(No Model.) 3 Sheets—Sheet 1.

W. BIRCH.

ROLLER FOR WASHING OR DYEING MACHINES.

No. 379,442. Patented Mar. 13, 1888.

FIG: 2.

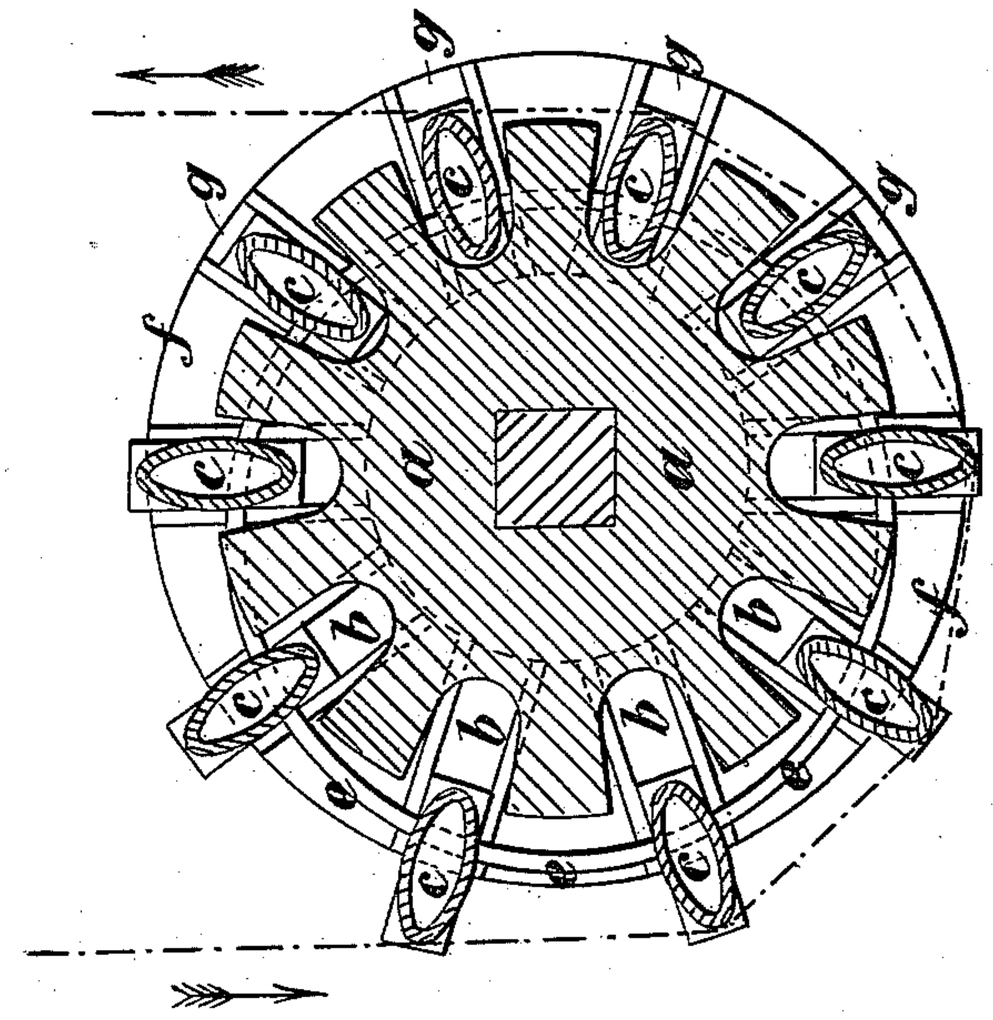
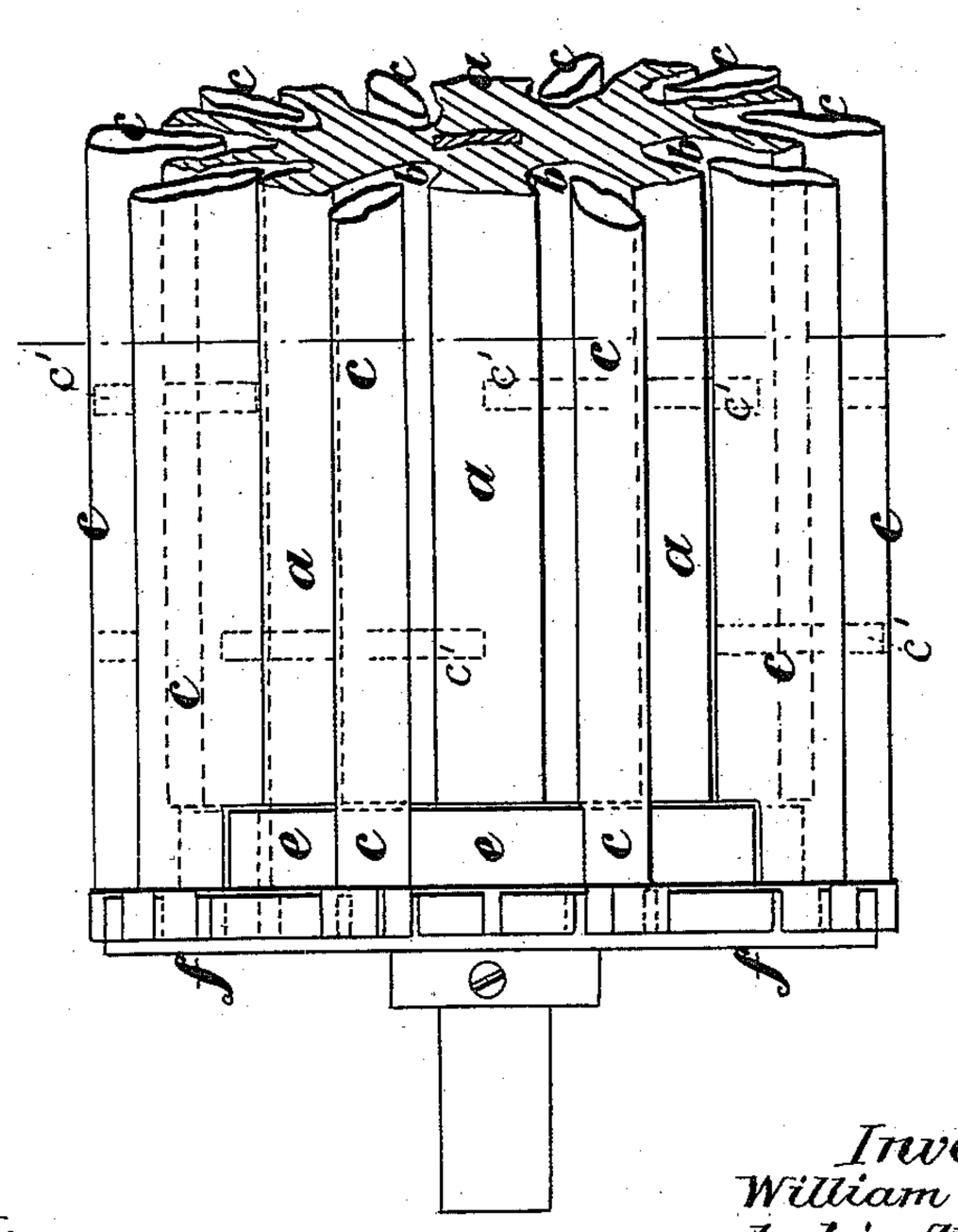


