E. POHL.

APPARATUS FOR LUSTERING AND FINISHING SILK FILAMENTS.

APPLICATION FILED OCT. 14, 1905.

920,775. **Patented May 4, 1909.**

2 SHEETS—SHEET 1.

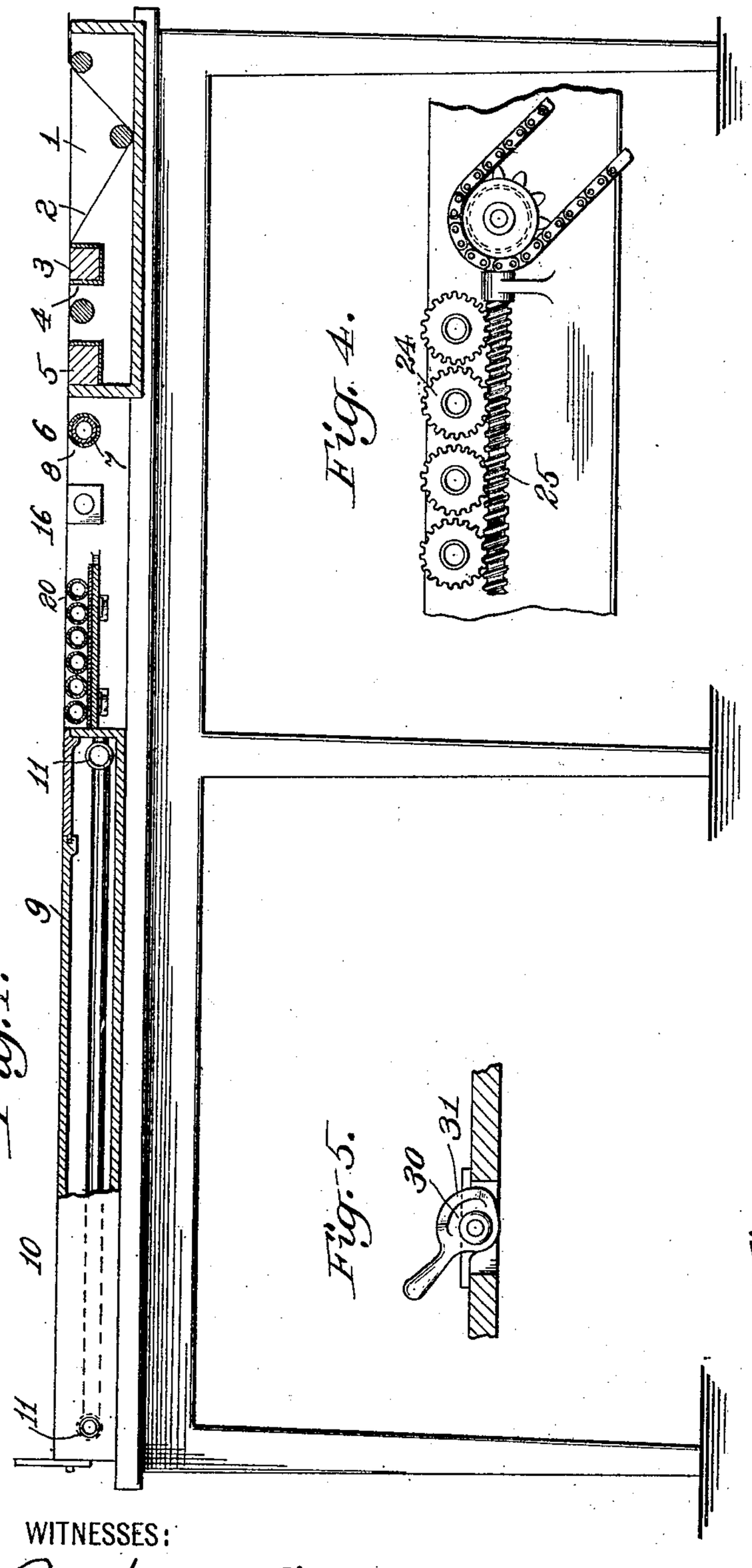

Fig. 1.

Fig. 4.

Fig. 5.

