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APPARATUS FOR TREATING TEXTILE AND LIKE MATERIALS

Filed Dec. 1, 1959

Fig. 1

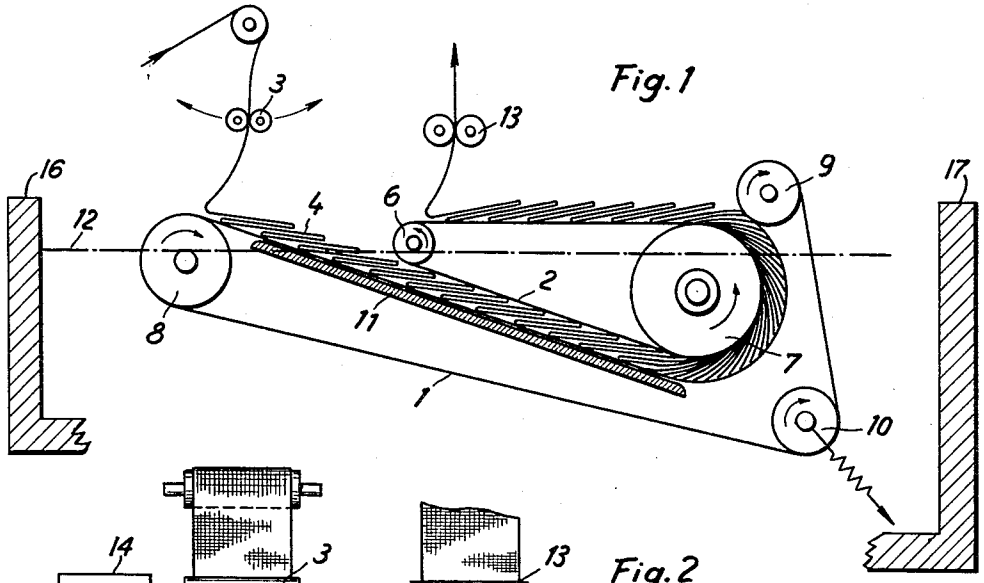


Fig. 2

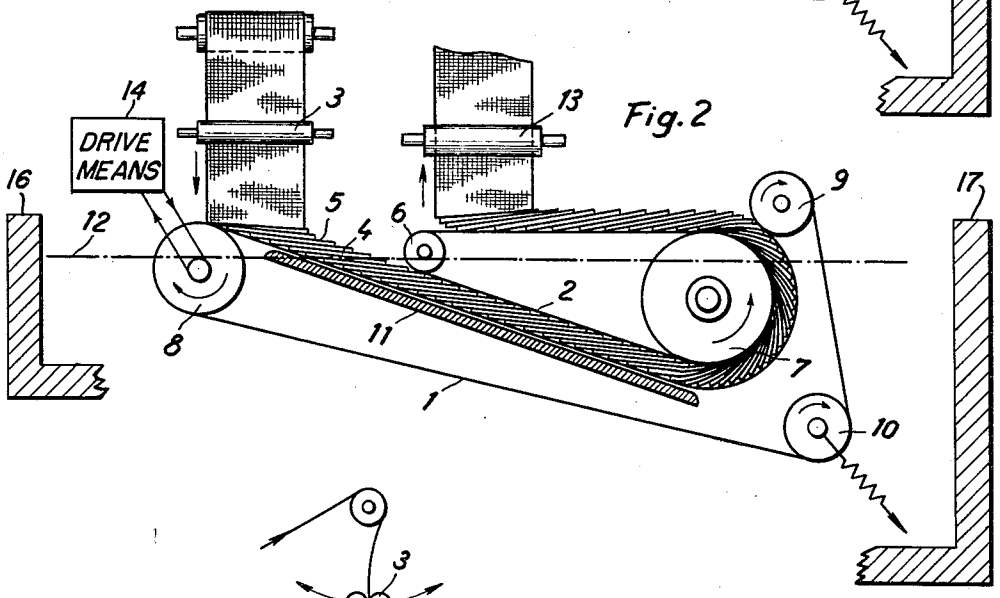
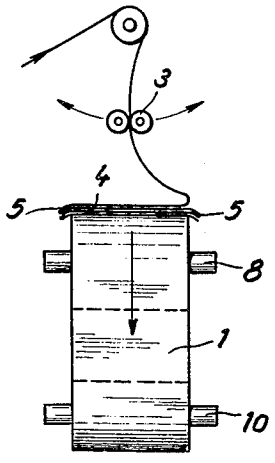


