

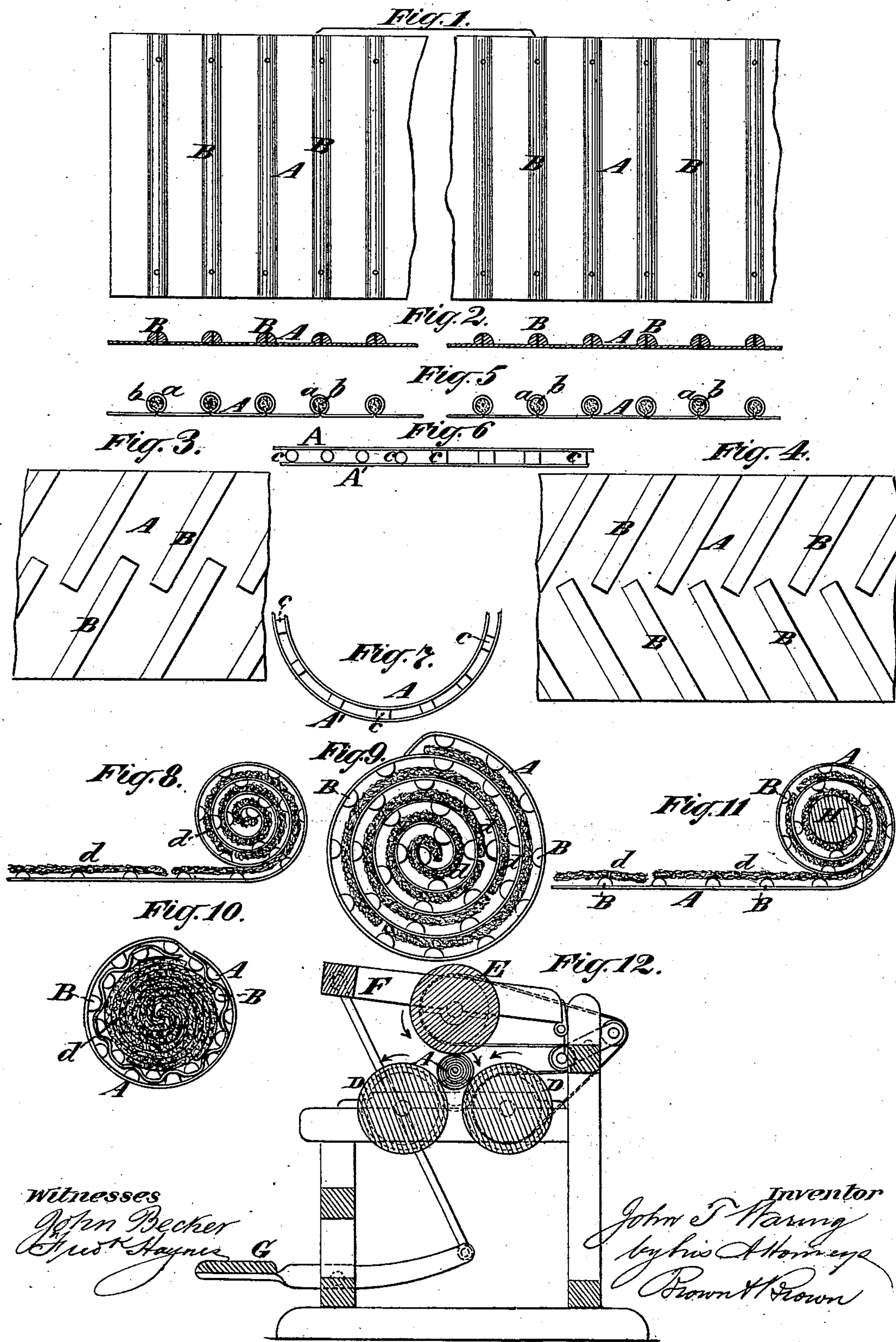
(No Model.)

J. T. WARING.

Apparatus for Felting Hat Bodies.

No. 227,331.

Patented May 4, 1880.



UNITED STATES PATENT OFFICE.

JOHN T. WARING, OF BOSTON, MASSACHUSETTS.

APPARATUS FOR FELTING HAT-BODIES.

SPECIFICATION forming part of Letters Patent No. 227,331, dated May 4, 1880.

Application filed March 17, 1880. (No model.)

To all whom it may concern:

Be it known that I, JOHN T. WARING, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and
5 useful Improvements in Apparatus for Felting Hat-Bodies and other Articles, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates, first, to what are
10 known in hat-manufacturing as "sizing-cloths," in which the hat-bodies are, and other felt goods may be, subjected to the operation known as "sizing" or "planking," by which they are or may be shrunk to the requisite size
15 and worked to the requisite degree of compactness and tenacity. Such cloths consist, generally, of a piece of ordinary even-surfaced woven fabric, such as burlap.

My improvement in such cloths consists in a
20 sizing-cloth constructed, provided, or furnished with slats, ribs, ridges, bosses, or projections, constructed with some parts thicker, harder, or more solid than others, or otherwise having
25 an uneven or irregular surface, for the purpose of producing a more effectual "working" of the hat-bodies or other goods in the rolling operation to which they are subjected in such cloths.

The hat-bodies or other articles to be felted,
30 when rolled in the ordinary even-surfaced cloth, are apt to be so closely confined as to prevent that working of their component fibers on, with or into, and between each other which is requisite for perfect felting; but, by reason of
35 the projections or uneven face or body of my improved cloth, the goods have room provided for them between the thicker, harder, or more solid portions of the said cloth to enable them to be properly worked, and the said projec-
40 tions, or thicker, harder, or more solid portions, will work upon the goods between them, and so work them more effectually.

