

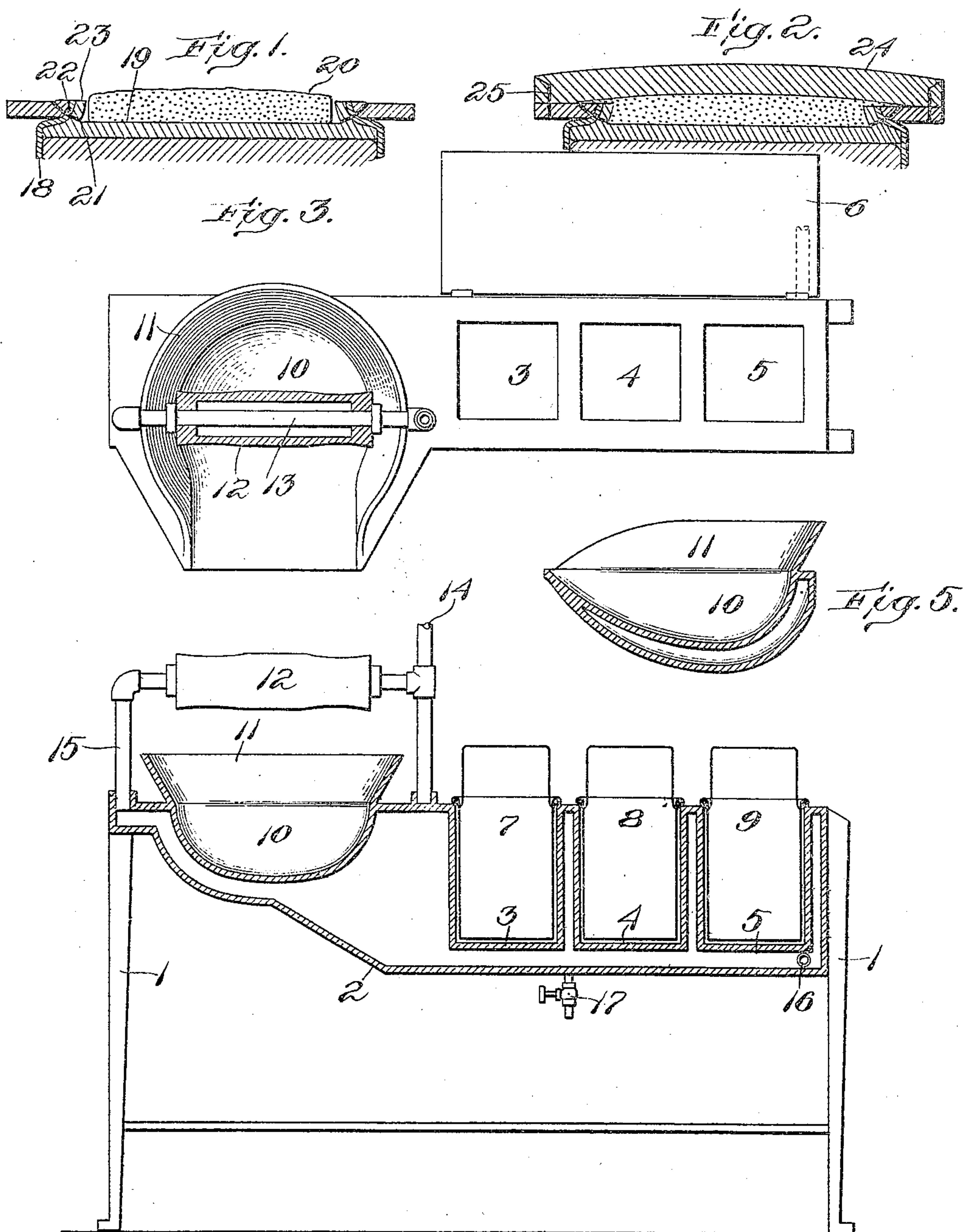
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PATENTED DEC. 26, 1905.

A. THOMA.

ART OF FILLING SHOES.

APPLICATION FILED AUG. 28, 1905.



Witnesses:
Arthur F. Randall,
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Fig. 4. Inventor: *Andrew Thoma,*
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UNITED STATES PATENT OFFICE.

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ART OF FILLING SHOES.

No. 808,224.

Specification of Letters Patent.

Patented Dec. 26, 1905.

Application filed August 28, 1905. Serial No. 276,001.

To all whom it may concern:

Be it known that I, ANDREW THOMA, a citizen of the United States, residing at Cambridge, in the county of Suffolk and State of Massachusetts, have invented an Improvement in the Art of Filling Shoes, of which the following description, in connection with the accompanying drawings, is a specification, like figures on the drawings representing like parts.

