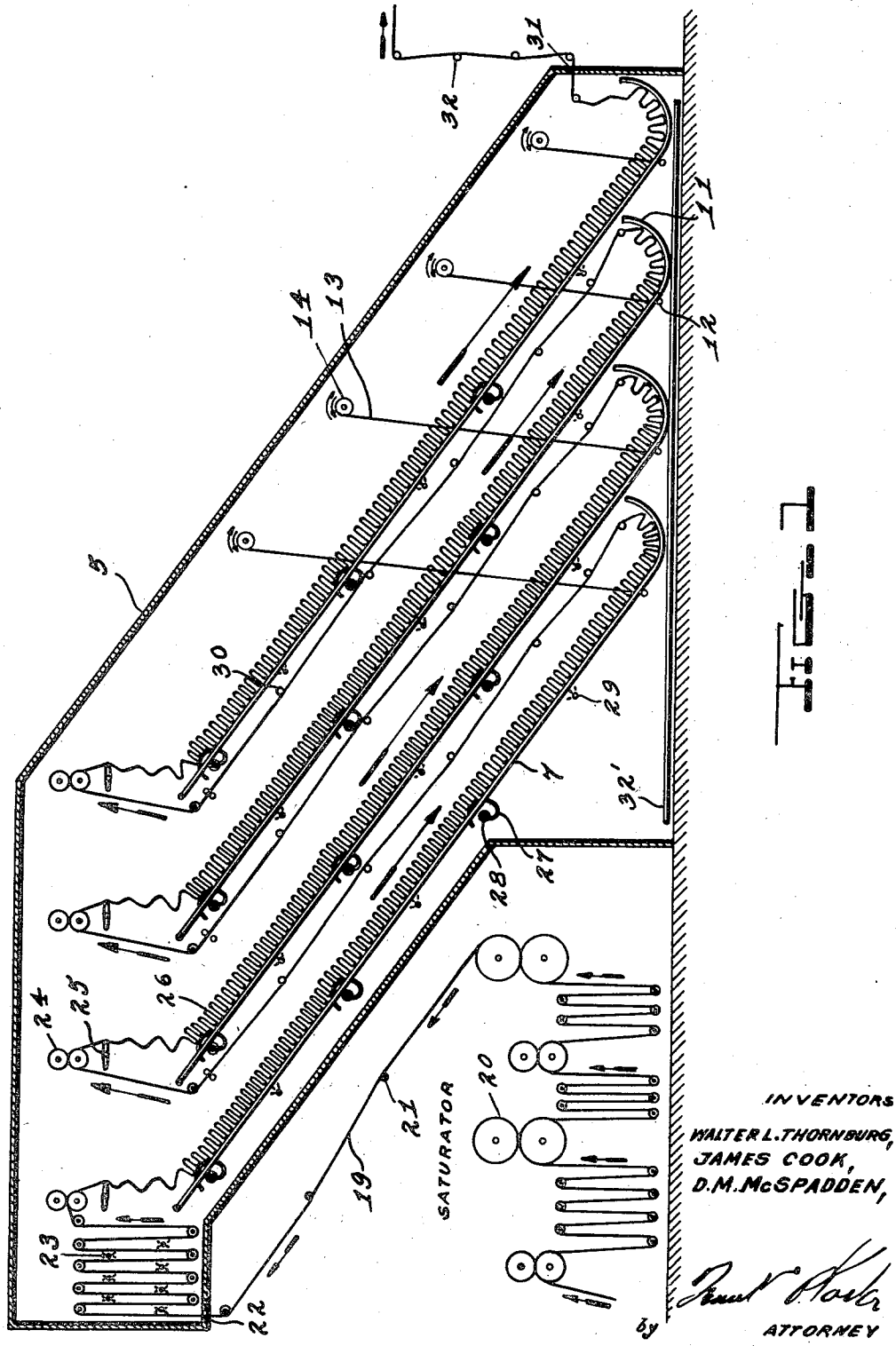
Nov. 25, 1947. J. COOK ET AL 2,431,372

APPARATUS FOR CONTROLLING THE MOVEMENT OF FABRIC THROUGH PROCESSING CHAMBERS