Fig. 3



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APPARATUS FOR TREATING TEXTILE AND LIKE MATERIALS

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This invention relates to improvements in apparatus for treating of textile and like materials in band or open width form in liquids, for example, washing, bleaching, boiling, de-sizing, soaking and the like or in gaseous media, for heating damping, drying of the type in which the textile material is guided through the treating medium between two endless conveyors in a folded or plaited form.

Apparatus of the aforesaid type is known in which the band or length of textile material is folded or plaited onto an endless conveyor travelling at the point where the material is folded or plaited thereonto in a downwardly oblique direction the said conveyor being associated with a second conveyor so that the folded or plaited material is located between the two conveyors and after treatment is drawn off the first conveyor. The path of the material through the treatment chamber may be lengthened by passing the conveyors over rollers to give them a zig-zag path through the chamber. The distance between the conveyor is controlled by means of suitable guides and the upper conveyor prevents the material from being driven up from the treating liquid. In such arrangement owing to the fact that the folded or plaited material only lies loosely between the two conveyors the folds or plaits can be disarranged during the upper and down travel of the conveyors. The arrangement also has the further disadvantage that the material is withdrawn from the same conveyor as that on which it is folded or plaited so that the folds or plaits tend to become further disarranged.

A feature of the present invention is that the two conveyor bands which run obliquely downwards from the folding or plaiting point or from an imaginary horizontal plane are separated from one another by a distance which is less than the depth of each fold or plait whereby the folds or plaits are held together in stack-like formation and the path of the conveyor bands is such that the material is turned over between the folding or plaiting point and the point where it is drawn off from the conveyors whereby the folds are securely held during the passage through the treating medium an dis drawn off from the upper length of each fold or plait.

Another feature of the invention consists in guiding the conveyor bands so that the distance between gradually diminishes between the point where the second band comes into association with the first band and the point where it is guided away from the latter.

The invention permits of the folding or plaiting in the direction of travel of the conveyors. A folding or plaiting transversely to the direction of travel is, however, preferred as this has the advantage that the fold lines necessary for the folding are not pressed closely between the conveyor bands which is of particular advantage with finer textile material since the folds or plaits can project beyond the edges of the conveyor bands and so avoid compression.

Preferably only one conveyor band is driven, the other band being taken along by the folded or plaited material thus ensuring that there is no relative movement between the material and one of the bands.

It is advisable to guide the conveyor bands when carrying the material by a support provided with a friction

reducing coating, thereby preventing a sagging of the band.

The conveyor bands may be of any suitable material but it is preferred to employ a glass fibre fabric with a coating on the side in contact with the material of a synthetic material insensitive to attack from the treating medium. The glass fibre fabric is insensitive to the treating medium whilst the synthetic material coating prevents the penetration of glass fibres into the material.

In order that the invention may be fully understood it will be described with reference to the embodiments illustrated diagrammatically in the accompanying drawings. In these drawings:

FIG. 1 shows in vertical section an embodiment in which the material is folded in the direction of travel of the conveyor bands.

FIG. 2 shows in vertical section an embodiment in which the material is folded to the direction of travel of the conveyor belts.

FIG. 3 is a front elevation of the embodiment shown in FIG. 2.

The apparatus which is located in a suitable container consists of the two endless travelling conveyor bands **1** and **2**, the band or length of material **4** being folded by the folder roller **3** in known manner by the folding rollers, the direction of travel of the conveyor bands being indicated by the arrows.

