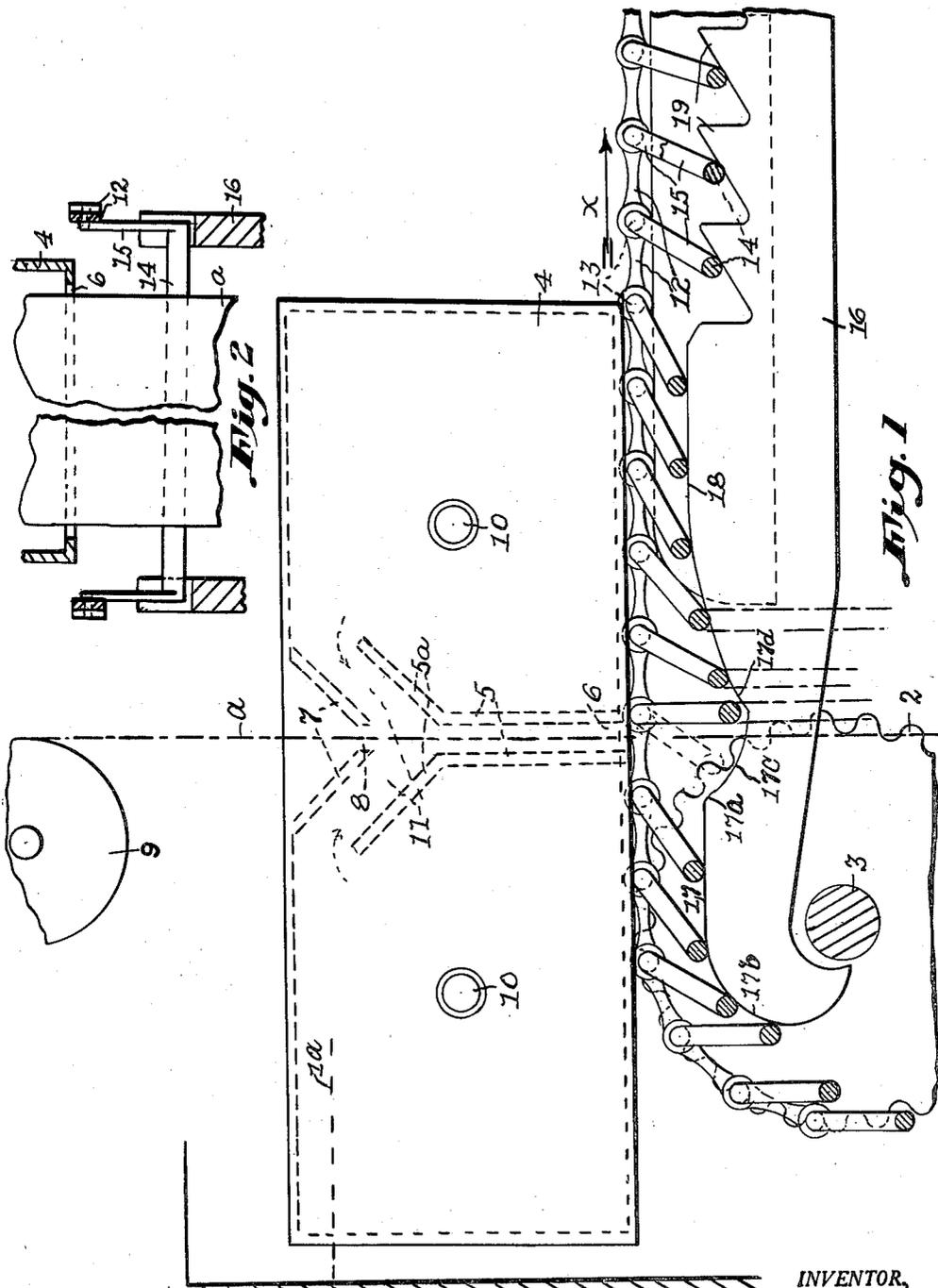


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WEB FESTOONING DEVICE

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# UNITED STATES PATENT OFFICE

