

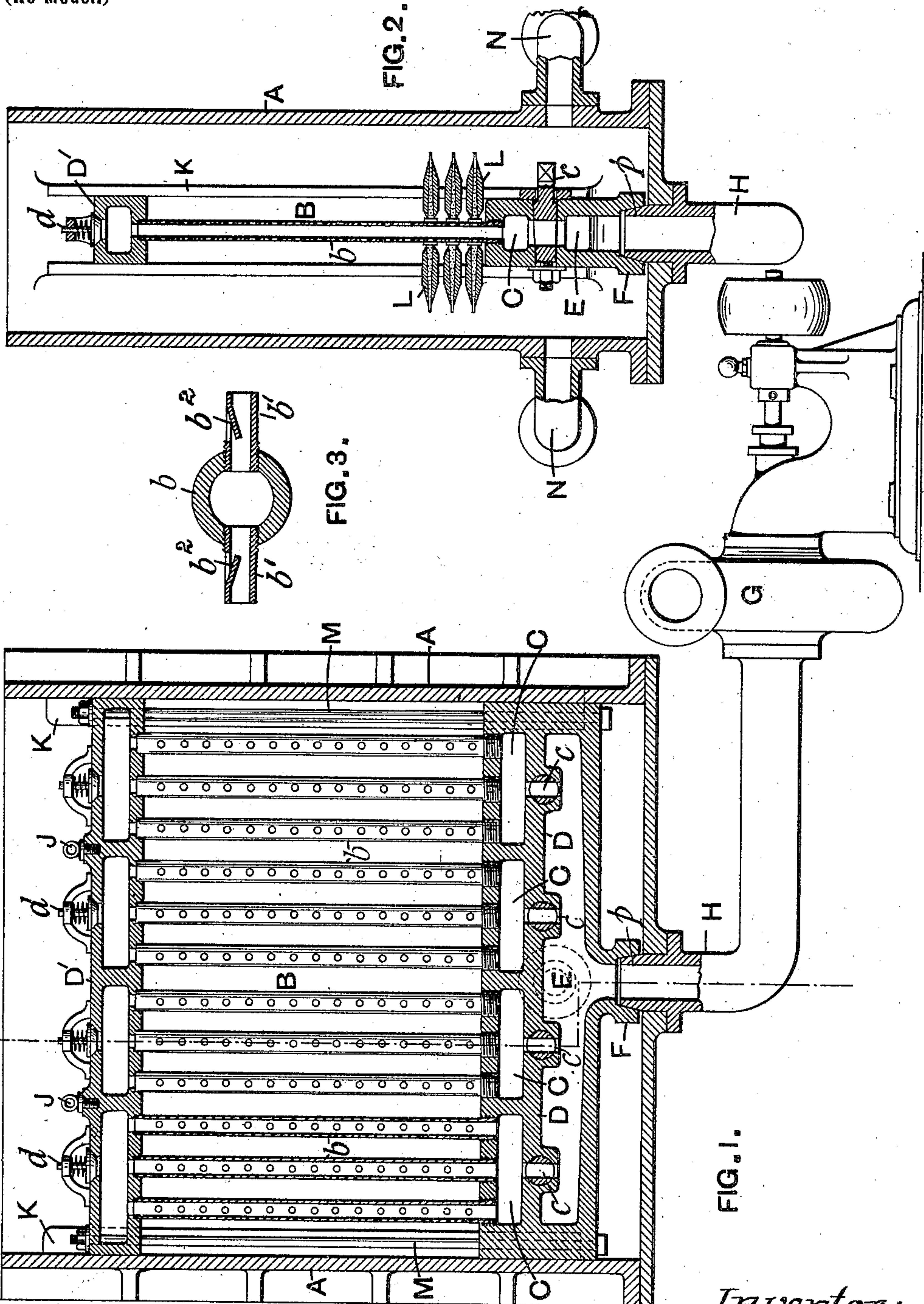
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Patented June 26, 1900.

