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WEB-TOWELLING WASHING APPARATUS

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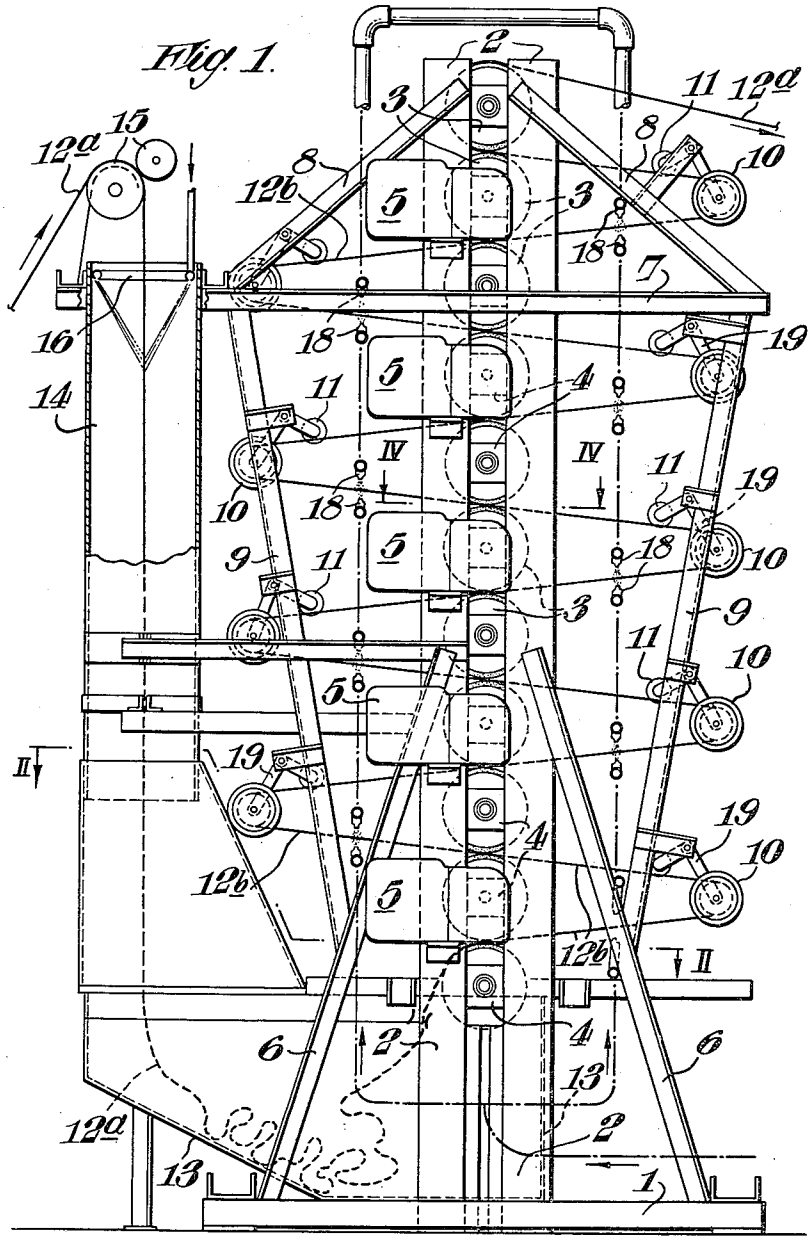
Fig. 1.



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WEB-TOWELLING WASHING APPARATUS

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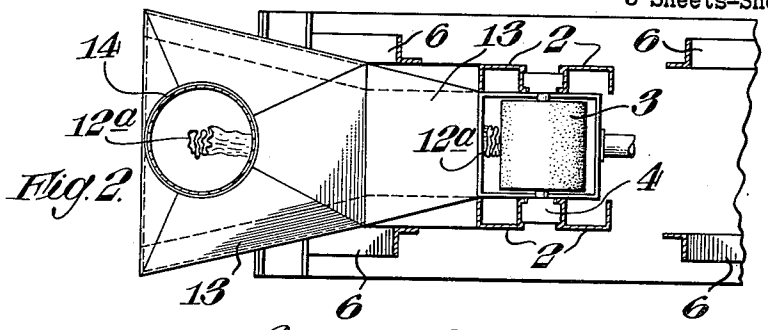

Fig. 2.