Filed Nov. 19, 1945 3 Sheets-Sheet 1



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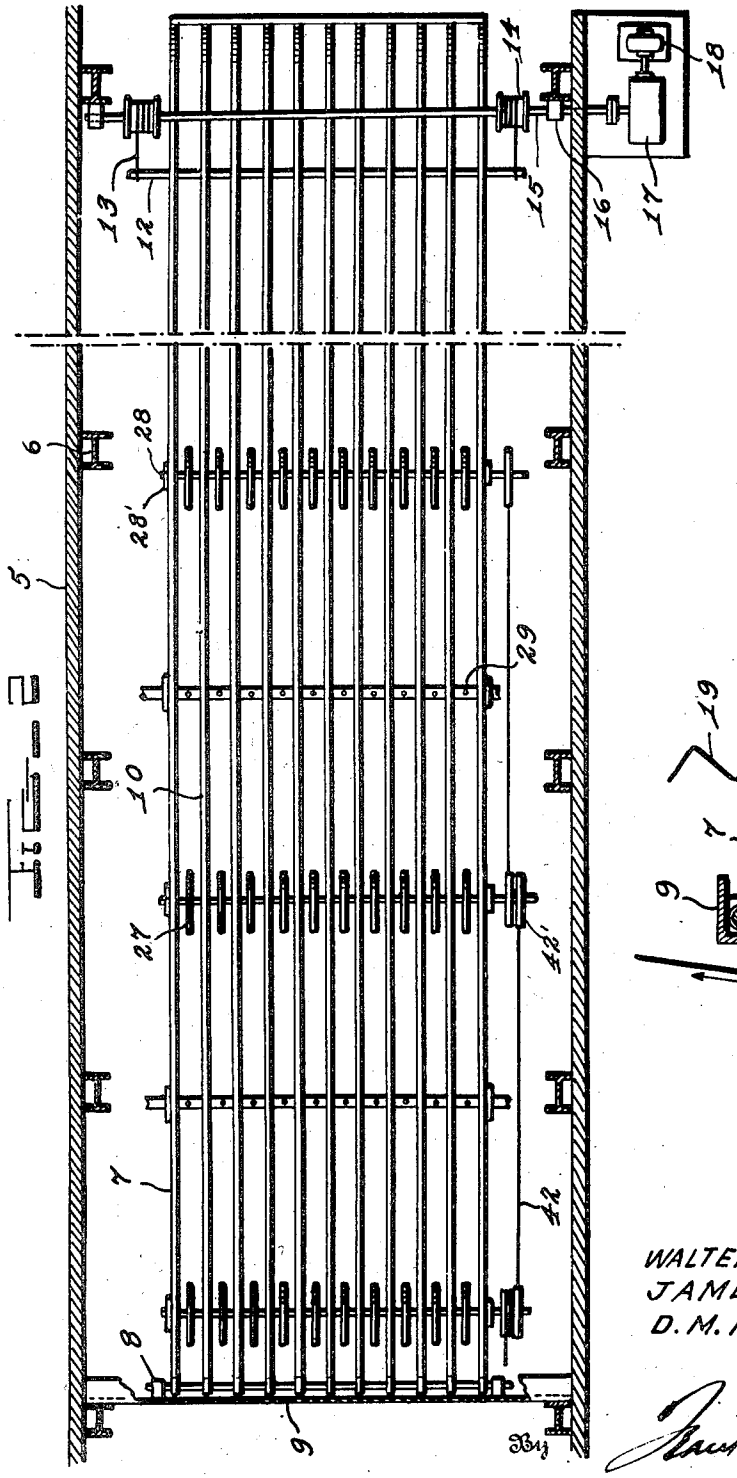