A. MARR.
APPARATUS FOR DYEING, &c.

(Application filed Dec. 15, 1898.)

(No Model.)



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UNITED STATES PATENT OFFICE.

ALEXANDER MARR, OF MANCHESTER, ENGLAND.

APPARATUS FOR DYEING, &c.

SPECIFICATION forming part of Letters Patent No. 652,435, dated June 26, 1900.

Application filed December 15, 1898. Serial No. 699,339. (No model.)

To all whom it may concern:

Be it known that I, ALEXANDER MARR, a citizen of England, residing at Manchester, in the county of Lancaster, England, have invented certain new and useful Improvements in Apparatus for Dyeing, Bleaching, Drying, and Similarly Treating Yarn in Cops and the Like, (for which applications were filed in England September 29, 1898, No. 20,562, and in Germany November 5, 1898,) of which the following is a full, clear, and exact description.

This invention relates to apparatus for dyeing, bleaching, drying, and similarly treating yarn in cops and the like of that type in which one vessel is contained within another, the inner vessel having its walls bored or perforated for the reception of perforated spindles carrying the cops. Dyeing, washing, or bleaching liquid or the like is then forced or drawn from the space between the two vessels into the inner vessel or in the reverse direction, so that it passes through and impregnates the cops.

The object of the present invention is to so construct the inner vessel that any desired portion may be cut off and isolated from the action of the pump or other forcing device.

In the vessels and apparatus at present commonly in use when the inner vessel is not fully charged or provided with cops it becomes necessary to plug up the holes which are unprovided with cops. Otherwise the liquid or the like will flow chiefly through these holes and very little will pass through the substance of the cops. This system of plugging presents many disadvantages, among them being the amount of time wasted.

My invention consists in forming the inner cop-bearing vessel in sections or compartments, each of which opens into a common channel or opening leading to the pump or other forcing device. The passages by means of which the separate sections communicate with the common channel are furnished with suitable valves, so that they may be opened or closed at will. By these valves, therefore, any one or more of the sections of the cop-bearing vessel may be placed in communication with the pump, and the dye or other liquid or fluid will only pass through those sections the valves of which are open. Any section unprovided with cops may thus be

cut out, and the sections in a vessel may be successively or alternately placed in operation, or all or any desired number of them may be treated at once.

A convenient form of inner vessel may consist of a series of tubes arranged in groups. Each group of tubes or each tube, if desired, opens at its lower end into a separate channel, which in turn is in communication with the channel common to all the groups of tubes, the passage between the two channels being provided with a valve or cock. These channels may be formed in a base which is bored or recessed for the tube lower ends and which is formed with an opening for placing the common channel into communication with the pump or the like. The upper ends of the tubes are contained within an upper member or frame, which may, if desired, be provided with a separate chamber for each group, and each of these channels when employed may be provided with a spring-controlled valve for the escape of air when the vessel is lowered into place in the outer vessel. The upper frame and the base may be secured and drawn toward each other by tie-rods, so as at the same time to make tight joints between themselves and the tube ends. Each tube is bored, preferably along diametrically-opposite lines, for the reception of the perforated spindles upon which the cops are placed.

In order that my invention may be more readily understood, the following drawings have been annexed, of which—

Figure 1 shows the apparatus in vertical section, with the inner vessel in sectional elevation; and Fig. 2 shows the complete apparatus in vertical section at right angles with Fig. 1. Fig. 3 is a representation of one of the tubes composing a section of the inner vessel provided with nipples for the reception of the perforated spindles upon which the cops are placed.

Similar letters of reference are used to indicate similar parts where they occur in the different figures.

In the form illustrated in the drawings each section of the inner vessel consists of three tubes bored along diametrically-opposite lines, so that there are six vertical lines of cops in each section.