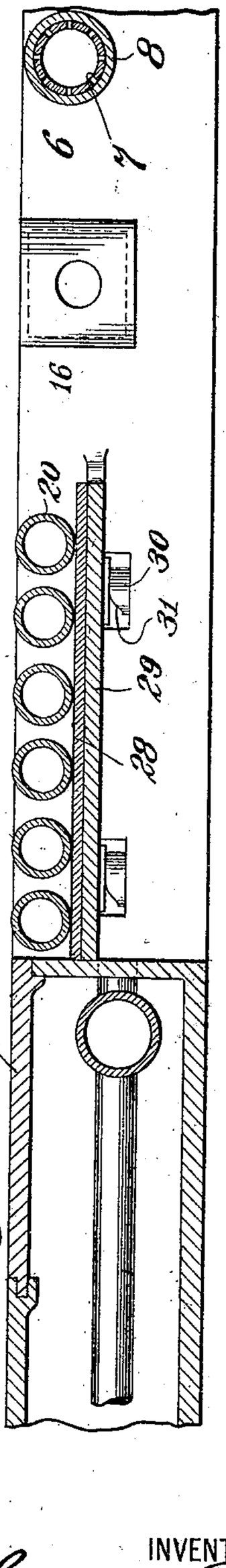

Fig. 3.

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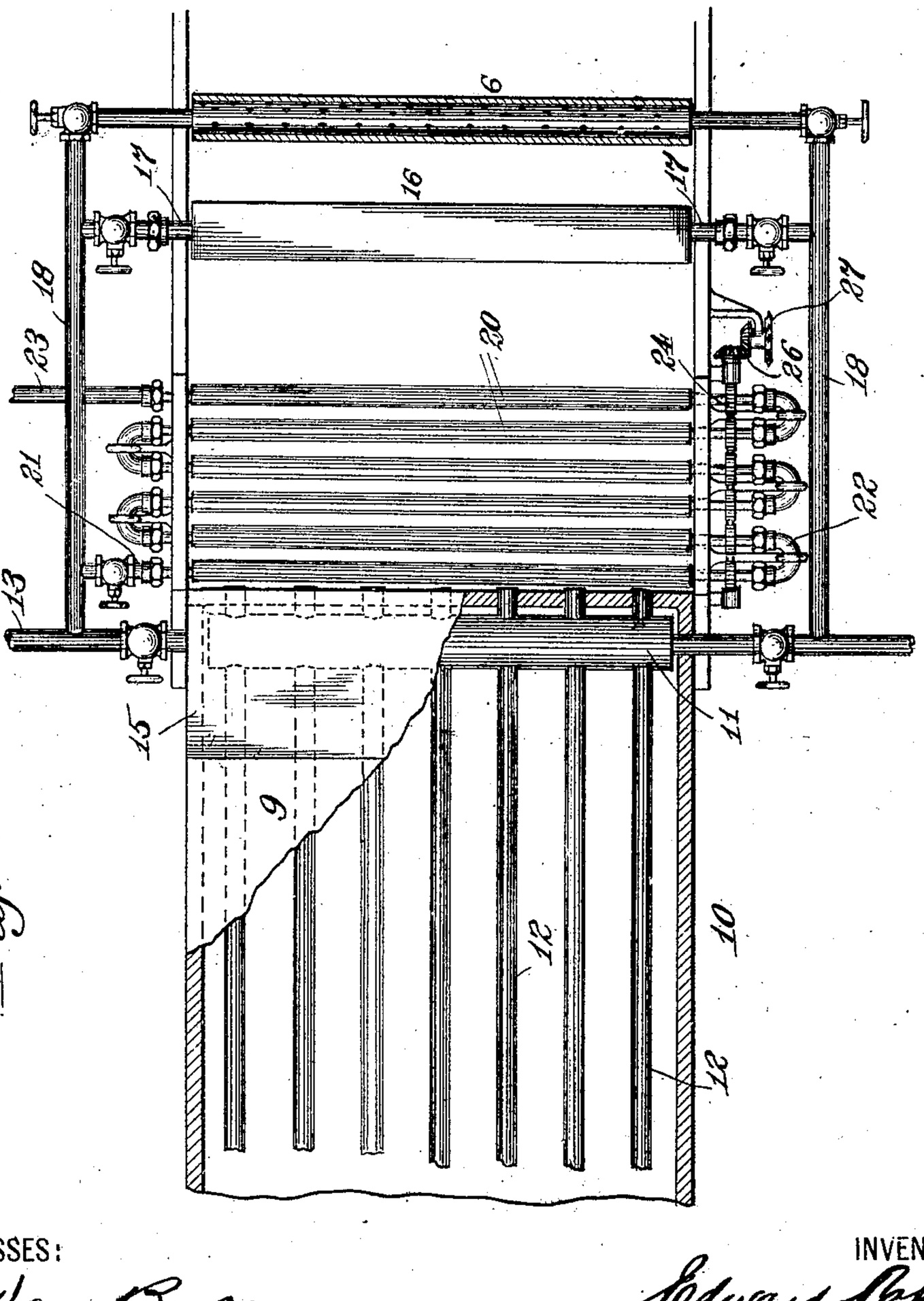

Fig. 2.