2,544,159

## WEB FESTOONING DEVICE

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It is known to deliver a fabric downwardly in pendent state and during such delivery to advance an elongated conveyor or carrier, having transverse spaced staves, through the delivery plane so that the falling fabric gathers in loops on the staves. Such is shown, for instance, by my Patent No. 2,268,590 in which the fabric undergoes a liquid treatment. The looping is an incident of the fall of the fabric being faster than the advance of the carrier. The fabric should engage each stave without resting thereon in localized lapped or creased state, especially if it is delicate and is undergoing or has undergone liquid treatment, and manifestly it should engage only one stave in the forming of a loop, or not bridge two or more.

To attain these ends the apparatus according to this invention is, generally stated, constructed as follows: The carrier moves lengthwise of itself in a path through the plane of the downwardly delivered fabric in pendent state. To it are pivoted at substantially equal spacings lengthwise thereof what I term pendulum pendants in that such pendants are free to swing pendulum-fashion on substantially parallel axes traversing the carrier, they being all substantial counterparts of each other; the pendants respectively have, removed from and below and substantially parallel with and equidistant from said axes, staves to impinge against the fabric. Finally, there is structure having means to support the carrier while moving in said path and means at the approach side of the fabric plane successively to maintain the pendants displaced rearwardly from their pendant state and then successively free them sufficiently close to said plane to permit each pendant, when so freed, to swing forwardly through said plane in resuming its pendent or normal state. When each pendant is freed thus to swing its stave impinges against the fabric and thereby induces it to lap over the stave without undergoing localized lapping or creasing thereon. Further, in the canted state of any pendant the distance between its stave and the stave of the pendant next ahead and last freed is greater than it would be with both such pendants in normal or pendent state, wherefore the possibility of the fabric in falling bridging two or more staves is appreciably reduced and it is obviously possible to construct the assembly including the carrier and pendants so as to increase its capacity.

I hereinafter explain my invention by reference, for example, to an apparatus generally like that set forth in my said patent, modified for the

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purpose in hand. The carrier in such case includes two endless chains which are operatively supported by four pairs of sprocket wheels, and the expedients for receiving and supporting the fabric in depending loop state, being the mentioned pendants, connect the two chains; but in the broad aspect of my invention, as will be apparent, such details are immaterial.

In the drawing,

Fig. 1 shows so much of an apparatus for treating a fabric with liquid as is material for the purpose in hand, the parts shown appearing in longitudinal vertical section except for the means which delivers the fabric and a liquid stream;

Fig. 2 is a transverse section of what is shown in Fig. 1 in a vertical plane immediately to the left of the plane of descent of the fabric.

1 is a liquid-containing vat; 2 one of a pair of four pairs of sprocket-wheels of which each pair is mounted on a shaft 3 assumed to be journaled in suitable bearings (not shown) in fixed structure including the vat and around which sprocket-wheels a pair of endless chains extend to form together in the present instance the mentioned carrier or conveyor; and 4 a liquid delivery or cascade device which, as in my said patent, is a shell divided into two sections by spaced upright walls 5 providing a bottom slot-like outlet 6 and flared at their upper end portions 5a, 7 being upper flared walls spaced from the flared portions of the walls 5 so that the liquid in the two sections may flow therefrom to the outlet and having their inner margins spaced to form a slot-like inlet 8 above outlet 6. The fabric is delivered downwardly, as by a suitably rotated roll 9, so as to pass through the inlet and outlet and, treating liquid being continually pumped into the two sections of the cascade device, as at 10, flows via the passages at 11 against opposite sides of the pendant fabric to fall with it via the outlet and into the path of the pendants pivoted to and depending from the carrier. The upper stretch shown of the carrier and more or less of the cascade device are preferably below the level 1a of the liquid in the vat which, as fast as it is supplied thereto by the cascade device, is withdrawn therefrom and returned to said device as in my said patent.

