J. STEVENS.

Die for Pressing Paper Vessels, &c.

No. 203,670. Patented May 14, 1878.

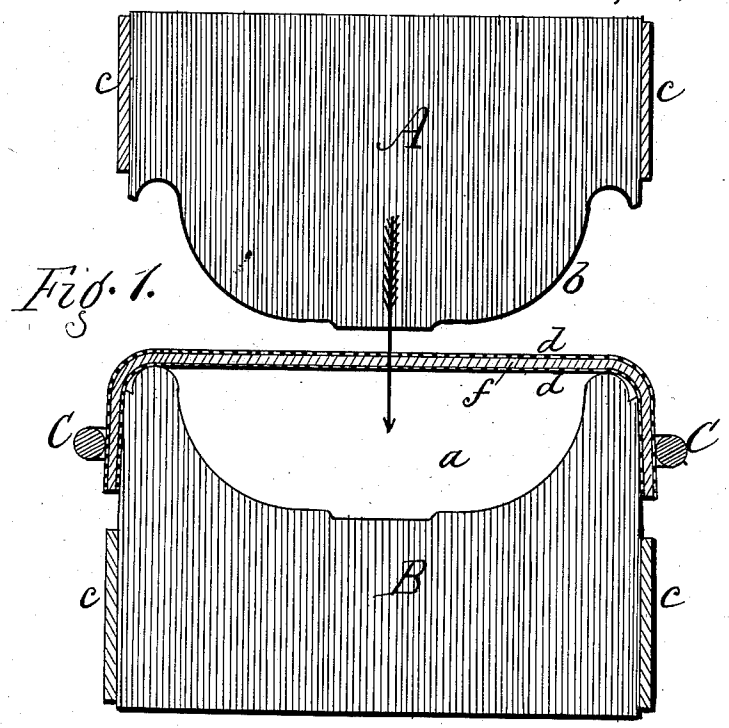



Fig. 1.

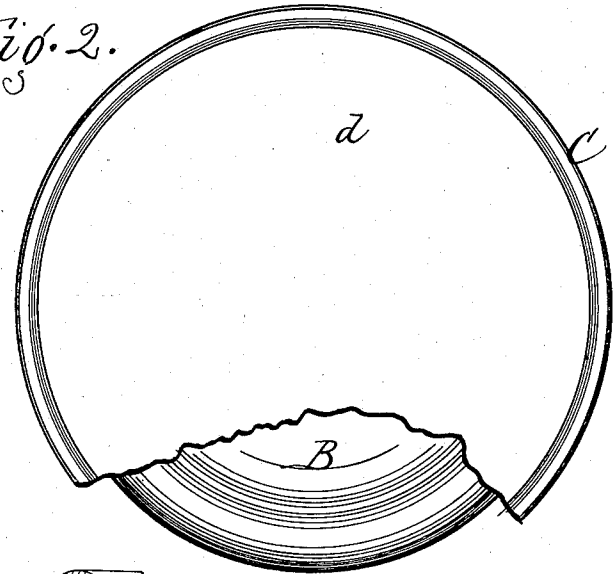



Fig. 2.

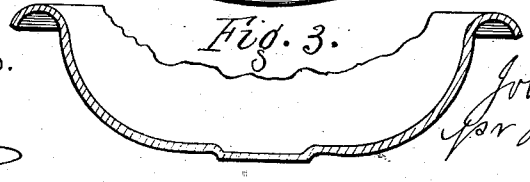


Fig. 3.

Witnesses.
Edwin Scott.
Jacob Spuhr

Inventor.
John Stevens.
per R. F. Osgood,
Atty.

# UNITED STATES PATENT OFFICE.

JOHN STEVENS, OF PORT BYRON, NEW YORK.

## IMPROVEMENT IN DIES FOR PRESSING PAPER VESSELS, &c.

Specification forming part of Letters Patent No. **203,670**, dated May 14, 1878; application filed June 26, 1876.

*To all whom it may concern:*

Be it known that I, JOHN STEVENS, of Port Byron, in the county of Cayuga and State of New York, have invented a certain new and useful Improvement in Dies for Pressing Paper Vessels; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the accompanying drawings, in which—

Figure 1 is a central vertical section, showing the two parts of the die separated, the layers of cloth and pasteboard being laid over the lower half and secured by the ring. Fig. 2 is a plan of the lower half of the die. Fig. 3 is a section of a paper vessel pressed by the die.

My improvement relates to pressing open vessels, such as wash-basins, milk-pans, &c., from pasteboard.

The invention consists in the combination, with a die for pressing the vessels, of covering-sheets of cloth embracing the pasteboard, and a ring securing the said sheets to the lower half of the die, and so arranged that when pressure is applied by the upper half of the die upon the said sheets the ring will allow the sheets to rise, to prevent undue strain and obviate puckering or wrinkling of the pressed pasteboard.

A represents the upper, and B the lower, die. These are made from any suitable wood, but hard wood is preferable, as the closer the grain the better will be the surface of the vessel.

The matrix *a* and form *b* are turned upon the ends of the dies, so as to present the ends of the grains to the pressure. These parts are turned of any desired form, according to the kind of vessel to be produced.

*c c* are strong iron hoops, which encircle the dies and prevent them from splitting or crushing under pressure. *d d* are two layers of cloth, which are placed over the top of the lower die, with the piece *f* of pasteboard between them. These sheets are all made of greater diameter than the die, so that their edges can be turned down around the lower die, as shown. An iron ring, C, is then slipped down over the edges to fasten them in place to the die. To make the ring tighten, the top of the die should be very slightly beveling. When thus attached the sheets are straightened over the top of the lower die, as shown in Fig. 1.

The upper die is now brought down with force, and the three sheets of paper and cloth are forced down into the matrix and heavily compressed.

The pasteboard is used from the wet sheet as produced by the paper-machine before being calendered, in which condition it stretches considerably. As the follower goes down, the edges of the sheets embraced by the ring will rise to a certain extent under the tension, carrying the ring with them; but the resistance is always sufficient to keep the sheets taut under the pressure. The object of this is to prevent wrinkling or puckering, either inside the matrix or over the edge or bead which forms the groove in the outer rim of the vessel. All the wrinkling and puckering will occur below the bead, near the contact of the ring, the tension of the ring keeping the edges straight at all times.

In use the dies are kept wet. The sheets of cloth and pasteboard are also wet. Under the heavy pressure necessary to form the vessel the water will pass through the pores of the wood, following the grain. This I have demonstrated by a large manufacture of the vessels, the water under pressure passing up in a sheet through the top of the die and running off. The finer-grained hard woods I have found best for the purpose.

Another advantage of this invention is that a finer surface is produced upon the vessel than can be produced by iron forms, the latter having to be grooved or cut with water-channels to allow escape of water, and then covered with wire-gauze to receive the pulp. The fine close grain of the wood covers the whole surface and leaves no irregularities.

The above describes single-acting dies. Compound-acting dies for pressing the bottom and sides of vessels may be arranged for use without difficulty.

What I claim herein as new is—

The combination of the die B, the sheets *d d*, and the ring C, the said sheets inclosing

the pasteboard betweem them and resting over the edges of the lower half of the die, and being held loosely thereto by the ring, the whole arranged as described, so that as pressure is applied by the upper half of the die the ring will produce sufficient tension upon the sheets to prevent puckering or wrinkling, but will relax sufficiently to prevent strain or tearing, as herein specified.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

JOHN STEVENS.

Witnesses:
R. F. OSGOOD,
EDWIN SCOTT.