FIG: 1.



Witnesses:
John E. Parker.
William D. Conner.

Inventor:
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by his Attorneys
Howson and Sons

(No Model.) 3 Sheets—Sheet 2.

W. BIRCH.

ROLLER FOR WASHING OR DYEING MACHINES.

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FIG: 5.

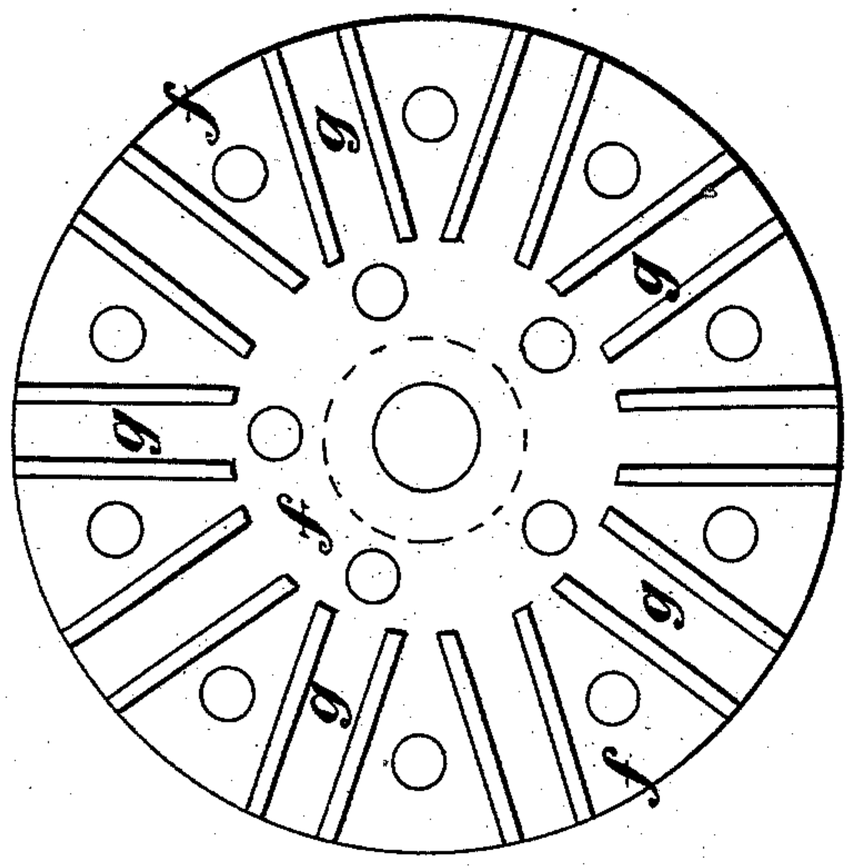
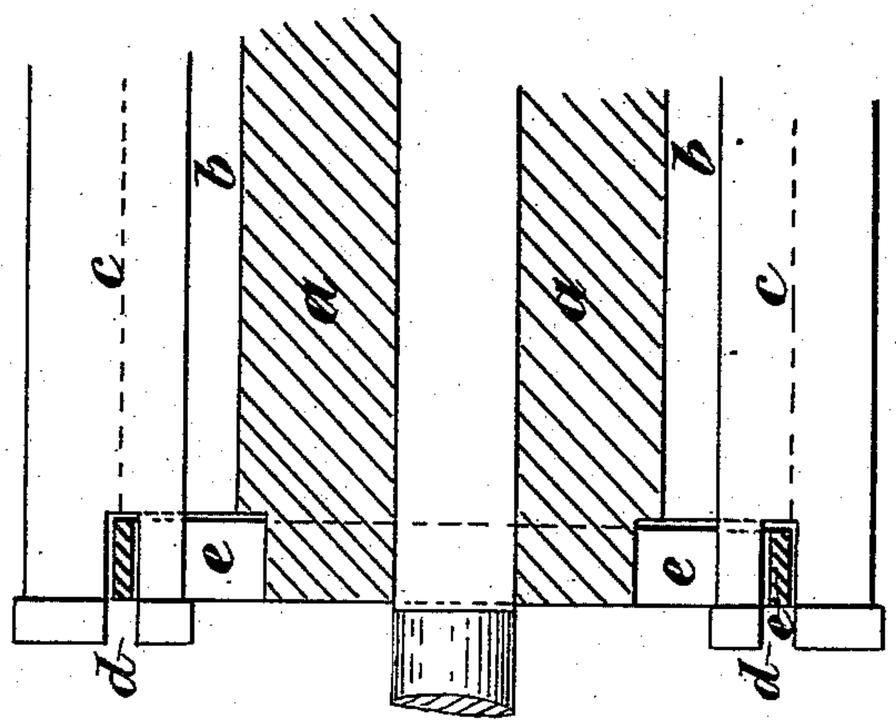


FIG: 3.



