

No. 775,621.

PATENTED NOV. 22, 1904.

A. FANKHAUSER, A. RYSER & F. J. B. KNIBIEHLER.

APPARATUS FOR DYEING, &c.

APPLICATION FILED NOV. 11, 1903

NO MODEL.

2 SHEETS—SHEET 1.

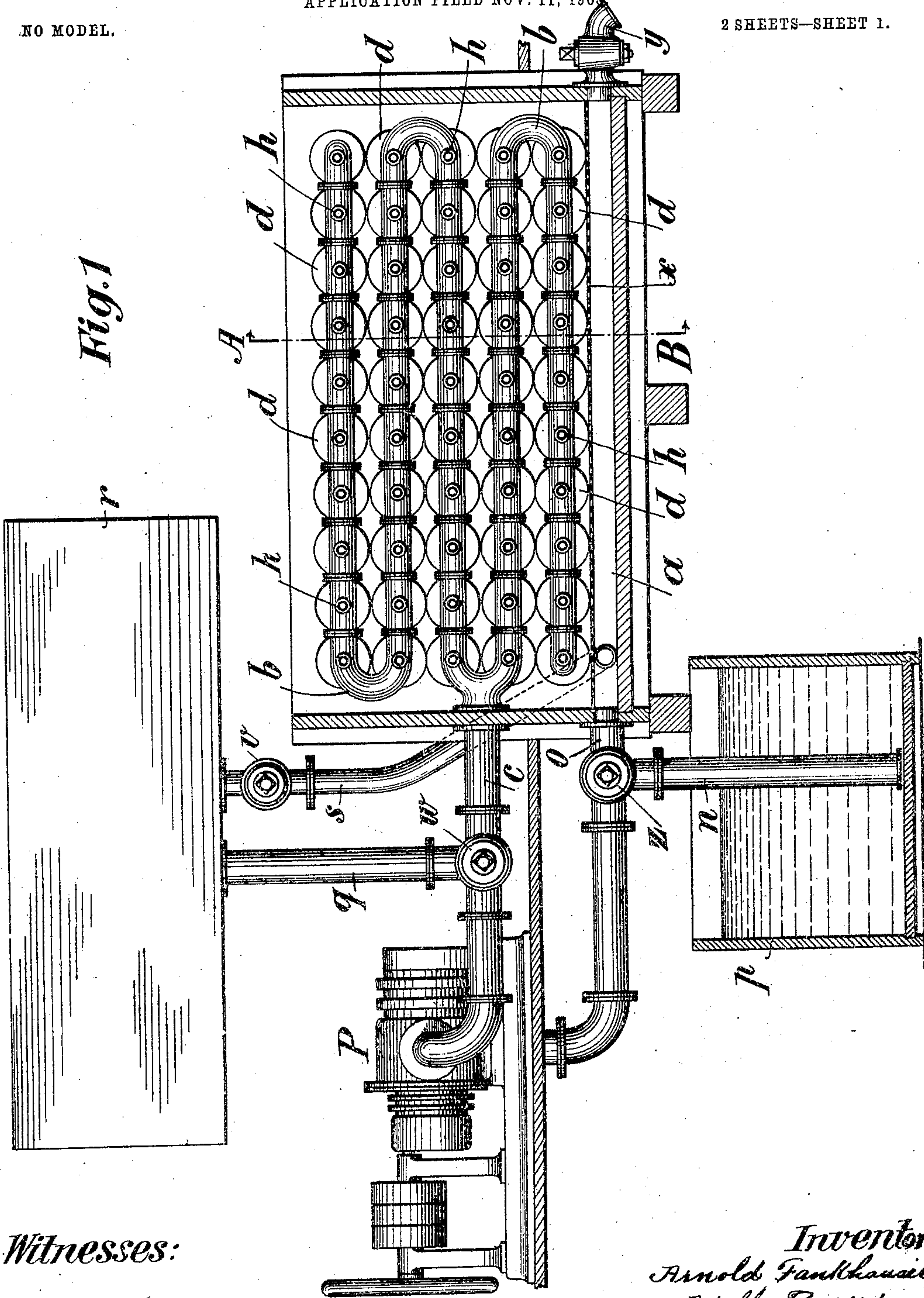


Fig. 1

Witnesses:

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W. Sommers

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Friedrich J. B. Knibiehler.
By *Klein Orth & Co.* Attys.