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APPARATUS FOR LUSTERING AND FINISHING SILK FILAMENTS.

No. 920,775. Specification of Letters Patent. Patented May 4, 1909.

Application filed October 14, 1905. Serial No. 282,703.

To all whom it may concern:

Be it known that I, EDWARD POHL, a subject of the Crown of Austria, and resident of Paterson, county of Passaic, State of New Jersey, have invented certain new and useful Improvements in Apparatus for Lustering and Finishing Silk Filaments, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

In apparatus of the class to which this invention relates, means are provided for immersing silk filaments in a bath containing a suitable liquid, and for drying and lustering the filaments by carrying them from the bath over a heated surface. In practice it is found that the threads often carry an excess of the liquid from the bath, that is to say, a greater amount than can be absorbed and finally retained by the filaments. Such excess of the liquid is then apt to be deposited upon the approach end of the heated contact surface, and as a result the heated contact surface quickly becomes fouled, whereby the threads in passing thereover are dirtied. The result of this is a streaked product, and it may be noted that not only does a foul surface of the table dirty the filaments as they pass over it, but the polishing is apt to be uneven and unequal so that a streaked product results not only from a dirtying of the threads but also from such uneven ironing.

In a co-pending application which is filed as a divisional of the present application, I have shown means whereby the approach end of the heated contact surface is readily removed so that it may be quickly cleaned with a minimum loss of time due to stopping the machine, and in a recent patent which was issued to me on the 26th of December, 1905, No. 808,402, an apparatus is disclosed in which a member is provided for preliminary contact with the threads, said member being designed to receive the initial deposit which would otherwise be carried over to the main heated contact surface, the said member being in polygonal cross-section and arranged to be rotated from time to time, whereby to bring up fresh surfaces for engagement with the threads so that the other surfaces are then free to be cleansed by hand without the necessity of stopping the machine. In this case the said member is stationary during the normal operation of the machine, but is partially rotated from time to time for the purposes above set forth only.

In my present invention I provide one or more heated contact members for the threads, such as rollers, and in connection therewith I employ a cleaning device. The members are rotated continuously during the operation of the machine, and preferably, though not necessarily, the said members are rotated at a speed or in a direction whereby the surfaces thereof move relatively with respect to the threads or filaments as they pass thereover. The cleaning device engages the surface of the member or members constantly and the surface of the members also moves relatively with respect to the said cleaning device, so that the cleaning device acts constantly to clean the members from any material which may be deposited thereon from the threads. By this means I so act upon the threads as to constantly and continuously remove excess material therefrom before the threads reach the stationary heated contact surface, the device for so removing the excess material being constantly cleansed so that it is always in a clean condition when acting upon the threads.

My invention also consists in certain details of construction and combination of parts including a means, whereby the cleaning device may be quickly removed and renewed at will, such as will more fully appear hereinafter, and in order that my invention may be thoroughly understood, I will now proceed to describe in detail an apparatus constituting an embodiment of my invention, having reference to the accompanying drawings illustrating the same, and will then point out the novel features in claims.

In the drawings: Figure 1 is a view in partial side elevation and partial central vertical section of an apparatus embodying my invention. Fig. 2 is a partial top view of the same, certain parts being broken away in order to more fully illustrate other parts. Fig. 3 is a partial vertical section through the device showing certain parts on a scale larger than is employed for Fig. 1. Fig. 4 is a fragmentary view in side elevation of certain parts including the driving mechanism for the rollers. Fig. 5 is a detail view showing a device employed for removably supporting the cleaning and wiping means for the rollers.

In the device herein illustrated a bath 1 contains the required liquid through which

silk filaments 2 are drawn; the filaments then pass over a sponge 3 arranged in a perforated trough 4, and over a felt pad 5 suitably supported, whereby a large portion of the superfluous liquid carried by the filaments is returned to the bath, or suitably absorbed. A heated absorber 6, comprising a steam pipe 7, preferably having a large number of fine perforations therein and suitably covered with felt 8 or other absorbent material, may be located at a point just beyond the bath, so that the filaments will pass thereover, but the said absorber may be dispensed with, if preferred, and forms in any event no part of my present invention. Thence the filaments may pass over a flat-sided member 16, revolubly mounted upon trunnions 17 comprising branches from steam pipes 18. This member is the member above referred to as forming the subject matter of U. S. Letters Patent No. 808,402, and is preferably provided with a plurality of flat sides arranged at equal distances from its axis of rotation, whereby successive sides may be presented for engagement with the filaments as desired; the said member is hollow and steam is admitted from the pipes 18 to the interior thereof, whereby the said member is heated. This member may also be employed, or not, as may be desired.