This improved cloth may be used in sizing
45 or planking by hand, or in a sizing or planking machine.

Another improvement consists in the combination, with a sizing-cloth, of a heavy weight,
50 preferably in the form of a roller, to be rolled up into the hat-body or other article, or the roll of hat-bodies or other articles rolled up within such cloth, for the purpose of produc-

ing automatically on the said body, bodies, or other articles a pressure outward from the interior thereof. This weight may be attached to one end of the sizing-cloth or be left de-
55 tached therefrom, and it may be used in combination with various machines by which the rolling or planking operation may be performed.

Figure 1 is a face view of one example of
60 my improved sizing-cloth. Fig. 2 is a longitudinal section of the same. Figs. 3 and 4 are face views of two modifications of the same. Figs. 5, 6, and 7 are longitudinal sections of other modifications of the same. Figs. 8, 9, 65
and 10 are sectional views illustrating methods of rolling up hat-bodies in such cloths. Fig. 11 exhibits a section of such a cloth having the weight above mentioned attached to one end, showing it partly rolled up with hat-
70 bodies inside.

In the example shown in Figs 1 and 2 the sizing-cloth consists of a piece of burlap or other woven fabric, A, which has an uneven surface produced by having secured to its face,
75 by rivets or otherwise, a series of slats or ribs, B B, of wood or other material, the said slats or ribs being arranged transversely at right angles to the length of the cloth.

The cloth represented in Figs. 3 and 4 is
80 composed of a single cloth, A, with a series of oblique ribs or projections, B, on its face, producing its uneven surface. The ribs or projections thus arranged must, in order to enable them to be rolled up, be of some flexible
85 material, as india-rubber, and such cloths, with such ribs or projections, might be made wholly of vulcanized india-rubber in one piece.

The cloth A (represented in Fig. 5) has an uneven surface produced by forming in it a
90 series of tucks or pockets, *a a*, into which are inserted fillings *b*, of fibrous cord or other material.

The cloth represented in Fig. 6 is double,
95 being composed of two cloths, A A', of burlap or other woven fabric, having inserted and secured between them, by rivets, nails, or other means, slats, ribs, or rods *c c*, of wood or other material, of square, round, or other form.

The cloth represented in Fig. 7 is like that
100 shown in Fig. 6, except that the inner cloth, A, is made shorter than the outer one, A',

so that in the double internally slatted or ribbed cloth thus formed the two cloths may be nearly equally tight. These slats, ribs, or rods *c c* give these cloths uneven surfaces.

5 Another modification of the cloth would consist in providing its surface with a series of bosses, knobs, buttons, or nodules of wood, bone, india-rubber, or other material, or with knots of cord or other material, such bosses,
10 knobs, nodules, buttons, or knots to be secured to the cloth by riveting, sewing, or other convenient means.

Instead of a woven fabric with projections formed on its face in any of the ways above
15 described, a cloth may be made of strings or light cords arranged parallel and lengthwise, like the warp of a woven fabric, and stouter cords or pieces of rope arranged transversely to the said strings or lighter cords, as the rods,
20 ribs, or slats *B B* and *c c* are arranged relatively to the cloths *A* and *A'*.

The hat-bodies or other articles to be felted (indicated by *d d*) may be dipped in water or other liquid or solution used in felting and
25 rolled up in these cloths, either spread out singly, as shown in Figs. 8 and 9, or a number all together within the inner end of the cloth, as shown in Fig. 10. I propose, generally, to
30 operate in such a cloth upon about four hat-bodies at a time.

When the hat-bodies are rolled up in the cloth the sizing or felting operation may be performed by rolling and working the roll composed of the cloth and the bodies in the
35 same way in which the sizing is generally performed by hand or in the sizing-machines in common use. A suitable machine for the purpose is that illustrated in Fig. 12, which is well known, the principal working parts of
40 which are three rollers, *D D E*, rotating in the same direction, the two lower rollers, *D D*, having their journals in fixed bearings, and the upper one, *E*, which is a pressure-roller, having its journals in a frame, *F*, to which
45 pressure is applied by a treadle, *G*.

H in Fig. 11 is the weight combined with

the sizing-cloth for producing automatically, on a roll of hat-bodies or other goods rolled up into said cloth, a pressure outward from the interior thereof as the said roll is worked
50 in the usual process of sizing. This weight is in the form of a cylinder or roller of a length equal to the width of the cloth, say about eighteen inches, and of an external diameter about one and a half inch. I have success-
55 fully used for this weight a piece of lead pipe of the above dimensions which weighs about eighteen pounds. This weight should, for convenience, be permanently attached to one end of the sizing-cloth, so that it may be easily
60 rolled up into the middle of the roll of hat-bodies or other articles rolled up into the said cloth. The weight may, however, be left detached from the cloth and have the hat-bodies or other articles rolled up on it as they are
65 rolled up into the cloth.

A weight of this kind may be used in combination with a sizing-cloth of the ordinary kind with good effect, though I prefer to use it in combination with my improved sizing-
70 cloth.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. A sizing-cloth for felting hat-bodies or other articles having an uneven or irregular
75 raised surface, substantially as and for the purpose herein described.

2. The combination, with a sizing-cloth for felting hat-bodies or other goods, of a weight, *H*, adapted to be contained within a roll of
80 articles to be sized or felted in such cloth and to produce automatically therein a pressure outward from the interior thereof, substantially as and for the purpose herein described.

3. The combination, with a sizing-cloth, of
85 an attached weight, *H*, substantially as and for the purpose herein specified.

JOHN T. WARING.

Witnesses:

FREDK. HAYNES,
A. C. WEBB.