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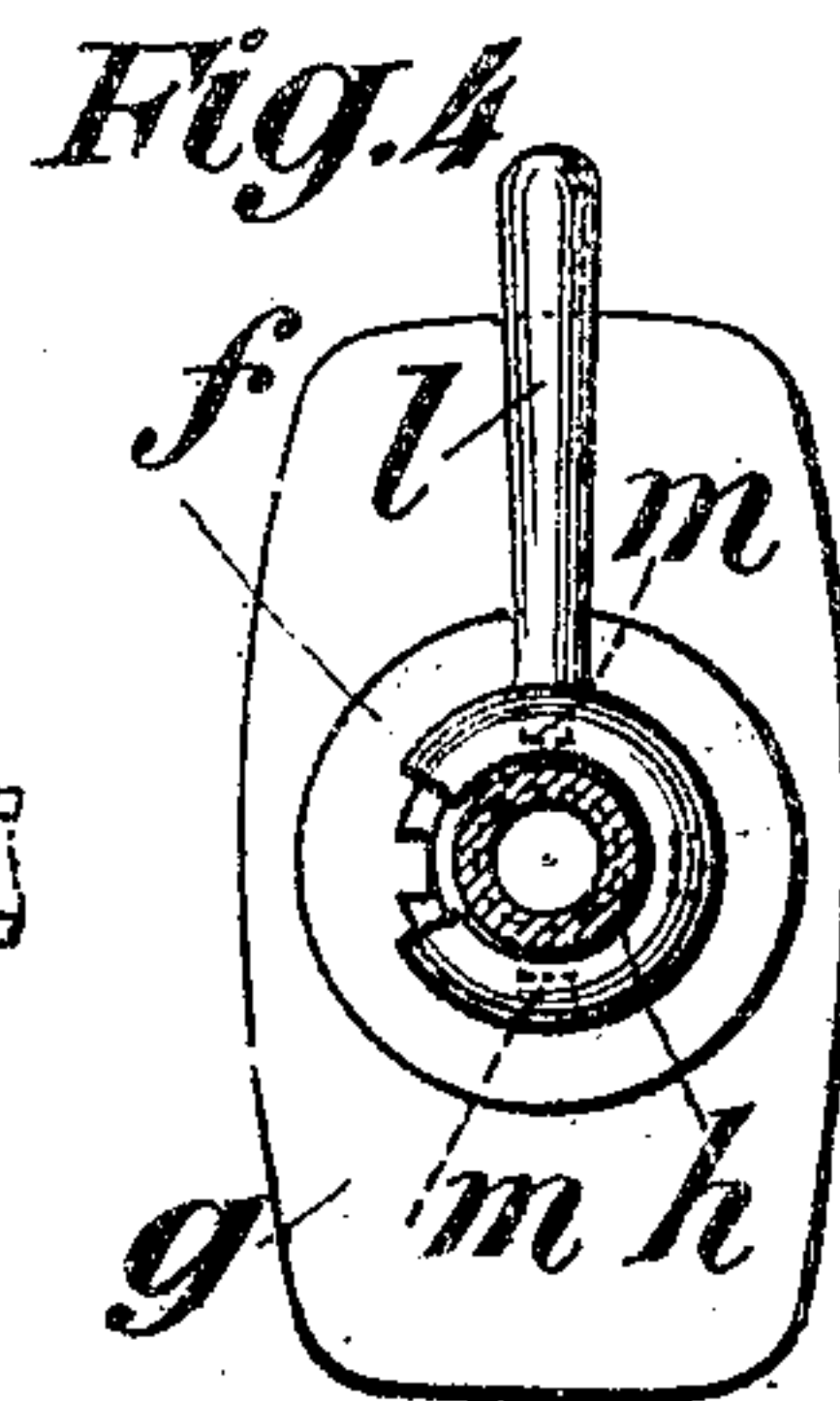
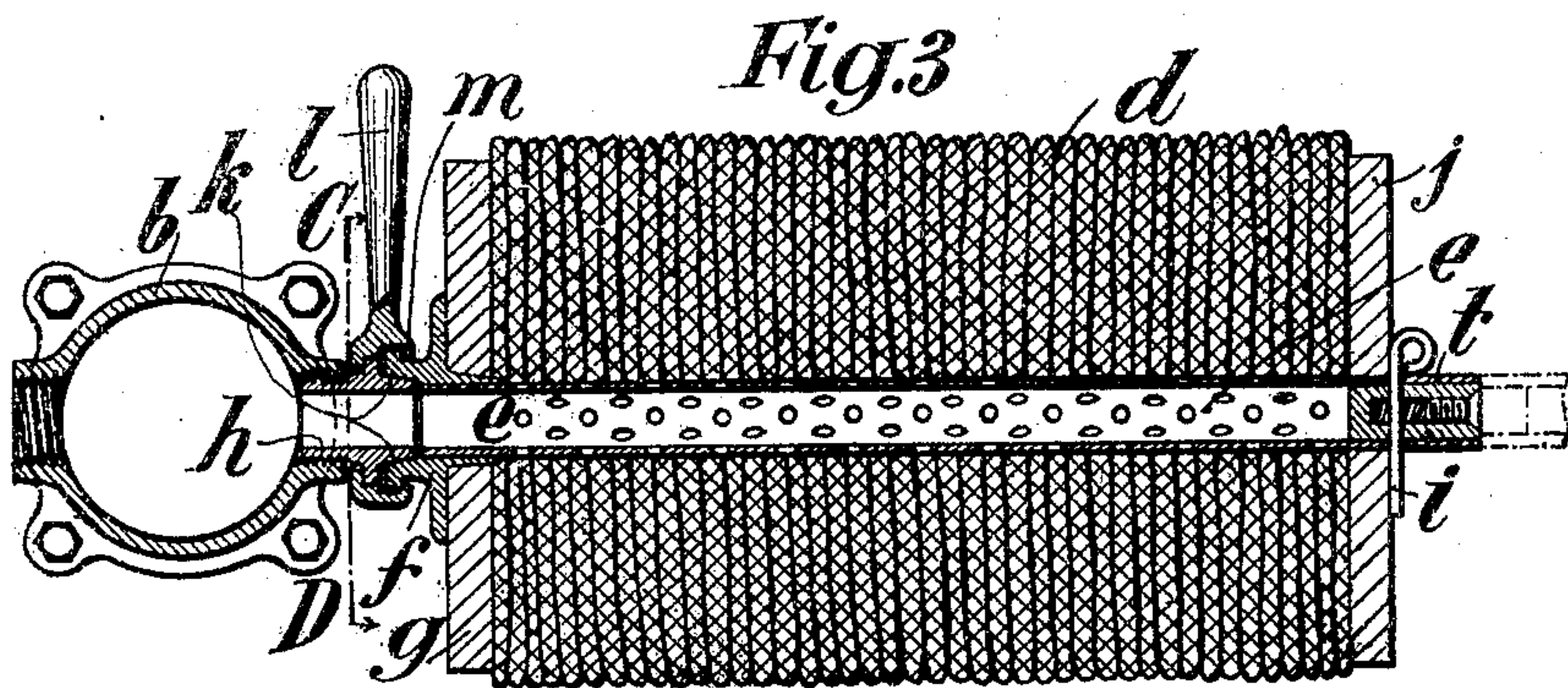