FIG. 2

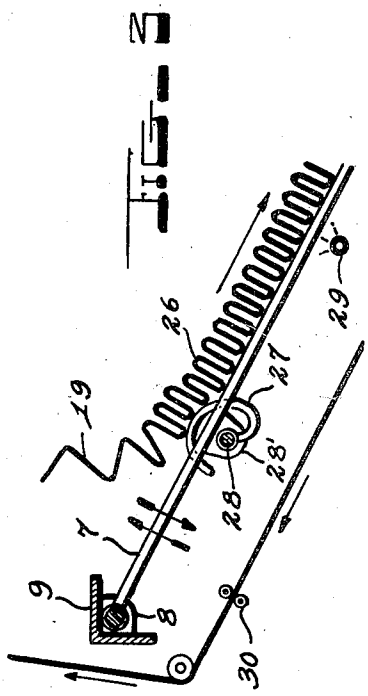


FIG. 3

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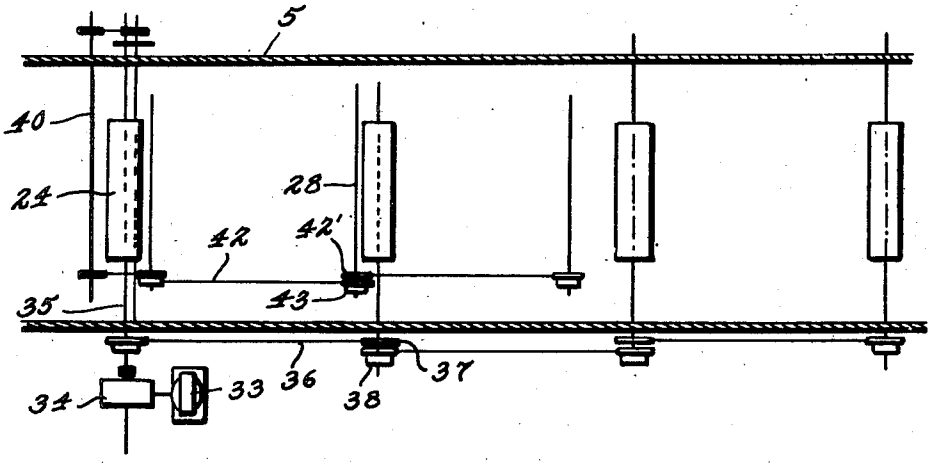
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FIG. 4



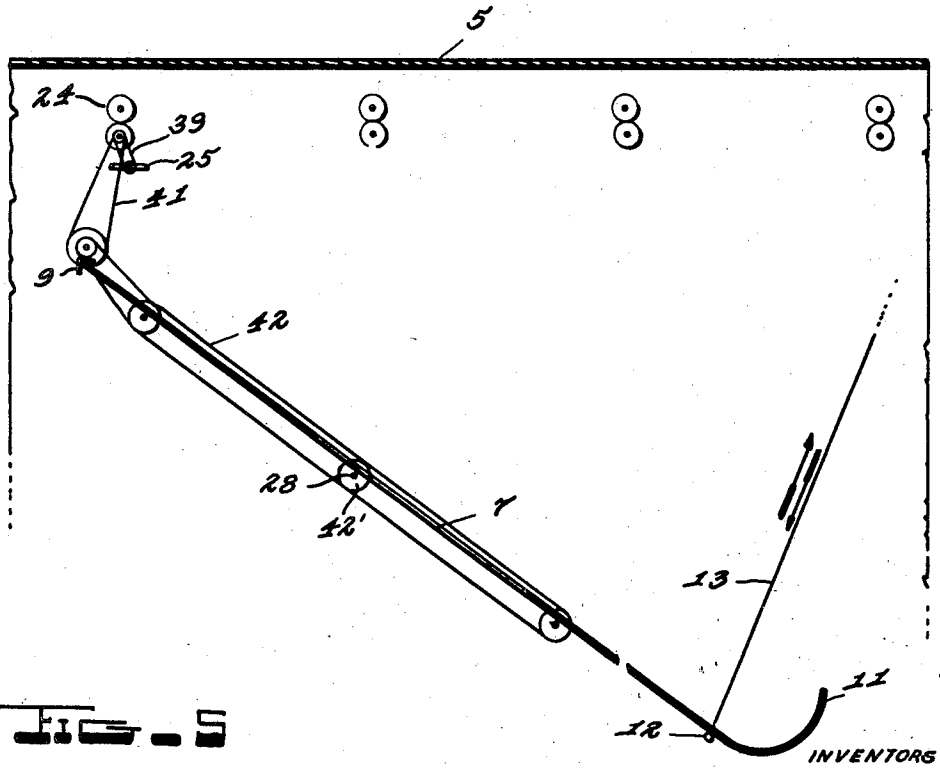


FIG. 5

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APPARATUS FOR CONTROLLING THE MOVEMENT OF FABRIC THROUGH PROCESSING CHAMBERS

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Application November 19, 1945, Serial No. 629,384

12 Claims. (Cl. 68—205)

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This invention relates to a timing unit for continuous processing of textile fabrics and has particular reference to the bleaching, desizing or similar treatments of fabrics in full open width.

It is an object of the invention to provide a treating chamber having a series of inclined open slides for freely supporting and guiding the open width fabric in its travel through the chamber.

A further object of the invention resides in adjustably mounting the fabric supporting slides to permit the degree of inclination to be changed and thereby control the speed at which the fabric travels down the slides.

A still further object of the invention resides in providing means associated with the slides for mechanically aiding the downward movement of the fabric to insure a uniform movement of the fabric through the chamber.