The main stationary heated contact surface may conveniently be formed as the top of a steam table 10. This steam table is heated by means of a steam pipe comprising heaters 11 and radiating pipes 12; the steam pipes 12, above referred to, may conveniently be formed as branches between the front and rear headers, as shown. Steam is admitted from a suitable source of supply through a supply pipe 13 connecting with the front header, and will then discharge through any convenient outlet or outlets. I have shown the approach end of the steam table as arranged in the form of a separate and removable portion 15, the same being secured in position by any suitable means, and readily removable when desired for the purposes above set forth. This removable portion forms no part of my present invention, but is set forth in detail and claimed in a co-pending application Serial No. 436,286 filed in the Patent Office on the 2d day of June, 1908, as a divisional of this present application.

Just in advance of the approach end of the table I have provided a plurality of rollers 20. These rollers are arranged with their upper surfaces in a plane with the said stationary heating contact surface, whereby the threads may pass thereover, and in contact therewith, in passing to the said heated contact surface. It may be here noted that a suitable take-up means is always provided in this class of apparatus at the opposite end of the steam table, by which the threads are drawn from the bath and over the steam table. These rollers are themselves heated by suitable means, as for instance, by a branch connection 21 with one of the steam pipes 18, the steam passing from such branch connection into the first roller, and then around an elbow 22 through successive rollers (the said rollers being hollow) until it is finally exhausted through the last roller 23. Suitable means is provided for rotating the rollers, such means here shown as comprising worm wheels 24 upon the rollers, and a worm wheel 25 with which the worm wheels are in engagement, the said worm being driven by means of miter gearing 26 and a sprocket connection 27. Preferably the rollers are driven differentially with respect to the threads passing thereover, that is to say, the surfaces of the rollers in contact with the threads will move relatively with respect to the said threads. This relative movement may be produced by moving the rollers in the same direction as the threads, but at a different rate of speed than that at which the threads travel, or the said rollers may be moved in a direction opposite to the direction of movement of the threads. By means of this relative movement the excess of liquid which is carried by the threads is more thoroughly removed from the threads, and, furthermore, this continuous movement of the rollers enables the said rollers to be continuously cleansed by means of suitable cleaning means arranged in continuous engagement with the said rollers. The cleaning means here shown comprises a pad of felt 28, or other yielding material, the same being carried by a platen suitably supported by the frame work, so that the felt will be kept in intimate engagement with the peripheries of the said rollers. Because of the foregoing arrangement the rollers 20 will in their revolution tend to clean, dry, and produce a preliminary ironing effect upon the advancing filaments, and will themselves be continuously cleaned and wiped by the layer of felt. The said cleaning pad, together with the platen, may be quickly removed by removing the support, so that the cleansing means will itself be cleansed or replaced quickly without stopping the machine. For the purpose of easily and expeditiously effecting the removal and replacement of the cleaning means, I have provided swinging catches 30, as shown in detail in Fig. 5, which may be swung clear of the platen when it is desired to release the same. These catches have cam surfaces 31, whereby the platen and cleaning pad may be forced forward so as to intimately engage the peripheries of the said rollers, as is desirable. Other forms of catches or supporting devices may, of course, be employed.

An apparatus constructed in accordance with my invention may be operated practi-

cally continuously without the usual intermissions for cleaning purposes, such as are generally necessary in this class of machine, for the members 20 will so cleanse, dry and initially iron the filaments as to prevent their fouling the table as heretofore. The rollers are self-cleaning, and, should their cleaning means require renewal as above explained, such renewal or renovation may take place easily and expeditiously while the machine is still running.

What I claim is:

1. In a machine for finishing and lustering silk filaments, the combination with means for applying a finishing solution to the filaments, and a heated contact member over which the said filaments are arranged to travel after such finishing solution has been applied thereto, of means for imparting movements to the said heated contact member relative with respect to the movements of the filaments thereover, whereby to polish the said filaments, and means for cleaning the contact surface of the said member while the filaments are traveling thereover.

2. In a machine for finishing and lustering silk filaments, the combination with means for applying a finishing solution to the filaments, and a heated contact member over which the said filaments are arranged to travel after such finishing solution has been applied thereto, of means for imparting movements to the said heated contact member in a direction opposite to the direction of travel of the filaments thereover, whereby to polish the said filaments, and cleaning means engaging the contact surface of the said heated contact member, for cleaning the same while the filaments are traveling thereover.