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(No Model.) 3 Sheets—Sheet 3.

W. BIRCH.

ROLLER FOR WASHING OR DYEING MACHINES.

No. 379,442. Patented Mar. 13, 1888.

FIG: 3.

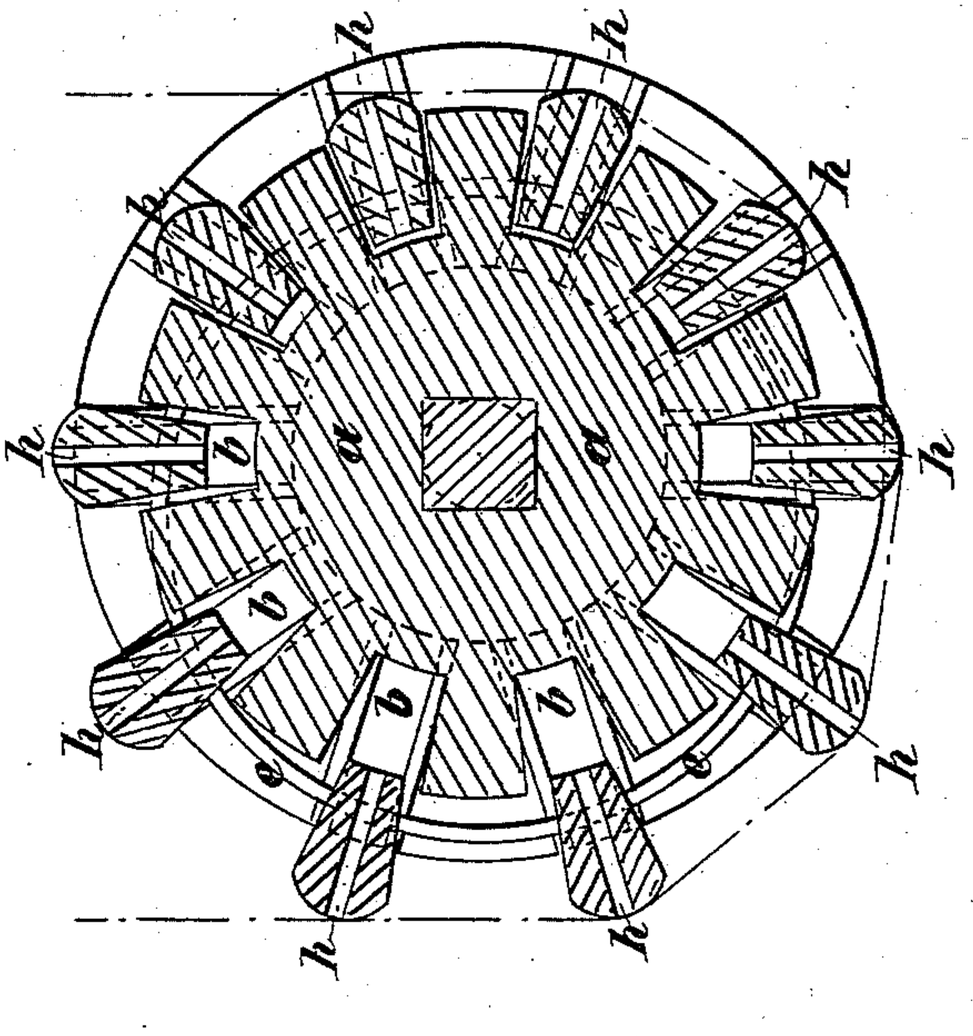
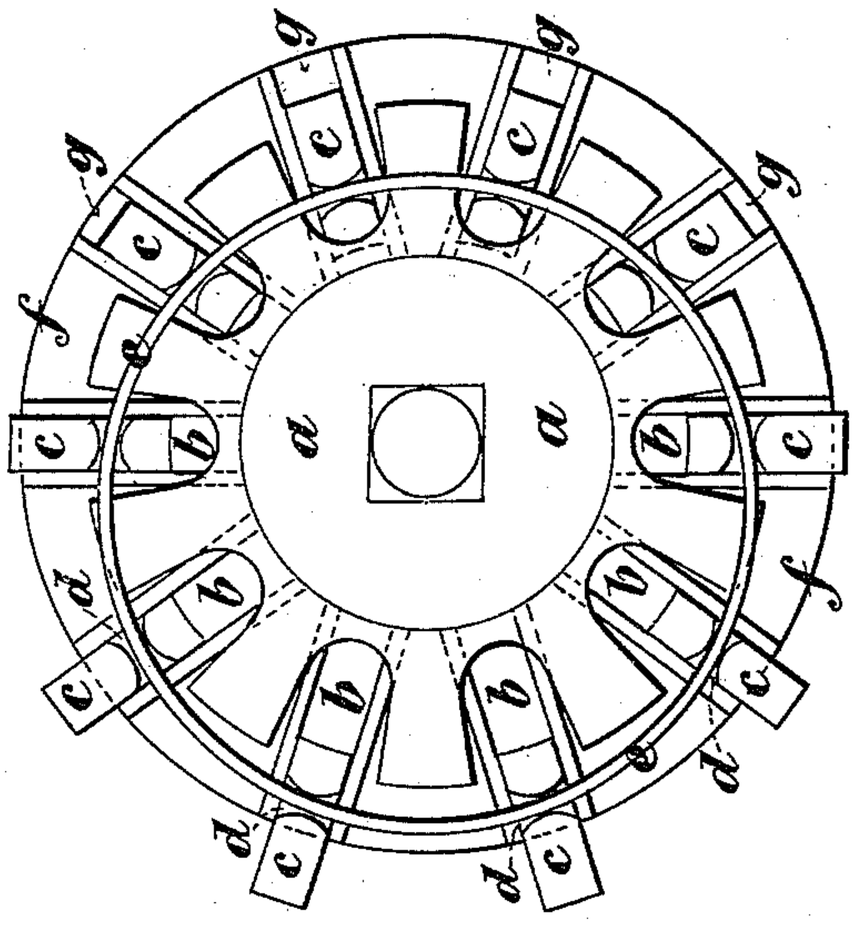