Another object of the invention resides in constructing the slides of spaced longitudinal rods or bars which serve as tracks to guide the fabric down the slides in a straight line, the open structure of the slides permitting a more uniform and thorough treating of the fabric without crushing or marking the same.

Other objects and advantages of the invention will be apparent during the course of the following description.

In the accompanying drawings forming a part of this specification and in which like numerals are employed to designate the same,

Fig. 1 is a vertical sectional view of the treating chamber showing a series of slides arranged therein,

Fig. 2 is a top plan view of one of the slides,

Fig. 3 is a detail sectional view showing the hinge mounting for the slides,

Fig. 4 is a schematic plan view of the driving mechanism, and,

Fig. 5 is a schematic side elevational view of the driving mechanism.

In the drawings wherein for the purpose of illustration a preferred embodiment of the invention is shown the numeral 5 denotes a housing or chamber constructed of suitable insulation material and is provided with observation windows and doors so the operator may view the action of the fabric and have access to the interior of the chamber. The side walls of the chamber are reinforced by spaced vertical I beams 6 which

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serve as supports for the equipment disposed within the chamber. A plurality of spaced inclined slides 7 are disposed within the chamber and each of the slides are hingedly mounted at their upper ends in bearing lugs 8 carried by transverse angle bars 9 attached to the beams 6. In the present illustration four slides are shown but two or more of the slides may be employed depending on the fabric to be treated. The slides consist of a series of spaced parallel bars or rods 10 extending longitudinally with their lower ends curved upwardly, as at 11. A lifting bar 12 extends across the bottom of the slide, adjacent its lower end, which is suspended at each end by flexible cables 13 from winding drums 14 mounted on a drive shaft 15 journaled in bearings 16. The shaft 15 is connected by suitable reduction gearing 17 to a reversible motor 18 which drives the shaft to raise or lower the slide to change the degree of inclination.

The fabric 19 as it leaves the previous processing machine generally indicated at 20, passes over guide rollers 21 and is delivered in open width to the timing unit. The fabric enters the chamber 5 through a slot 22 and after passing through the conditioning skyer where it is treated by sprays 23 it passes between the first pair of draw rolls 24 arranged above the upper end of the first slide which deliver the fabric onto the slide. A rotating plaiter 25 is arranged beneath the draw rolls 24 and as the fabric is delivered to the slide it passes the plaiter which causes the fabric to fall on the slide in a plaited or rippled condition, as indicated at 26. To assist the gravitational movement of the fabric down the slide a series of agitators or kickers are arranged intermediate the bars 10 of the slide. The kickers consist of curved fingers 27 attached at one end to rotating shafts 28 journaled in bearings 28' depending from opposite sides of the slide and upon rotation of the shafts the fingers are brought into contact with the underside of the fabric so as to impel the fabric downward. Arranged intermediate the shafts 28 and transversely of the slide are a series of spray pipes 29 for treating the fabric with steam, hot water or chemicals. Upon reaching the bottom of the slide the curved ends 11 of the bars 10 reverse the direction of movement of the fabric which travels in an upward reverse direction over and under guide rods or rolls 30 which

straighten and smooth the fabric before it passes through the second pair of draw rolls preparatory to delivering the fabric to the second slide where the fabric is subjected to the same action as on the first slide. The same action is repeated on each succeeding slide and from the last slide the fabric is drawn from the chamber 5 through a slot 31 and travels over guide rods 32 to the next processing machine. A steam heating pipe 32' is arranged in the chamber 5 for maintaining the desired temperature in the chamber.

In Figs. 4 and 5 a schematic plan of driving mechanism for the draw rolls, plaiter and kicker shafts is shown. A drive motor 33 is connected through conventional reduction gearing 34 to the driving shaft 35 of the first pair of draw rolls 24. The succeeding pairs of draw rolls have their drive shafts connected by drive chains or belts 36 and pulleys 37 with drive shaft 35 and clutches 38 are provided to individually control the operation of each pair of draw rolls. The plaiter 25 is driven by a chain drive 39 from shaft 35 and jackshaft 40 is connected with shaft 35 by chain drive 41. The jackshaft 40 through the chain drive 42 and pulleys 42' is connected with the kicker shafts 28 which are independently controlled by clutches 43.