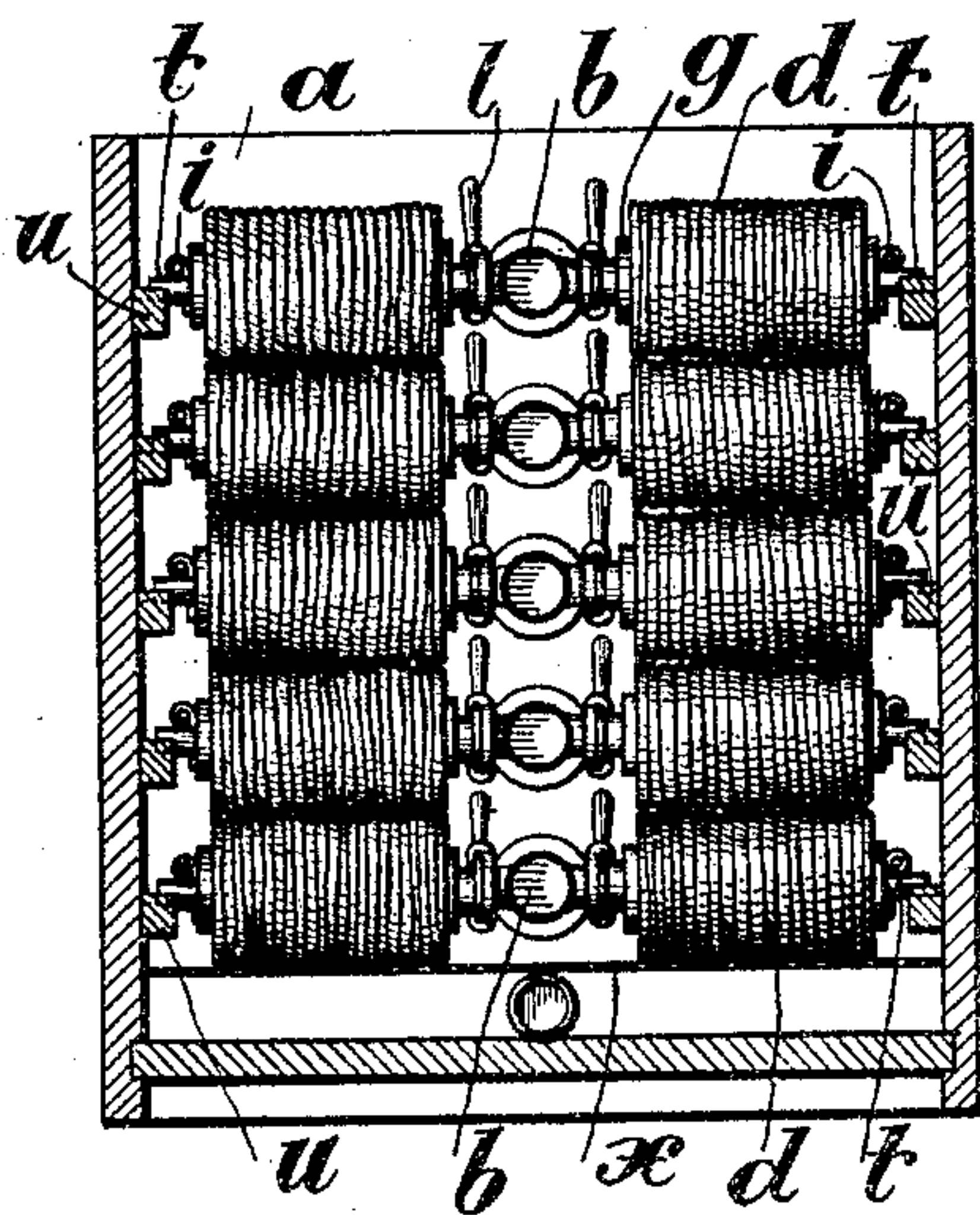
APPARATUS FOR DYEING, &c.