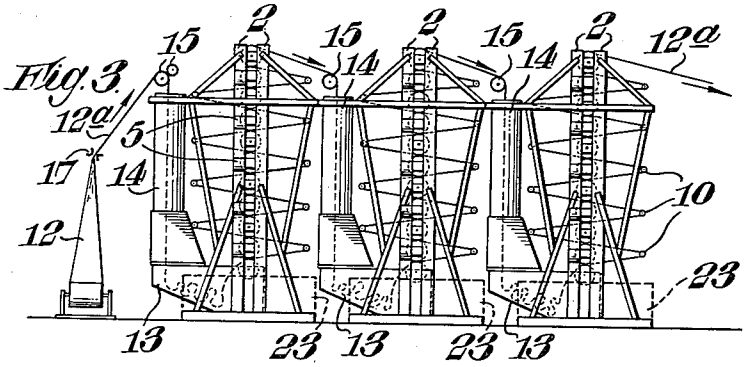

Fig. 3.

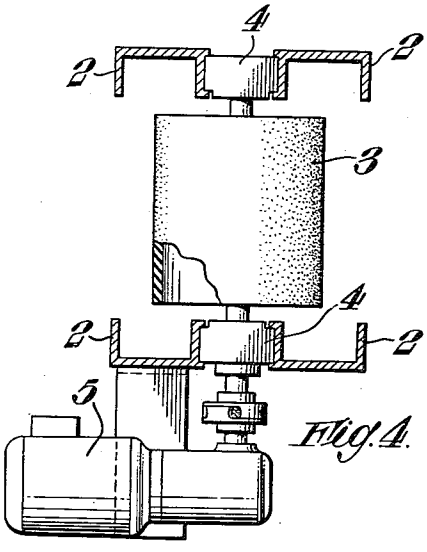

Fig. 4.

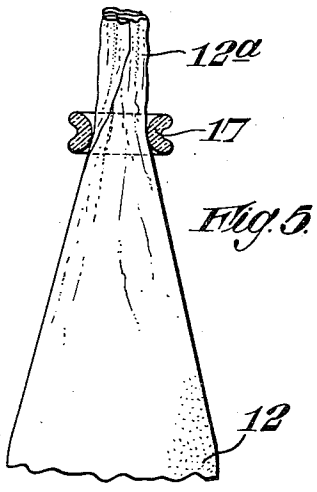

Fig. 5.

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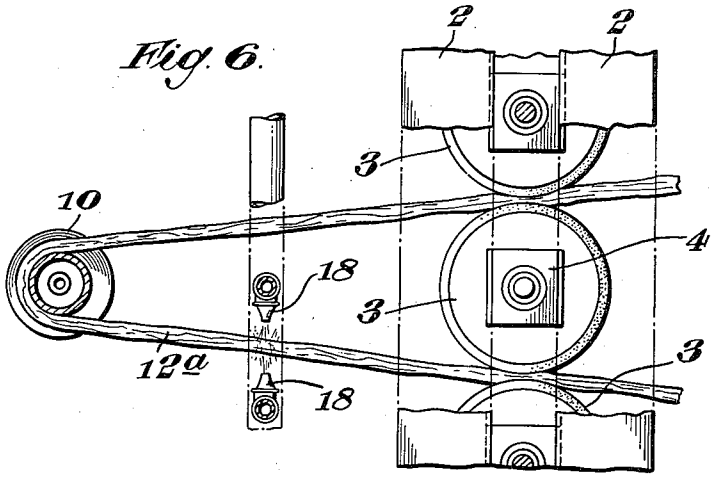
Fig. 6.



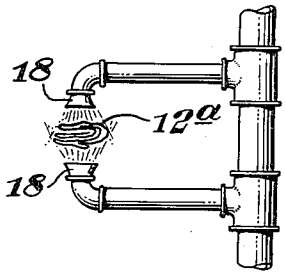
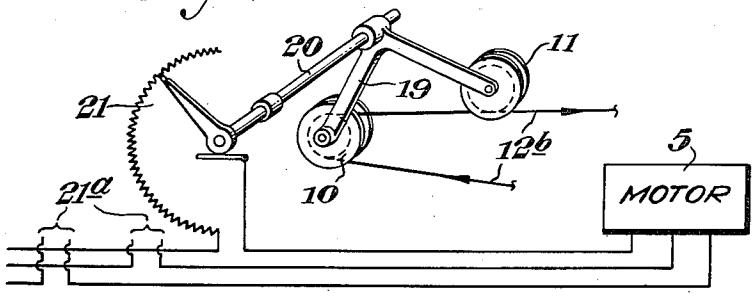


Fig. 7.

