminently suitable to the treatment of fabrics in open width and is particularly applicable to the process described in United States Patent No. 2,790,699, issued April 30, 1957, wherein is described a process for the treatment of cotton piece goods for dyeing. In one method of carrying out this process the natural wax in pieces of cotton fabric is first removed by passing the pieces through a dewaxing chamber containing a volatile organic solvent, as for example trichloroethylene, maintained at its boiling point. The fabric is then passed through boiling water to flash off the solvent after which it is passed through an aqueous solution containing other reagents. The impregnated cloth is finally steamed and rinsed in baths containing respectively hot water, cold water, dilute acetic acid and cold water and is finally dried.

In the transfer of the cotton fabric from the organic solvent dewaxing stage to the stage where the solvent is flashed off there arises the difficulty of the escape of steam from the second stage to the first and also the difficulty of solvent vapour escaping from the first stage to the second. The apparatus of our invention obviates these difficulties and successfully seals off the aforementioned stages from each other and also by virtue of the outlet seal prevents the escape of organic solvents from the solvent recovery chamber to the outside of the apparatus.

What I claim is:

1. Solvent recovery apparatus comprising a closed chamber having a lower liquid retaining section at the bottom thereof and a vapor section thereabove, heating means in the liquid retaining section of said chamber, a closed inlet sealing compartment mounted on one side wall of said chamber, said wall having an inlet opening providing communication between the top of said inlet sealing compartment and the vapor section of said chamber, a downwardly directed inlet duct extending through the top of said inlet sealing compartment and terminating therein at a level below the level of said inlet opening, a closed outlet sealing compartment mounted on the opposite wall of said chamber, said opposite wall having an outlet opening providing communication between the top of said outlet sealing compartment and the vapor

section of said chamber, a downwardly directed outlet duct extending through the top of said outlet sealing compartment and terminating therein at a level below the level of said outlet opening, first fabric guiding roller means in said inlet sealing compartment below the end of said inlet duct, second fabric guiding roller means in said inlet opening, third fabric guiding roller means for progressing fabric in the liquid retaining section of said chamber, fourth fabric guiding roller means in said outlet opening, and fifth fabric guiding roller means in said outlet sealing compartment below the end of said outlet duct.

2. Apparatus as defined in claim 1, including a vertically disposed baffle plate in said chamber extending from the top thereof into the lower liquid retaining section and terminating short of the chamber bottom to divide the

vapor section into two parts, and solvent condensing and recovery means disposed in each of said vapor section parts.

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