Dec. 18, 1934. A. WAGNER 1,984,853

SPINNING MACHINE FOR SPINNING ARTIFICIAL SILK

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Fig. 1

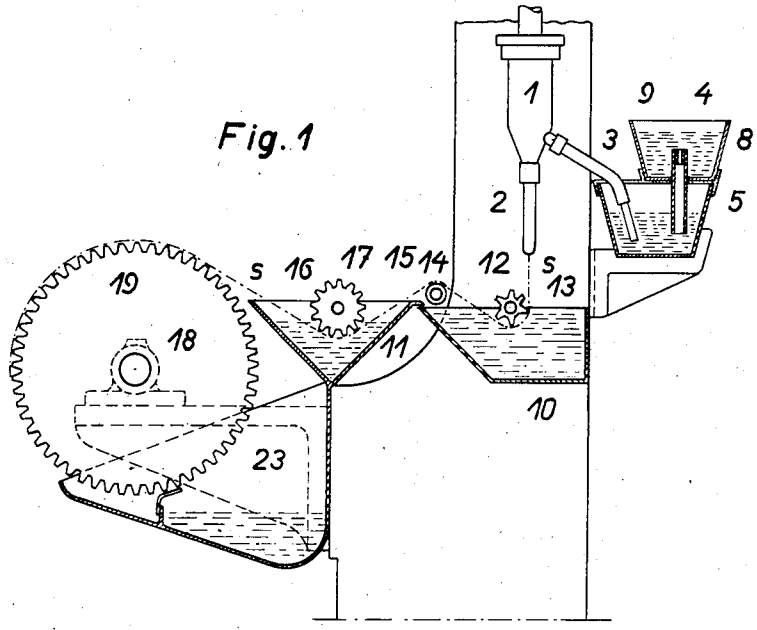
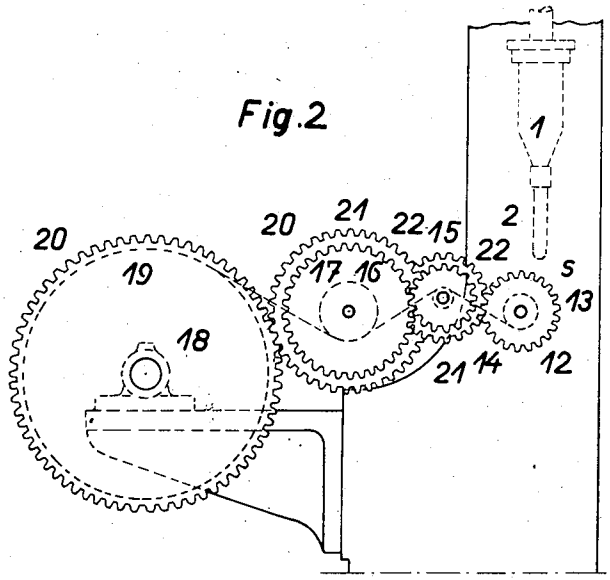