3. In a machine for finishing and lustering silk filaments, the combination with means for applying a finishing solution to the filaments, of heated contact means over which the threads are arranged to travel after such finishing solution has been applied thereto, the movement of the said filaments over the said heated contact means being a relative one with respect to portions of the contact surface thereof, with which the said filaments are engaging at the time, whereby the said filaments are polished, of means for engaging a portion of the said heated contact means to cleanse the same while the filaments are traveling thereover.

4. In a machine for finishing and lustering textile filaments, the combination with a bath for containing a liquid in which the filaments are to be immersed and a stationary heated contact surface over which the filaments are arranged to travel, of a contact member over which the filaments are arranged to pass, the said member located between the bath and the contact surface, and means for cleansing the surface of the said contact member.

5. In a machine for finishing and lustering textile filaments, the combination with a bath for containing liquid in which the filaments are to be immersed, and a stationary heated contact surface over which the filaments are arranged to travel, of a roller over which the filaments will travel, the said roller located between the bath and the contact surface, and means for cleansing the periphery of the roller.

6. In a machine for finishing and lustering textile filaments, the combination with a bath for containing a liquid in which the filaments are to be immersed and a stationary heated contact surface over which the filaments are arranged to travel, of a moving heated contact surface, located between the stationary heated contact surface and the bath, cleaning means for engagement with the surface of the said moving heated contact surface, and means for causing the said last named heated contact surface to move with respect to the cleaning means.

7. In a machine for finishing and lustering textile filaments, the combination with a bath for containing liquid in which the filaments are to be immersed, and a stationary heated contact surface over which the filaments are arranged to travel, of a heated roller over which the filaments will travel located between the bath and the contact surface, means for rotating the roller differentially with respect to the movement of the filaments thereover, and means engaging the periphery of the roller to cleanse same.

8. In a machine for finishing and lustering textile filaments, the combination with a bath for containing liquid in which the filaments are to be immersed, and a stationary heated contact surface over which the filaments are arranged to travel, of a heated roller over which the filaments will travel, located between the bath and the contact surface, means for rotating the roller differentially with respect to the movement of the filaments thereover, means engaging the periphery of the roller to cleanse same, and releasable supporting means for the said cleaning means.

9. In a machine for finishing and lustering textile filaments, the combination with a bath for containing liquid in which the filaments are to be immersed, and a stationary heated contact surface over which the filaments are arranged to travel, of a heated roller over which the filaments will travel, located between the bath and the contact surface, said roller arranged to rotate differentially with respect to the movement of the filaments thereover, a yielding pad in engagement with the periphery of the roller for cleansing same, a stationary platen for supporting said pad, and means for removably supporting said platen.

10. In a machine for finishing and luster-

ing textile filaments, the combination with a bath for containing liquid in which the filaments are to be immersed, and a stationary heated contact surface over which the filaments are arranged to travel, of a plurality of heated rollers over which the filaments will travel, located between the bath and the contact surface, means for rotating the rollers differentially with respect to the movement of the filaments thereover, whereby the surface thereof in contact with the threads will move with relation to the said threads, and means engaging the peripheries of the rollers to cleanse same.

11. In a machine for finishing and lustering textile filaments, the combination with a bath for containing a liquid in which the filaments are to be immersed and a stationary heated contact surface over which the filaments are arranged to travel, of a plurality of heated rollers arranged with their axes in a plane parallel with the heated contact surface, and arranged between the heated contact surface and the bath, the said filaments arranged to pass over all of the said rollers before passing on to the said heated surface, the said rollers arranged to rotate differentially with respect to the movement of the said filaments thereover, whereby the surface thereof in contact with the threads will move with relation to the said threads, and means engaging the periphery of the rollers to cleanse them.

12. In a machine for finishing and lustering textile filaments, the combination with a bath for containing liquid in which the filaments are to be immersed, and a stationary heated contact surface over which the filaments are arranged to travel, of a plurality of heated rollers arranged with their axes in a plane parallel with the heated contact surface, and arranged between the heated contact surface and the bath, the said filaments arranged to pass over all of the said rollers before passing on to the said heated surface, the said rollers arranged to rotate differentially with respect to the movement of the said filaments thereover, whereby the surface thereof in contact with the threads will move with relation to the said threads, a yielding pad arranged beneath the said rollers, a platen supporting said yielding pad, and means for supporting said platen.

New York, N. Y., October 13th, 1905.

EDWARD POHL.

Witnesses:

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LYMAN S. ANDREWS, Jr.