No. 739,087. PATENTED SEPT. 15, 1903.

E. M. KNIGHT.

MOLD FOR MAKING FILTER PADS.

APPLICATION FILED APR. 29, 1903.

NO MODEL.

Fig. 1.

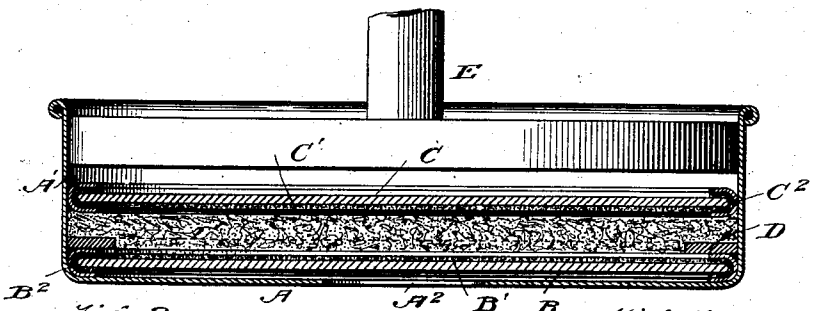


Fig. 2. Fig. 3.

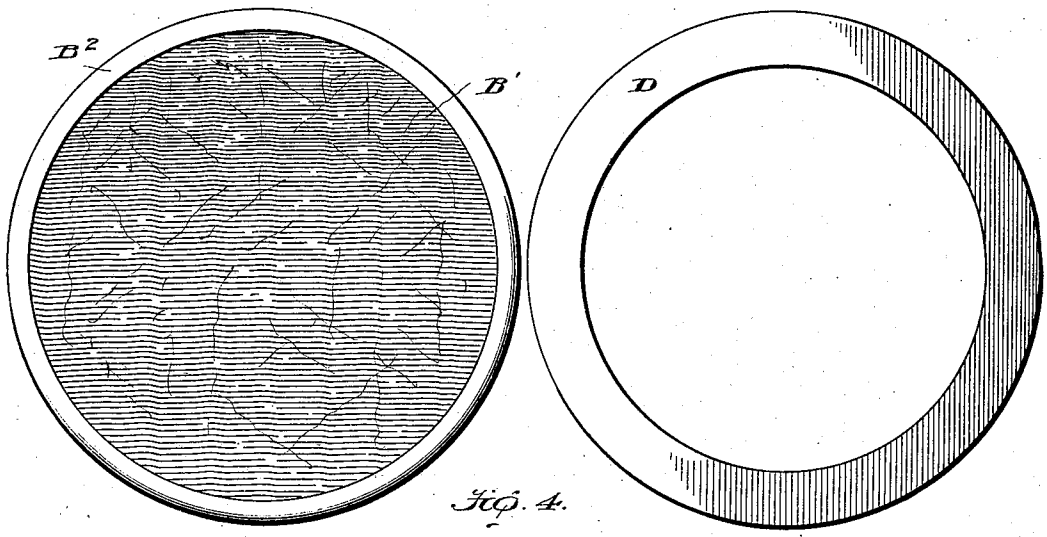


Fig. 4.

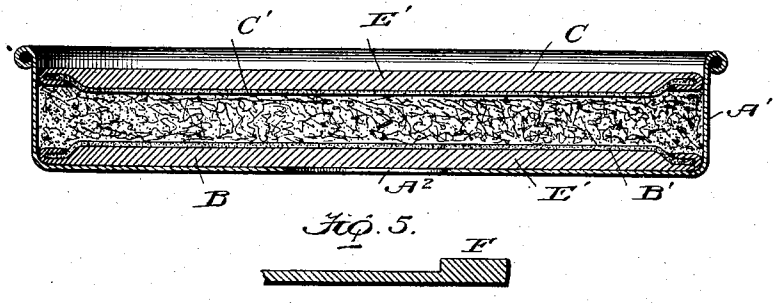


Fig. 5.

Witnesses

[illegible]

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by T. Walter Fowler,

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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 739,087. Patented September 15, 1903.

UNITED STATES PATENT OFFICE.

EDWARD MARTIN KNIGHT, OF BROOKLYN, NEW YORK, ASSIGNOR OF ONE-HALF TO R. H. MARTIN, OF NEW YORK, N. Y.

MOLD FOR MAKING FILTER-PADS.

SPECIFICATION forming part of Letters Patent No. 739,087, dated September 15, 1903.

Application filed April 29, 1903. Serial No. 154,779. (No model.)

To all whom it may concern:

Be it known that I, EDWARD MARTIN KNIGHT, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented new and useful Improvements in Molds for Making Filter-Pads, of which the following is a specification.

This invention relates to certain new and useful improvements in devices for making pads or diaphragms of fibrous material for separating sedimentary matter from water designed for drinking and domestic purposes; and the invention consists, essentially, of a mold comprising a holder and opposing fabric-surfaced dies, between which the pad is formed.

The invention also consists of a pair of dies and a spacing ring or member surrounding the edge of one of the dies and adapted to reduce the space between the outer edge portions of the pair of dies when one of said dies is forced toward the other to compress the mass of fibrous material placed between them, as I will presently describe.

The invention further consists of the parts and the constructions and combinations of parts, which I will hereinafter describe and claim.

In the accompanying drawings, forming part of this specification and in which similar letters of reference indicate like parts, Figure 1 is a vertical sectional view of a mold embodying my invention. Fig. 2 is a plan view of one of the dies. Fig. 3 is a plan view of the spacing-ring. Fig. 4 is a sectional view of a mold of modified form. Fig. 5 is a modification to be referred to.