In operation the fabric to be treated is delivered to the chamber 5 in full open width and after passing through the first set of draw rolls 24 is deposited on the upper end of the first open slide 7 in plaited or rippled condition. As the slide is inclined downwardly the weight of the fabric will cause it to gravitate downwardly. The rotating kickers 27 arranged beneath the slide assist in the downward movement of the fabric and assure a uniform flow of the fabric. When the fabric reaches the lower end of the first slide its movement of direction is reversed and it passes to the second set of draw rolls which deposit the fabric on the second slide where it is subjected to the same action as on the first slide. As the fabric moves from the lower end of the first slide to the second set of draw rolls it is stretched out flat and smoothed before it enters the draw rolls, so that it is not folded in the same places when deposited on the second slide. This eliminates the danger of marks forming on the fabric which would result if the folds in the fabric remained the same for too long a time. The open slides permit cloth of different widths to be processed and the spaced bars forming the slides serve as tracks which guide the movement of the fabric in a straight line. The open construction of the slides insures a uniform treatment of both sides of the fabric as the atmosphere in the chamber is permitted to contact all fibres of the fabric for an equal length of time. To accommodate various weights of fabric and control the speed of the movement of the fabric down the slides, the inclination of the slides may be changed by raising or lowering the slides which are hinged at their upper ends. The timing unit insures a continuous movement of the fabric at a uniform speed which is wholly automatic in its operation requiring little or no attention.

It is to be understood that the form of invention herein shown and described is to be taken as a preferred example of the same and that certain changes in the shape, size and arrangement of the parts may be made without departing from the spirit of the invention or scope of the subjoined claims.

Having thus described our invention, we claim:

1. A timing unit for processing textile fabric comprising a chamber, a series of inclined chutes disposed within said chamber, each of said chutes being composed of rigid longitudinal rods disposed in a common plane in spaced apart relation, and means for feeding the textile fabric onto the upper end of the chutes in full open width.

2. Apparatus of the character described in claim 1 including means for delivering the fabric in plaited condition to the chutes.

3. Apparatus of the character described in claim 1 having the chutes arranged to successively receive the fabric and means between each of the chutes for straightening and smoothing the fabric as it moves from one chute to the next.

4. Apparatus of the character described in claim 1 including movable kickers arranged beneath the chutes for intermittently lifting the fabric to impel its movement down the chutes.

5. Apparatus of the character described in claim 1 including spray pipes arranged transversely of the chutes for spraying the fabric as it moves down the chutes.

6. Apparatus of the character described in claim 1 wherein the inclined chutes are hingedly mounted at their upper ends to permit the inclination of the chutes to be adjusted.

7. A timing unit for processing textile fabric comprising a chamber, inclined chutes arranged within said chamber to successively receive the fabric, each chute being composed of rigid longitudinal rods disposed in a common plane in spaced apart relation, a plaiting device for laying the fabric in a rippled condition on the upper end of said chutes, and guide rods between the chutes for passing the fabric over to spread and smooth the fabric before it is delivered to the next chute.

8. A timing unit for processing textile fabric comprising a chamber, inclined chutes disposed within said chamber down which the fabric is adapted to slide, said chutes being composed of spaced longitudinal rods, rotating kicker shafts extending across the underside of said chutes, and fingers carried by said kicker shafts adapted to rotate in the spaces between the rods of said chutes to impel the downward movement of the fabric.

9. A timing unit for processing textile fabric comprising a chamber, inclined chutes disposed within said chamber down which the fabric is adapted to slide, the bottom of said chutes having longitudinal slots movable kickers disposed beneath said chutes and operable through the slots in the bottom thereof to intermittently raise the fabric and impel its movement down the chutes.

10. A timing unit for processing textile fabric comprising a chamber, inclined chutes disposed within said chamber down which the fabric is adapted to slide, said chutes being composed of spaced longitudinal rods, rotatable kickers operable in the spaces between said rods for intermittently raising the fabric to impel its movement down the chutes.

11. A timing unit for processing textile fabric comprising a chamber, inclined chutes disposed within said chamber down which the fabric is adapted to slide, said chutes being composed of rigid longitudinal rods disposed in a common plane extending transversely of said chamber and in spaced apart relation, means for feeding the fabric onto the upper end of the chutes in full open width, and means for impelling the movement of the fabric down the chutes.

12. A timing unit for processing textile fabric comprising a chamber, a series of inclined chutes arranged within said chamber to successively

receive the fabric, each chute being composed of straight rigid longitudinal bars disposed in a common plane transversely of the chamber and in spaced apart relation, and means for feeding the textile fabric onto the upper end of the chutes in full open width whereby the fabric is fully exposed to the atmosphere in the chamber.

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