Fig. 8.



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3,064,458

WEB-TOWELLING WASHING APPARATUS

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Filed Aug. 14, 1959, Ser. No. 833,797
Claims priority, application Great Britain Aug. 27, 1958
2 Claims. (Cl. 68—22)

This invention relates to apparatus for washing web towelling or other strip material.

Apparatus is well known for dispensing towelling step by step from a continuous rolled web. As the web is unrolled for use, the soiled portion is rewound on to a take-up roll. The invention is particularly, although not essentially, concerned with the washing of such soiled rolled webs of towelling.

Apparatus for continuously washing web towelling, particularly in roped form according to the invention comprises means forming a soaking chamber, means to guide the web into said chamber, a frame, a plurality of vertically alined squeezing rolls mounted in said frame, electric motors for driving alternate squeezing rolls, a plurality of jockey rolls disposed on each side of the vertically alined squeezing rolls, those on one side being staggered in relation to those on the other, said squeezing rolls being alined with jockey rolls alternately on opposite sides of the frame, the arrangement of jockey and squeezing rolls forming open runs of the web towelling on each side of the squeezing rolls, the said jockey rolls being carried respectively on pivotal mountings which are loaded by a counterweight so that the jockey rolls are displaced outwardly away from the squeezing rolls to maintain a required tension in the web, resoaking means disposed on each side of the squeezing rolls to apply cleansing fluid to the open runs of the web loops between the jockey rolls and the squeezing rolls, the displacement of the jockey rolls controlling the speed of the electric motors, whereby, varying local tensions in the web cause the appropriate jockey rolls to be displaced and effect a change of speed in the related motor to compensate for the change of tension and thus tend to maintain an overall uniform tension throughout the web.

In use a plurality of apparatuses as just described may be arranged end to end with the roll axes of all apparatuses parallel to one another whereby a web issuing from one apparatus is led for continuing treatment in a juxtaposed apparatus, and in this case means can be employed for pumping the liquid used in each apparatus of the plurality (excepting the first) into the re-soaking means of the preceding apparatus.

In order that the said invention may be readily understood, two embodiments thereof will be described in greater detail with the aid of the accompanying drawings wherein:

FIGURE 1 is a side elevation of an apparatus (which may constitute one unit of a plurality) according to one embodiment;

FIGURE 2 is a plan of the sluicing and soaking arrangements, being a section on the line II—II of FIGURE 1;

FIGURE 3 is a diagram to a reduced scale showing the arrangement of a plurality of apparatuses according to FIGURE 1;

FIGURE 4 is a section on the line IV—IV of FIGURE 1 illustrating the mounting of the squeezing rolls;

FIGURE 5 is a view showing a guide eye in which the web is converted from its normal flat form into a transversely bundled "rope";

FIGURE 6 is a detail showing nozzles for the application of re-soaking liquid to the open run of web from the nip between a pair of squeezing rolls around a jockey roll;

FIGURE 7 is a view of the nozzles as seen at right-angles to FIGURE 6;

FIGURES 4, 5, 6 and 7 are drawn to an enlarged scale in relation to FIGURE 1;

FIGURE 8 is a perspective sketch of a motor control hereinafter referred to.

In both embodiments depicted in (1) FIGS. 1, 2 and 4 to 8 and (2) FIG. 3, respectively, on a suitable base **1** there is erected a framework including four vertical channel irons **2** arranged in pairs with the channels of one pair facing those of the other pair and serving to support an assembly of vertically aligned squeezing rolls **3** resting one on the other. These rolls may be covered with a rubber or other resilient lining and, as will be seen in FIGURE 4, they are carried by fixed spindles mounted in bearing in blocks **4** which fit between the pairs of channels **2**. Alternate rolls **3** are driven by electric motors **5**.

The framework also includes lower strut frames **6**, upper horizontal frames **7**, upper struts **8** and side supports **9**. The members **8** and **9** support a number of jockey rolls **10** having their bearings in respective arms **19** pivotally mounted on the supports with counterbalances **11** so that they normally tend to swing outwards. The jockey rolls **10** on one side of the squeezing rolls **3** are staggered in relation to the jockey rolls on the other side thereby the squeezing rolls **3** are each aligned with a jockey roll alternately on different sides.

