

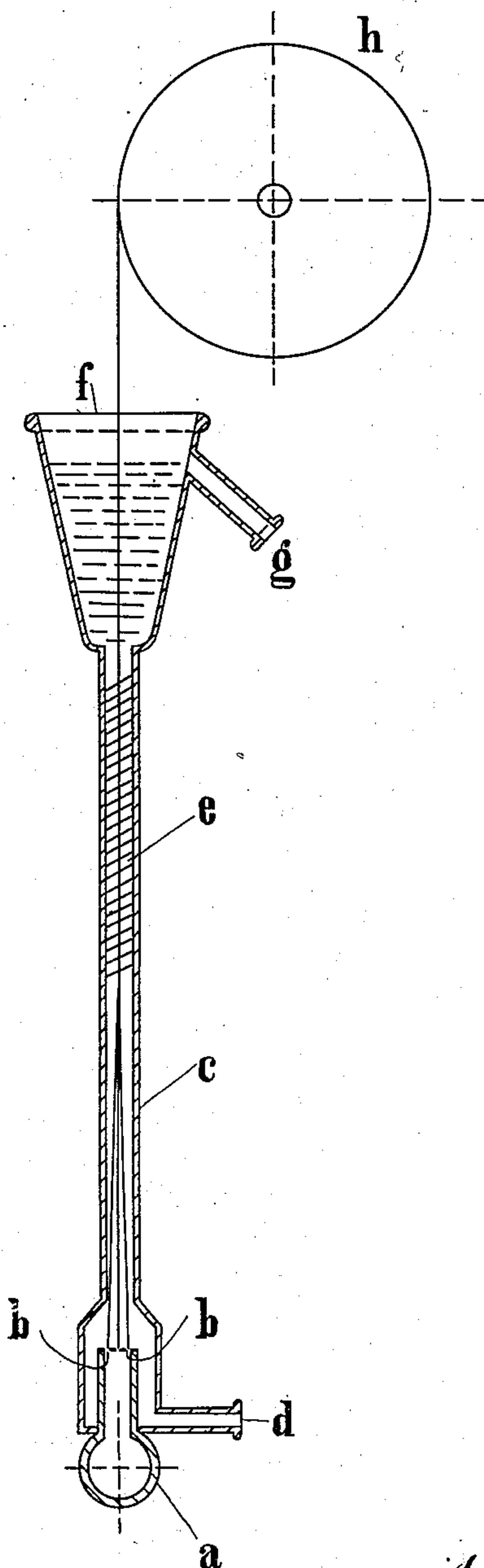
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APPARATUS FOR THE PRODUCTION OF ARTIFICIAL THREADS.

APPLICATION FILED AUG. 22, 1905.



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APPARATUS FOR THE PRODUCTION OF ARTIFICIAL THREADS.

No. 827,434.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, ERNST WILLY FRIEDRICH, a subject of the German Emperor, and a resident of Blaton, in the Kingdom of Belgium, have invented new and useful Improvements in Apparatus for the Production of Artificial Threads, of which the following is a full, clear, and exact specification.

This invention relates to an improved apparatus for the production of artificial threads. In this apparatus the separate threads which are obtained from a solution of cellulose are conducted into a coagulating-bath in the known manner and are then twisted together by the movement of the liquid in such a manner that the twisting does not occur until the threads have already been hardened by contact with the coagulating liquid. In this manner the gumming together of the separate threads, as well as the breaking of the same, are avoided, and therefore the objectionable features of such apparatus as were used heretofore, and in which the whole of the liquid is caused to rotate or in which the mouthpiece or nozzle through which the cellulose solution issues is caused to rotate in the liquid, so that the separate threads are twisted together as soon as they issue into the liquid, and the threads may be broken by the liquid moving in a direction perpendicular or nearly perpendicular to the direction of movement of the threads, are obviated.

My improved apparatus is shown in the accompanying drawing, which represents a vertical central section of the same.

a represents a tube through which the cellulose solution from which the threads are to be made is supplied to the apparatus, *b* is a mouthpiece or nozzle which contains a number of fine openings through which the cellulose solution issues, and *c* is a tube into which the coagulating liquid enters through a pipe *d*, which is arranged at right angles to the pipe *c*. The upper part of the tube *c* is provided with an interior helical groove which extends nearly up to a funnel-shaped vessel *f*, from the upper end of which a tube *g* extends in downward direction, so as to draw off the coagulating liquid. *h* is a roller upon which the thread is wound up or conducted away.

The cellulose solution from which the threads are to be produced issues from the tube *a* through a number of fine apertures in the nozzle *b* into the tube *c*, to which at the

same time the coagulating liquid is supplied through the pipe *d*. The threads issuing from the nozzle *b* are coagulated or hardened by the coagulating liquid as it passes with them in upward direction in the tube *c* in a direction parallel to the axis of the same.

The threads are twisted together on entering with the coagulating liquid into the interiorly-grooved portion *e* of the tube *c*, which, owing to its interior helical groove, imparts a rotational movement to the liquid. In case one of the threads is ruptured by the rotation imparted to them by the liquid the broken portion is immediately twisted again onto the main thread. The threads can be twisted around each other as frequently as desired by the properly-selected number of turns or windings in the helical groove portion in the tube *c*. This cannot be accomplished in apparatus in which the entire body of the liquid is rotated.

The finished thread issues from the upper part of the apparatus at *f*, while the coagulating liquid is drawn off through the pipe *g*. The thread is wound upon the roller *h* or conducted away by the same.

It is not essential that in the manufacture of threads by the apparatus shown the movement of the threads and of the coagulating liquid should be from the lower end of the apparatus upward, as described. The same may also be moved in downward direction or in any other suitable direction; but it was found by practical tests that the movement of the liquid from the lower part of the apparatus in upward direction is advantageous, for the reason that thereby the formation of air-bubbles in the tubes is avoided. Moreover, the movement of the liquid from below in upward direction is in accord with the natural tendency of the thread to rise in the liquid, owing to its low specific gravity.

The essential characteristic of my improved apparatus is that in the same the twisting together of the separate threads does not occur until every separate thread is coagulated and hardened, so that the gumming together of the threads is obviated.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In an apparatus for the manufacture of artificial threads, the combination of a supply-tube for the cellulose solution, a nozzle having capillary apertures through which the separate threads are issued, and a tube

through which the coagulating liquid flows in a direction parallel to the axis of the tube and to the direction of the movement of the threads, the upper portion of the coagulating-tube being provided with an interior helical groove for imparting a rotational movement to the coagulating liquid.

2. In an apparatus for the manufacture of artificial threads, the combination of a supply-pipe for the cellulose solution, a nozzle on said supply-pipe having capillary openings through which the separate threads issue, a vertical tube connected with the supply-pipe through which the coagulating liquid flows in upward direction parallel to the axis of the

tube and parallel to the direction of movement of the threads, the upper portion of the vertical tube being provided with an interior helical groove, and a funnel-shaped liquid vessel in the upper part of the coagulating-tube provided with a discharge-tube for the coagulating liquid.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

ERNST WILLY FRIEDRICH.

Witnesses:

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