Fig. 2



A. Wagner INVENTOR

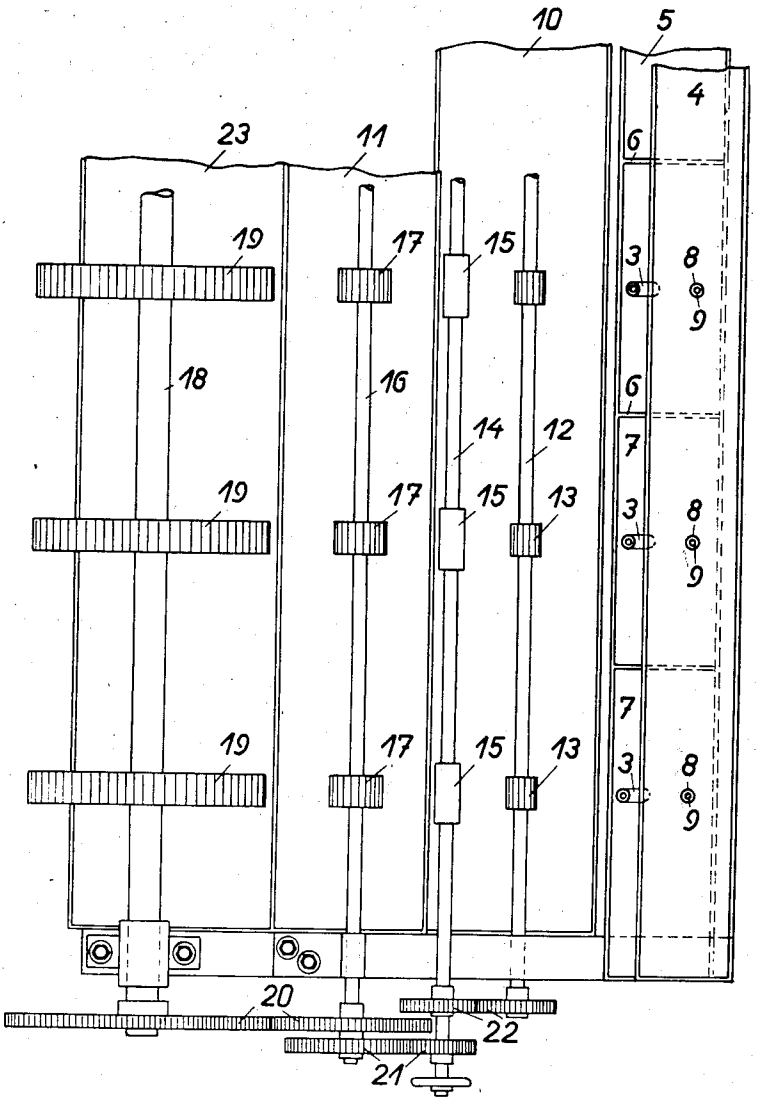
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Fig. 3



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UNITED STATES PATENT OFFICE

1,984,853

SPINNING MACHINE FOR SPINNING ARTIFICIAL SILK

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In Germany May 4, 1926

3 Claims. (Cl. 18—8)

As compared with the known devices in machines for spinning artificial silk by the stretch-spinning method, in which the filament passing successively through several baths is stretched progressively, the present invention is characterized in the first place in this, that the filament runs between the spinning funnel and the drawing off pulley almost entirely (i. e. over the greatest part of its path) through liquid or different liquids instead of through air, and that it is guided in its passage by rotating members only which are rotated at a peripheral speed corresponding to the desired speed of travel of the filament at the place in question. The filament is thus passed through a liquid or different liquids along a much longer path than has hitherto been the case, but, owing to its being guided on rotating guiding members only (instead of on stationary glass rods or the like), it is gently treated, while being stretched in a suitably regulable manner.

A further improvement consists in this, that the siphons for feeding the spinning funnel wth precipitant (usually water) take this liquid not directly from a trough common to all the funnels, but from separate intermediate containers, each belonging to a funnel, which containers are kept filled from the common trough, each by a small tube communicating with the container. Should, by the precipitation of copper salt or by the formation of flakes from the spinning can, the neck of a spinning funnel happen to become constricted the action and the velocity of outflow of the jet of water containing the newly formed filament will of course be diminished, which has a detrimental effect on the product. The arrangement according to the present invention automatically equalizes such an accidental constriction and any inequality in the cross-sectional area of the funnel necks within very wide limits, without the occurrences at the various funnels reacting on the other funnels. When the supply to the container is suitably adjusted with respect to the siphon action, any diminution in the velocity of outflow at the funnel neck causes the level of the liquid in the intermediate container to rise, thus producing an increased head which increases the siphon action and thereby equalizes the reduction in the velocity of outflow.

In the accompanying drawings a constructional example of the invention is shown,

Figure 1 being a vertical cross-section,

Figure 2 an end elevation, and

Figure 3 a plan view showing part of the apparatus.

1 is one of the known type of spinning funnel which is kept filled with water and in the upper end of which is the finely perforated spinning rose or spinning nozzle (not shown), from which the copper oxide ammonia solution flows into the water, forming delicate sticky fibres. The bunch of fibres *s* emerges from the neck 2 of the funnel together with the jet of liquid surrounding it.