APPLICATION FILED NOV. 11, 1903.

NO MODEL.

2 SHEETS—SHEET 2.

Fig. 2.



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UNITED STATES PATENT OFFICE.

ARNOLD FANKHAUSER AND ADOLF RYSER, OF BADEN, SWITZERLAND,
AND FRIEDRICH JOHANN BAPTIST KNIBIEHLER, OF LÖRRACH, GER-
MANY, ASSIGNORS TO THE FIRM OF WEGMANN & CO., OF BADEN,
SWITZERLAND.

APPARATUS FOR DYEING, &c.

SPECIFICATION forming part of Letters Patent No. 775,621, dated November 22, 1904.

Application filed November 11, 1903. Serial No. 180,752. (No model.)

To all whom it may concern:

Be it known that we, ARNOLD FANKHAUSER and ADOLF RYSER, citizens of the Republic of Switzerland, residing at Baden, Switzerland,
5 and FRIEDRICH JOHANN BAPTIST KNIBIEHLER, a subject of the Emperor of Germany, residing at Lörrach, Grand Dukedom of Baden, Germany, have invented new and useful Improvements in Apparatus for Dyeing Cotton and the Like, of which the following is a specification.

The dyeing of cotton has hitherto been usually effected in the roving from the coarse flier or in the cotton flocks. The dyeing of
15 the roving from the coarse flier has the drawback that the dyeing of the final product when the roving is finished is not absolutely uniform. The dyeing of cotton flocks has the drawback of causing great waste.

20 This invention relates to an apparatus for dyeing cotton and the like in which the sliver is dyed by means of perforated sockets or holders, whereby the above-mentioned drawbacks are removed. A form of construction of this apparatus is shown as an example in the accompanying drawings, in which—

30 Figure 1 is an elevation and partial section of the apparatus. Fig. 2 is a section on the line A B of Fig. 1; Fig. 3, a detail on an enlarged scale; Fig. 4, a section on the line C D of Fig. 3.

The spirally-bent pipe is located in a vessel *a*, Fig. 1, the coils of which tube lie vertically above one another and are provided at both
35 sides with attachment-nozzles *h*. These attachment-nozzles serve for connecting perforated holders or sockets *e*, Fig. 3, which are closed at one end and at the other end are each provided with a plate *g*. These holders
40 have also head-pieces *f* at the end which is provided with the plate *g*, which head-pieces have a tapering bore *k*, in which the suitably-formed ends of the attachment-nozzles *h* are inserted. Revolvable keys *l* are arranged on
45 the attachment-nozzles, which are adapted to

engage, by means of projections *m*, Figs. 3 and 4, over the edges of the socket or holder heads *f*, such edges being provided with inclined planes. For the passage of the projections when inserting the socket-heads on
50 the nozzle ends these edges are provided with suitable slots, Fig. 4. The closed ends *t* of the holders or sockets *e* rest on supports *u*, Fig. 2, arranged on the inner faces of the walls of the vessel *a*. The piping *b*, Fig. 1,
55 is connected with a pump *p* by means of a pipe *c*, which pump in turn is connected, by means of a pipe *o*, with the vessel *a*, the pipe *n* branching off from the pipe *o*, which is immersed in a dye-bath vat *p*. The pipe *c* is
60 connected by a pipe *q* with a water-washing tank *r*, which is connected by a pipe *e* with the vessel *a*. A three-way cock *w* is mounted at the point where the pipe *q* branches off the pipes *c* and a three-way cock *z* at the place
65 where the pipe *n* branches off the pipe *o*. A shut-off valve *v* is provided on the pipe *s*. Above the bottom of the vat *a* there is a sieve or straining-bottom *x* and beneath the latter a discharge-tap *y* on one wall of the vat *a*.
70

The closed ends *t* of the perforated sockets or holders *e* are provided with an extension-bar (shown in Fig. 3 in dotted lines) and fit with the plate *g*, attached thereto, directed
75 downward into the sliver-can, where the sliver laps itself round the socket and their extension-bars. After the sockets and their extension-bars are surrounded along their entire length the band of sliver is compressed to a minimum by means of disks *j*, closed
80 over the prolongations of the sockets *e*, and maintained at this size by means of pins pushed through the closed ends *t* of the sockets beyond the disks, Fig. 3. After the extension-bars, which are now superfluous, have
85 been removed the sockets *e*, together with the sliver-band wound round them, are connected with the attachment-nozzles *h* of the pipe *b*, the socket-heads *f*, with their tapering bores
90 *k*, being brought onto the correspondingly-