At the front of the apparatus where the web **12***a* is introduced for washing (i.e. on the left-hand side of FIGURES 1 and 3) there is fitted a soaking chamber **13** from which is erected a vertical sluicing chamber **14** surmounted by driven draw rollers **15** and containing, at the top, a spray ring **16** which showers washing liquid on to the web descending down the sluicing chamber **14**.

The web **12***a*, weighted by the washing liquid, descends by gravity into the soaking chamber **13** and is thoroughly soaked prior to being led to the nip between the two lower-most squeezing rolls **3**.

Although the web may be treated in a flat condition, it is preferred to bunch it together transversely into irregular longitudinal folds, and for that purpose it is drawn through a ring **17** (FIGURES 3 and 5) so that it issues in the bunched or "rope" form shown at **12***a* in FIGURES 5, 6 and 7. For clearness the bunched web **12***a* is shown as a single line in FIGURES 1 and 3.

The web is led from the nip between the lowermost pair of squeezing rolls **3** around a jockey roll **10** and thence back to the next higher nip making, in so doing, a pair of open runs **12***b*. From this second nip it is passed around a jockey roll **10** on the other side of the stack of squeezing rolls **3**, thence back to the next higher nip and so on up to the topmost nip from which it is delivered around the top roll **3**.

On its passage upwards through the assembly of squeezing rolls **3** the web is subjected to a re-soaking step between each squeeze. For this purpose the web, on issuing from a squeezing step between a pair of rollers **3** passes between a pair of opposed nozzles **18** (see particularly FIGURES 6 and 7) from which more washing liquid is flooded on to the web.

As shown in FIGURE 8, in order to maintain a uniform tension on the web as it runs from bottom to top of the assembly of squeezing rolls **3**, the jockey rolls **10**, if they move outwards according to slackening of tension on the open runs **12***b*, through the shaft **20** on which they are mounted, operate a speed-controlling device e.g., a variable resistance **21** on the next succeeding motor **5** to accelerate the speed of revolution and so take up the slack. Conversely, if the jockey rolls move inwards, with the open run **12***b* tightening, then the next preceding motor **5** is caused to decelerate. One gang of a 3-gang

resistor **21** is shown, and the leads from the second and third resistors are indicated at **21***a*.

In certain cases it may be sufficient to pass the web once through a single apparatus working alone, but it is preferred to use a plurality of apparatuses arranged end to end as shown in FIGURE 3. The arrangement is such that the roll axes of all the apparatuses are parallel with one another and the web treated in the first apparatus (i.e. the one on the left of FIGURE 3) continues its treatment in the next.

I claim:

1. Apparatus for continuously washing web towelling, particularly in roped form, comprising means forming a soaking chamber, means to guide the web into said chamber, a frame, a plurality of vertically alined equeezing rolls mounted in said frame, electric motors for driving alternate squeezing rolls, a plurality of jockey rolls disposed on each side of the vertically alined squeezing rolls, those on one side being staggered in relation to those on other, said squeezing rolls being alined with jockey rolls alternately on opposite sides of the frame, the arrangement of jockey and squeezing rolls forming open runs of the web towelling on each side of the squeezing rolls, the said jockey rolls being carried respectively in pivotal mountings which are loaded by a counterweight so that the jockey rolls are displaced outwardly away from the squeezing rolls to maintain a required tension in the web, resoaking means disposed on each side of the squeezing rolls to apply cleansing fluid to the open runs of the web loops between the jockey rolls and the squeezing rolls, means responsive to the displacement of the jockey rolls for controlling the speed of the electric motors, whereby, varying local tensions in the web causes the appropriate jockey rolls to be displaced and effect a change of speed in the related motor to compensate for the change of tension and thus tend to maintain an overall uniform tension throughout the web.

2. Apparatus according to claim 1, wherein the soaking chamber for the web has its inlet constituted by a vertical sluicing chamber disposed alongside a series of jockey rolls on one side of the vertical line of the squeezing rolls and the means to guide the web into said soaking chamber comprises a pair of draw rollers from which the web hangs vertically down the sluicing chamber and through an array of spray devices so that it is soaked with cleansing fluid before it reaches the soaking chamber.

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