For continuously feeding the funnel with fresh water the siphon tube 3 is provided. According to the invention the said siphon tube is not directly immersed into a trough common to all the spinning funnels, but into a trough 5 located below common trough 4, which trough 5 is divided by partitions 6 into separate basins 7, each basin belonging to a funnel. The basins 7 are fed from the trough through the tubes 8. In order that the feeding of the basins 7 may be regulated with respect to the outflow from the necks 2 of the funnels, it is preferable to make the tubes 8 wider than is otherwise necessary and to insert perforated rubber stoppers or equivalent means indicated at 9 in their orifices. As clean water flows through the tubes 8, their internal diameter is not liable to become constricted, as is occasionally the case with the necks 2 of the funnels. If in one of the funnels the siphon action should become reduced, the level of the liquid in the corresponding basin 7 will rise and in consequence as regards the further siphon action the reduction in cross-sectional area be compensated by the increase in the head.

The trough 10 receives the water containing copper salt and allows the excess above a certain level to flow away. A second trough 11 may contain for instance an iron sulphate solution, in which a definite level is maintained in a known manner by a continuous supply of solution and the outflow of the excess. Through these two troughs the bunch of fibers *s* is led, before being seized by the drawing or stretching disc 19.

According to the invention for guiding the fresh bunch of fibres on its way between funnel and drawing disc and for systematically stretching the same there are the three drawing and guiding members, which are placed in front of the known drawing disc 19. The first of these members consists of the shaft 12 rotating in the trough 10 and provided with the discs 13 notched in the manner of a toothed wheel for preventing the

adhesion of the sticky bunch of fibres, the second member consists of the shaft 14 having rubber sleeves 15 for guiding the bunch of fibres from the trough 10 to the trough 11 and the third member consists of the shaft 16 with the notched discs 17, rotating in the trough 11. In front of and below the trough 11 is journalled the shaft 18 with the known notched large drawing discs 19.

Let the peripheral speeds of the members 13, 15, 17, 19 be in the ratio of 5:8:12:32. It follows, that the bunch of fibres will in the first instance be stretched only slightly, the stretching being moderately increased from member to member and only being considerable between the members 17 and 19, corresponding to the circumstance, that the filament is at first not very compact and is unable to withstand much tension, and is preferably only stretched to any considerable extent after having passed through the path 11. The above figures are only given by way of example and depend on other factors, more particularly on the state of the solution in the can and the baths. It will however be clear, that, in accordance with the invention, the stretching of the filament can be regulated in a predetermined and positive manner.

The members 13, 15, 17 may be driven from the shaft 18 by the pair of toothed wheels 20 driving the shaft 16, the shaft 16 driving the shaft 14 through the pair of toothed wheels 21 and in the shaft 14 driving the shaft 12 through the pair of toothed wheels 22.

What I claim is:

1. A spinning machine for the production of artificial silk by the stretch-spinning method, comprising in combination a spinning funnel, a plurality of baths arranged in series, one of said baths being adjacent said spinning funnel, means for guiding the filament from the spinning funnel successively through said baths, said means comprising rotatable stretching members in said baths and means for rotating said stretching members at progressively increasing peripheral speeds so as to stretch the filament with a draft which increases from one stretching member to another, as and for the purpose set forth.

2. A spinning machine for the production of artificial silk by the stretch-spinning method, comprising the combination with a plurality of spinning funnels and a trough for precipitating liquid common to all the funnels, of a siphon feed device for each funnel comprising a basin for each funnel arranged between said common trough and the funnel, a tube extending into said basin and having its upper end passed into said trough so as to be immersed in the liquid in the trough for feeding precipitating liquid from the trough to the basin and a pipe connected to the funnel and extending into the basin so as to dip into the liquid therein, said pipe forming one arm of a siphon of which the funnel constitutes the other arm, whereby on the funnel outflow becoming constricted, the liquid level in the basin will rise, thereby raising the pressure head acting on the siphon as and for the purposes set forth.

3. A spinning machine for the production of artificial silk by the stretch-spinning method, as claimed in claim 2, and having the tubes for conveying the precipitating liquid from the common trough to the intermediate basins of a larger diameter than required for the conveyance of the required quantity of liquid, and perforated stoppers in the upper orifices thereof, as and for the purpose set forth.

ALBERT WAGNER.