formed ends of the attachment-nozzles, and then by turning the revoluble keys *l*, arranged on the attachment-nozzles, the heads of the sockets are firmly clamped on the attachment-nozzles by the projections of the keys *l* sliding on the inclined planes of the edges of the socket-head. The perforated sockets *e* are supported at their closed ends *t* on the supports *u*, Fig. 2. The actual dyeing can then be proceeded with. For this object the dyestuff is drawn from its tank *p* by means of the pump *P* after the connection of the pipe *o* with the vessel *a* has been cut off by turning the three-way cock *z* and connection with the pipe *n* established, and the dye liquor is forced along the course *n o P e* into the piping *b* and in further succession through the attachment-nozzles *h* into the perforated sockets *e*, Fig. 3, and through the holes in the latter through the band-sliver and then accumulates in the vessel *a*. If the three-way tap *z* of the pipe *n* be closed and the connection of the pipe *o* with the vessel *a* be reestablished, the dye-bath may describe a continuous circulation *o P e b a*. If the pump *P* be caused to run in an opposite direction, the dye-bath surrounding the sliver-band may be drawn through the sliver-band into the perforated sockets *e* and again returned to the vessel *a* by the course *b e P o*. If the connection of the vessel *a* with the dye-bath container *p* be established through the three-way cock and the pipe *o* be shut off, the dye-bath can flow directly into its vat *p*.

The washing may be effected in the following manner: If the pipe *n* be shut by means of the three-way cock *z* and the pipe *o* opened, the vessel *a* may be filled with the washing liquid through the pipe *s* after the shut-off valve *v*. Then, similarly to dyeing, the washing liquid may be caused to describe a circular course by means of the pump, and after the washing, if the pipe *c* be closed by means of the three-way cock *w* and the connection of the pipe *q* with the pump *p* established, the washing liquor may be forced back into the vessel *r* through the course *o P q*.

The perforated sockets *e* with the sliver-band wrapped round them may be removed from the vessel *a* after having been washed, the band of sliver stripped off the perforated sockets, and the latter replaced by bars for the drying of the sliver-band, which after the drying may be returned to the sliver-cans for further treatment.

In addition to the already-mentioned advantages of the prevention of waste and the obtention of a uniform dyeing the dyeing of the sliver-band by means of the apparatus shown affords the advantage of a greater production and more simple manipulation, the sliver-bands lapped round the sockets representing

large pieces, and consequently the apparatus is an inexpensive one.

Having now particularly described and ascertained the nature of the said invention and in what manner the same is to be performed, we declare that what we claim is—

1. Apparatus such as described, comprising a vat, a pipe therein closed at its ends, in combination with a spool for the reception of the sliver to be dyed, said spool having a hollow perforated spindle closed at one end, the other, open, end thereof connectible to said pipe, a bearing in the vat for the closed end of the spool-spindle and means to induce a fluid to circulate through said spool-spindle and sliver, for the purpose set forth.

2. Apparatus such as described, comprising a vat having vertical rows of bearings on opposite side walls and a series of superposed interconnected pipes intermediate said side walls and having closed terminals and nozzles facing the aforesaid bearings; in combination with spools comprising heads and a tubular perforated spindle having one end closed and the other adapted to be connected to the aforesaid nozzles, and means to induce a fluid to circulate from the pipes to the vat and back to said pipes, or from the vat to the pipes and back to the vat, for the purpose set forth.

3. In apparatus such as described, the combination with the vat, the pipe *b* therein, provided with nozzles *h* and a spool for each nozzle, said spools comprising a tubular perforated spindle closed at one end, and a conical bearing for the nozzle at the other end; of a locking device to lock said bearing substantially fluid-tight to its nozzle and means in the vat to support the other end of the spool-spindles, for the purpose set forth.

4. In apparatus such as described, the combination with the vat, the pipe *b* therein having nozzles *h* and a spool for each of said nozzles, said spools comprising a tubular perforated spindle closed at one end, a head removably connectible to the spindle, a second head secured at the open end of said spindle and a conical bearing projecting from said head fitting over the nozzle; of a locking device to separably lock the bearing substantially fluid-tight to its nozzle and a bearing in the vat for the closed end of each spool-spindle, for the purpose set forth.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

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ADOLF RYSER.

FRIEDRICH JOHANN BAPTIST KNIBIEHLER.

Witnesses:

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A. LIEBERKNECHT.