The object of my invention is to form the filter-pad of fibrous material, such as asbestos, and to form the said pad with one portion more compact or dense than the remaining portion, said dense portion being, however, sufficiently porous to permit the percolation of water through it, during which percolation the water is relieved of its sedimentary or suspended particles. In the performance of this object I employ a mold in which the pad is formed from the loose fibers and therein compacted to the proper density for effective filtration purposes. This mold may be of a varied character, and its size and interior shape will depend upon the size and form of the desired pad.

In Fig. 1 the mold is shown of circular form and comprises a holder A with deep surrounding flange A′ and a central opening A^2 in its bottom to facilitate the removal of the hereinafter-described dies and the finished or compressed pad. In the bottom of the holder A, I place the lower die B, whose diameter approximates that of the holder, said die consisting, preferably, of a metal disk or plate, over the upper surface of which is stretched a piece of fabric B′, whose edge is turned over the disk or plate and appropriately secured by a binding-strip B^2. In connection with this lower die I use an upper or companion die C of like construction, over the under part or face of which is the fabric surface C′, secured by a surrounding binding-strip C^2. In addition to the foregoing I employ a loose flat ring D, whose outer diameter is about equal to the diameter of the dies and whose inner diameter is about equal to the diameter of that portion of the pad which might be considered the active portion exposed to the direct action of the water to be filtered. This ring is laid upon the lower die and fibers of asbestos or other suitable material which have been carded or combed and are placed within the holder on top of the ring and lower die. A sufficient mass (determined, for instance, by weighing) is placed within the holder and lies upon the fabric-covered surface of the lower die, which surface has been previously moistened to prevent the fibers adhering to it. Then the upper die, whose fabric surface has also been moistened, is placed upon the mass of loose fibers, and pressure is applied to said upper die by a plunger E or other pressure device which may represent a member of a suitable press, and the mass of fibers is compressed to the desired degree between the opposing faces of the dies. The ring D serves to space the distance between the peripheral portions of the dies, and when the aforesaid pressure is applied to the upper die the mass of fibers is forced into the space represented by the open center of the ring

and reduced in thickness and compressed; but as the ring projects above the plane of the face of the lower die it will be apparent that the portion of fibers which overlie the ring will be subjected to a greater pressure, and therefore made more dense and compact than the fibers which occupy the space in and above the open center of the ring. The result is, therefore, that the central portion of the pad is left less dense and compact than the edge portion, and this less dense portion or part subjected to less pressure adjacent to the edge portion subjected to greater pressure may then be bent over the sharp angles of a filter-frame without danger of rupturing the pad and opening up crevices for the passage of unfiltered water.

In some instances it is desirable to compress the central portion of the pad to a greater degree than the edge portion, as disclosed in my application, Serial No. 146,123, filed March 4, 1903, and when this is desired the loose ring is omitted and the central portion of both dies are thickened, as at E', thereby forming surrounding edge portions of reduced thickness. In this case, as the central portions of the dies are thicker than the edge portions and stand beyond the plane of the latter, it will be manifest that when the pressure is applied, as aforesaid, said thickened central portion will sink more deeply into the mass of fibers and will consequently more firmly compress the central portion of the mass of fibers than the edges, as the latter will occupy the greater space formed by the thinner edge portions of the dies and will accordingly be subjected to but little compression, so that the fibers may be left substantially loose. In either of the above instances the finished pad will show a decided bead at the junction of the compressed central portion with the less compressed and soft and pliable edge portion, which enables the latter to be turned or bent at one or more substantially sharp angles to the more solid central portion, as when putting the pad into a filter-frame and bending the soft edge to form a water-tight joint with said frame.

When the pad has been compressed, as before described, the dies and pad are removed from the holder by pushing the finger or a tool through the hole in the bottom of the holder, and thus lifting the dies and pad, and said dies are then removed from the pad, their moistened surfaces having prevented the fibers sticking to the fabric of the dies. The pads are then packed in boxes or packages ready for use in filter-frame of suitable size and form.

If desired, the ring may be made rigid with one of the dies, as shown at F in Fig. 5, without departing from the spirit of my invention.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a device of the character described, the combination with a holder adapted to receive fibrous material, of upper and lower dies between which the material is compressed, said lower die having a facing of moisture-retaining material.

2. In a device of the character described, the combination with a holder adapted to receive fibrous material, of upper and lower dies between which the material is compressed said upper die having a facing of moisture-retaining material.

3. In a device of the character described, the combination with a holder adapted to receive fibrous material, of upper and lower dies between which the material is compressed said dies having a facing of moisture-retaining material.

4. In a device of the character described, the combination with a holder adapted to receive fibrous material, of opposing flat-faced dies loosely placed within the holder and between which the material is compressed, and means proportioning the pressure upon said material whereby one portion of the mass of material is compressed to a greater degree than the remaining portion.

5. In a device of the character described, the combination of a holder adapted to receive fibrous material; opposing dies between which said material is compressed; and means upon one of said dies and extending beyond the plane of the face thereof for subjecting one portion of the material to greater pressure than the remaining portion.

6. In a device of the character described, the combination of a holder adapted to receive a mass of loose fibers; a removable die in said holder; a ring surrounding the periphery of the die, upon which ring and die the fibers lie; and a second die opposing the first-named one said dies having a fabric covering over their opposing faces.

7. In a device of the character described, the combination of a holder and upper and lower dies one of said dies seated in the bottom of the holder said holder having an opening in its bottom to facilitate the removal of the dies.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

EDWARD MARTIN KNIGHT.

Witnesses:
H. D. JAMESON,
A. NORTH.