As will be seen, the apparatus consists of

two vessels A and B, A being the outer one, containing the dye or the like, and B being the inner one, upon which the cops are placed. The inner vessel B is divided into sections, each section consisting of the three tubes *b b*, the lower ends of each group of tubes opening into a separate compartment C C, formed in the base-plate D. Each of these compartments is provided with a cock or valve *c*, by means of which communication may be established at will with the common chamber or compartment E. This chamber E is formed or provided with a mouth or the like F, by means of which it may be placed in communication with the pump or forcing device G through the medium of the pipe H. It will thus be seen that any section may be cut out by closing its valve *c* and that no dye or the like could pass through such cut-out section when the pump is working.

In use the inner vessel B, consisting of the base-plate D, the upper plate D', and the tubular sections *b*, may be hoisted bodily out of the outer vessel by means of the eyebolts J. The ends of the perforated spindles carrying the cops are then placed in the perforations along the tubes *b*, and the vessel B is lowered back into the position shown in the figures, the mouth F of the base D engaging with the nozzle *p* of the pump-pipe and automatically making a tight joint.

K K are flanges or ribs formed on the inner face of the vessel A and adapted to guide the vessel B. In the lower part of Fig. 2 several cops L are shown in position.

Should it not be desired to treat at one time a sufficient number of cops to fully utilize all the sections *b*, those sections which are unoccupied may be cut out by their valves, as before explained.

In the form of apparatus illustrated by the drawings the upper plate is shown as provided with a corresponding number of compartments to the base-plate D, the tubes of each section opening into one or another of the compartments. Each compartment may be provided with a spring-controlled valve *d* to permit the escape of the air contained within the sections when the vessel is lowered into the dyeing or other liquid. This construction, however, is not necessary, as the upper ends of the sections may be closed or may be contained within a solid plate. The air will then escape through the perforated spindles and the substance of the cops. The upper and lower plates and the cop-bearing sections may be secured and held together by means of the screwed tubes *b* themselves or by means of the tie-rods M or by other suitable and equivalent devices.

The operation of the apparatus when the vessel B is in place upon the pump-nozzle is as

follows: The pump or other forcing or drawing device is set in motion, and liquid is drawn from the vessel A through the cops upon the sections the valves of which are open and is returned to the vessel A through the pipes N. A constant circulation is thus maintained, and the cops are thoroughly impregnated. When the operation is completed, the vessel B is withdrawn and the cops may be removed, or the complete vessel still bearing the cops may be removed to another apparatus for bleaching, drying, or the like operation, this operation being carried out by the passage through the cops of a suitable liquid, fluid, or the like in a manner similar to that already described.

In Fig. 3 is illustrated a cross-section of one of the circular tubes *b*, furnished with nipples *b'* for the reception of the ends of the perforated cop-spindles. As illustrated, the ends of these nipples are screwed into the tubes and may be soldered in place. They are preferably provided with a depressed or slit portion *b''*, which may act as a spring to hold the spindle in place. These nipples are not absolutely necessary; but it will be found advantageous to employ them with small circular tubes, such as *b*.

Although the sections of the inner vessel B have been described and illustrated as consisting of three tubes each, it will of course be understood that one or any number of tubes may be employed of flattened, circular, or other desired cross-section or that the inner vessel may be formed as a box or casing and divided into sections by suitable partitions or the like.

The form of vessel illustrated is only intended to serve as a type.

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

In an apparatus for dyeing, bleaching, drying and similarly treating yarn, the combination of a tank and a structure therein, consisting of an upper and a lower hollow head each divided into corresponding compartments by suitable partitions, perforated tubes connecting corresponding compartments together, one of said heads provided with independent valved passages leading to the compartments therein, and also provided with a passage into which all of the independent passages lead, substantially as described.

In witness whereof I subscribe my signature in presence of two witnesses.

ALEXANDER MARR.

Witnesses:

WILLIAM GEO. HEYS,
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