In FIG. 1 the folder rollers **3** fold the material **4** on the band **1** in the direction of travel. In FIG. 2, on the other hand, the folder rollers **3** fold the material on to the band **1** transversely to the direction of travel of the bands so that the folds **5** of the folded material project beyond the edges of the conveyor band **1**, as shown in FIG. 3.

Considered from the folding on point of the material **4** and the level **12** of a treating liquid which is contained in any suitable container such as that generally shown at **16** and **17** of FIGURES 1 and 2, the conveyor bands run obliquely downwards so that the folded material is carried obliquely and thereby gently into the liquid treating medium.

The distance of the two bands **1** and **2** from one another is less than the fold width or with cross folding the material width so that the folded material is held together stacked between the two bands.

The band **2** is guided over the two rollers **6** and **7** of which the roller **7** forms the return course whilst the band **1** is guided over the rollers **8**, **9** and **10** and from the folding in point or the roller **8** to the completed return course or to the roller **9** forms a free band which gradually approaches the band **2**. The roller **10** is in the form of a tension roller which gradually draws the band **1** towards the band **2**. The part of the band **1** which carries the material to the roller **7** is guided over a support **11** which is provided with a friction reducing covering resistant to attack by hte treatment medium.

Only one of the conveyor bands **1** and **2** is driven. The other being drawn along by the material. Referring to FIGURE 2, drive means, generally shown at **14**, are coupled to the shaft of guide roller **8** so as to cause the guide roller **8** to rotate thereby driving band **1** as shown by the arrow.

Each band **1** and **2** consists of a glass fibre fabric and is provided on the side in contact with the material with a coating of a synthetic material resistant to attack by the treatment medium.

As the drawing shows, the material is guided by the conveyor in a folded stack through the treatment medium and is turned over so that the underneath side of the material on the folding in end is the upper side at the draw off end. The drawing off is effected by means of draw off rollers **13** in known manner.

I claim:

1. Apparatus for treating material in the form of a band with a fluid medium comprising in combination: first and second endless bands for conveying the material through the medium; said second band having a lower reach directly over and adjacent a reach of said first band and an upper reach substantially horizontal; folder rollers for folding the material onto said first band; guide rollers for guiding said first and second bands through the medium so that the direction of travel of said adjacent reaches of said first and second bands is first obliquely downward and then upward whereby the sides of the folded material carried thereby are reversed before being drawn out of the medium; drive means for causing said first and second bands to move about said guide rollers; tension means for exerting a force on said first band whereby the distance between said first and second bands gradually diminishes between the point where said second band moves directly over and adjacent to said first band and the point where said second band moves away from said first band; support means for supporting said first band obliquely downward through the medium; and withdraw rollers for drawing off the treated material.

2. Appartus for treating material in the form of a band with a fluid medium in accordance with claim 1 wherein said folder rollers fold the material onto said first band in a direction transverse to the direction of travel thereof.

3. Apparatus for treating material in the form of a band with a fluid medium in accordance with claim 1 wherein the distance between said first and second bands is always less than the width of each fold of the material whereby the material is held in stack-like position.

4. Apparatus for treating material in the form of a band with a fluid medium in accordance with claim 1 wherein said drive means drives one of said first and second bands thereby ensuring substantially no relative movement between the material and the other of said first and second bands.

5. Apparatus for treating material in the form of a band with a fluid medium in accordance with claim 1 wherein said support means has a friction reducing surface upon which said first band slidably engages for reducing the friction therebetween.

6. Apparatus for treating material in the form of a band with a fluid medium in accordance with claim 1 wherein said guide rollers for guiding said first and second bands through the medium comprise: a first, second and third guide rollers for guiding said first band through said medium wherein said second roller is below and spaced obliquely downward from said first roller and said third roller is above and spaced obliquely upward from said first roller; a fourth and fifth guide roller for guiding said second band through said medium wherein said fourth roller is spaced between and above said first and second rollers and below said third roller and said fifth roller is spaced above said second roller, below said third roller and between said second and fourth rollers; and the diameter of said fifth roller is greater than the diameter of said fourth roller.

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