Each of the mentioned chains of the carrier comprises links 12 pivoted together at equally spaced intervals, as at 13. The carrier moves in the direction of arrow x and so through the vertical plane a of the portion of the fabric which depends from roll 9. The mentioned pendulum

pendants are here generally U-shaped and each comprises a stick or stave 14 (preferably cylindrical) having at its ends arms 15 lying in the same radial plane (as indicated at the right in Fig. 1, where the rear arm of one pendant is shown broken away) and respectively freely pivoted at their free ends in coaxial relation to the pivots 13, alined with each other. As shown in Fig. 2 outlet 6 is so disposed that the fabric *a* falls in the path of the staves of the pendants.

The mentioned fixed structure includes at least one rail 16 extending below and generally parallel with the upper stretch of the (here) endless carrier, underlying the pendants; it is assumed here to be fixed to the adjacent side of the vat in any way, not shown. This rail affords the mentioned means at the approach (or here left) side of the fabric plane *a* successively to maintain the pendants rearwardly canted and then successively free them sufficiently close to said plane to permit each pendant, when so freed, to swing forwardly through said plane in resuming its normal or pendent state. This means here takes the form of an elevation 17 of the rail, terminating at 17*a* suitably short, for the purpose in view, of said plane. In this example, in which the carrier is endless, the top surface of said elevation merges at its rear end into a convex surface 17*b* of the rail so that the pendants are caused gradually to assume their canted state. When any pendant is allowed by means 17 to fall on having passed terminus 17*a* its stave impinges against the descending fabric and so induces it to lap rearwardly over such stave, without undergoing piling thereon, with creasing. The canted relation of the pendant next aft of the one which last assumed the pendent state involves a spacing between their two staves greater than that between the staves of any two adjacent pendants in pendent state.

It is to be noted that the fall of any pendant in such manner as to be checked by the one next ahead may cause injury to the fabric due to its undergoing compacting by the staves of such pendants. Hence the depression in the rail at 17*d* (which determines the terminus at 17*c*) is formed with a convex abutment 17*c*. In the forward swing of any pendant the same is checked by such abutment short of the next forward pendant and when the former pendant has already impinged against the fabric.

As shown, said abutment may continue to rise to form another elevation 18 which is then followed by a series of saw-tooth elevations 19 that cause repeated rise and fall of the pendants in a known way thereby to change the lines of contact of the (liquid-immersed) staves with the fabric. By the increased spacing between a canted stave about to fall and the one next

ahead there is not only less likelihood of the fabric bridging two staves during its descent but each loop may be developed to greater depth than would otherwise be possible.

Having thus fully described my invention, what I claim is:

1. In combination with means to deliver fabric over a downward course and in a pendant state, a carrier provided with substantially U-shaped freely pivoted cross members movable lengthwise with the carrier and over a path intersecting said course, a rail disposed subjacent said carrier and provided with spaced member-actuating sections arranged in said path prejacant and postjacant said course, respectively, for engaging and maintaining said members in trailing relation with respect to their pivots during movement of said carrier relative to said sections and with said members assuming verticality between said sections to engage said fabric and effect looping of the latter over said members for movement with the carrier.

2. In combination with means to deliver fabric over a downward course and in a pendant state, a carrier provided with substantially U-shaped freely pivoted cross members movable lengthwise with the carrier and over a path intersecting said course, a rail disposed subjacent said carrier and provided with spaced member-actuating sections arranged in said path prejacant and postjacant said course, respectively, for engaging and maintaining said members in trailing relation with respect to their pivots during movement of said carrier relative to said sections and with said members assuming verticality between said sections to engage said fabric and effect looping of the latter over said members for movement with the carrier, said rail being provided with spaced abutments disposed in said path postjacant said sections and effective for raising and lowering said members to cause shifting of said fabric relative to said members during said movement.

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