FIG: 4.



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UNITED STATES PATENT OFFICE.

WILLIAM BIRCH, OF LOWER BROUGHTON, MANCHESTER, COUNTY OF LANCASTER, ENGLAND.

ROLLER FOR WASHING OR DYEING MACHINES.

SPECIFICATION forming part of Letters Patent No. 379,442, dated March 13, 1888.

Application filed May 24, 1887. Serial No. 239,205. (No model.) Patented in England February 5, 1887, No. 1,833.

To all whom it may concern:

Be it known that I, WILLIAM BIRCH, a subject of the Queen of Great Britain, and residing at Lower Broughton, Manchester, in the county of Lancaster, England, have invented Improvements in Rollers Used in Washing, Soaping, Dyeing, and other Similar Machines, (for which I have applied for Letters Patent in Great Britain, No. 1,833, dated February 5, 1887,) of which the following is a specification.

The object of my invention is to produce a roller having a cellular surface so formed that when such roller is immersed, either partially or wholly, in any liquid and a woven fabric is passed round it, so as to cause it to revolve, the tension of the fabric will cause the liquid admitted to the cells at one part of its revolution to be forced outward through the fabric as those cells come round to another point in the revolution of the roller.

According to a former invention of mine, for which I obtained Letters Patent in the United States of America, dated June 22, 1886, No. 344,238, I proposed to make the walls of the cells of india-rubber or other collapsible substance; but according to my present invention I obtain the same result in a more efficacious manner, and at the same time I am enabled to employ metal, wood, or other rigid materials which are not injuriously affected by the hot or acid liquors employed.

Such being the nature and object of my said invention, the manner in which the same is to be performed or carried into practical effect will be readily understood on reference to the three annexed sheets of drawings and the following explanation thereof.

Figure 1 is an elevation of one end of a cellular roller constructed according to my invention. Fig. 2 is a transverse section of the same, and Fig. 3 a partial longitudinal section thereof with the end plate removed. Fig. 4 is an end view, also with the end plate removed; and Fig. 5 is an inside view of the said plate. Fig. 6 is a transverse section of a modification, hereinafter described.

For the purposes of my invention I take a roller, of wood or other suitable solid material, *a a*, which may, if preferred, be covered with sheet-copper or other suitable metal or substance, and I form therein a series of external longitudinal grooves or recesses, *b b*, at suitable distances apart—say about one inch, (more or less.) In these grooves or recesses *b b*, I place a series of bars, rods, or strips, *c c*, (either hollow or otherwise,) the ends of which project beyond the ends of the roller *a a*, where they are provided with slots or notches *d d*, into which (at each end) fits loosely a ring, *e e*, of metal, connecting all the bars *c c* together, so as to form a kind of cage.

In Figs. 1, 2, 3, and 4 of the drawings the bars *c c* are shown as oval in form and hollow and having squared solid ends for working in the grooves, hereinafter mentioned. Outside the rings *e e*, at each end, is fixed a metal disk or plate *f f*, Fig. 5, provided with radial grooves *g g*, in which the squared ends of the rods or bars *c c* are guided.

The rings *e e* are of such a diameter that when one bar *c c* is pressed into its groove *b b*, so as to be flush with the surface of the roller *a a*, (or nearly so,) the opposite bar *c c* at the other side of the roller *a a* is forced out by the rings *e e* to its fullest extent, as shown at Figs. 2 and 4, and thus as the roller revolves the longitudinal cells formed by the bars *c c* are alternately closed and opened one after the other, so as to take up the liquor and force it through the cloth.

The long strips *c c*, above described and illustrated, form long parallel spaces or cells from one end of the roller to the other, and if it should be preferred to divide the whole surface into short cells, so as to prevent the liquor from escaping in a lateral direction, the the strips or bars *c c* may be provided with short transverse webs or mid-feathers, (shown dotted at *c′ c′*, Fig. 1,) which work in annular recesses formed in the surface of the roller *a a*, and thus divide the long spaces into a number of short cells. The transverse webs or mid-feathers on each strip or bar are (if employed) preferably so arranged as to come opposite to the center of the space between two similar webs or mid-feathers upon the two strips on each side of it, so as to subdivide the cells alternately from either side.

It will be evident that the strips or bars *c c*

may be made of any thickness or breadth, and, if sufficiently broad, may be perforated, as shown in section at *h h*, Fig. 6, to facilitate the forcing out of the liquor from the spaces or recesses *b b* in which they work, and that they will act, so to speak, as plungers or squirts to force out the liquor from the said spaces or recesses through the fabric as the roller revolves.

I claim as my invention—

1. A roller for washing, soaping, dyeing, and other similar machines, said roller having recesses or cells in its surface and carrying bars adapted to be pressed into the said recesses or cells to force out the liquid through the fabric as the latter passes around the roller.

2. The combination of the roller having recesses or cells in its surface with longitudinal bars, a ring at each end connecting the bars, and guide-plates for the bars, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM BIRCH.

Witnesses:

JNO. HUGHES,

J. E. HUGHES.