In the manufacture of what are known as "Goodyear-welt" shoes and "McKay-welt" shoes there is commonly a cavity on the inside of the outer sole filled in with so-called "filler," which is essential to give the proper solidity and even-wearing qualities, &c., to the shoe. The usual kinds of filler and the manner of use are set forth in United States Patent No. 458,421, dated August 25, 1891; and my invention relates to improving a shoe in these particulars.

The filler commonly used heretofore has consisted of ground cork or leather mixed, as stated in the above patent, with naphtha-rubber cement, and on account of the evaporation of the naphtha the filler is apt to break down, leaving cavities and depressions, and in time becomes brittle and granular, so that under the constant flexure of walking it becomes a dry powder, working through the crevices of the shoe, more or less, to the annoyance of the wearer, and also, because of the exceedingly wet and viscous condition of the filler when applied, the operator finds it difficult to spread it properly into the corners, &c. Also this filler is exceedingly slow in drying, and in humid weather it is practically impossible to cause it to dry and set in the time required, so that when the shoe is applied to the leveler this unset filler is apt to bunch up under the toe, consequently causing the quick wearing away of the sole at that point or else rendering the interior bottom of the shoe uneven to the foot of the wearer. Accordingly I aim to cure the above disadvantages, while at the same time retaining the cementitious form of comminuted filler mass which the trade requires. Beside providing a filler which will not evaporate or cave in and which will not cling to the tool and remain moist and refuse to set indefinitely, I have succeeded in devising a method which makes the shoe absolutely waterproof, gives it a high degree of pliability and elasticity or

resiliency of tread, while at the same time securing the main advantages of quick setting, (so that the outer sole may be applied immediately and the manufacture of the shoe continued without delay,) perfect adhesion to the leather even though the latter may be damp, economy, uniformity, and neatness.

Further details of my invention will be pointed out more at length in the course of the following description, and for convenience and clearness of understanding I have illustrated in the accompanying drawings the various procedures and apparatus employed in carrying out my method.

In the drawings, Figures 1 and 2 are cross-sectional views showing, respectively, a shoe partially and fully made according to the herein-described invention. Figs. 3 and 4 are respectively views in top plan and vertical section of the Arnold machine which has been invented for carrying out my method commercially, and Fig. 5 is a vertical sectional detail of the dip-pot.

In carrying out my method I first prepare a filler of any suitable materials which will be permanently pliable, will not evaporate, will adhere firmly and permanently to leather or the like, and be semisolid when cold and freely plastic or semifluid when properly heated and will be quick setting, such a compound being formed of a mixture of comminuted cork, gutta-percha, resin, and paraffin-oil, (about five parts of the gutta-percha to three of the resin and two of the oil,) and when these are thoroughly mixed under heat the resulting filler may be permitted to stand indefinitely. I then provide a suitable machine or mechanism—such, for instance, as shown in the drawings, where on suitable standards 1 is mounted a steam-jacketed top 2, comprising a series of chambers 3 4 5, adapted to be closed by a cover 6 and containing-pails 7 8 9, and at the left thereof is a dip-pot 10, surrounding which is a drip-guard 11, and above said pot is a roll 12, maintained uniformly hot by the passage of steam through a pipe 13, which constitutes the axial bearing therefor, said steam entering at 14 and thence passing through the pipes 13 and downwardly at 15 to the jacketed top 2 and out at 16, a drip-pipe being shown at 17. Having provided the mechanism and filler as above explained, I fill the pails 7, 8, and 9 with filler and then turn on the steam, which results in slowly

melting the filler until it becomes liquid or sluggishly fluid, whereupon the pail 7 is emptied into the dip-pot 10 and replenished. An operator takes the shoe 18 whose cavity 19 is
 5 to be filled and then with any suitable means lifts from the hot mass of filler in the dip-pot 10 the proper quantity of filler to spread into the cavity 19, as indicated at 20. Thereupon the operator instantly presses the body of
 10 filler 20 forcibly against the hot roll 12, the result being that the outer surface of the filler is superheated by contact with said hot roll, and the viscous binder of the sluggish filler is immediately caused to flow laterally into
 15 the corners 21 of the cavity and into the sewing 22 and is spread laterally to form tight joints 23. By the same action the top surface of the filler, where the chunks of cork lie turned up unevenly, is compressed and rendered perfectly smooth and level, and at the
 20 same time the vertical pressure not only spreads the filler into the crevices, needle-holes, &c., (which is due mainly to the heat as well as to the pressure,) but the filler is likewise caused
 25 to thereby to adhere permanently and tenaciously to the bottom and sides of the cavity. Thereupon the shoe is removed and the filler immediately sets (without requiring the usual hours for this purpose) and the shoe proceeds at once in its further manufacture.
 30 The outer sole 24 is thereupon secured by the stitches 25 in the usual manner and leveled down to shape, thereby being stuck to the filler throughout its width, being supported
 35 at its middle part by the resilient and permanently pliable waterproof filler. A shoe constructed in this manner possesses permanent solidity and even-wearing qualities, a high degree of resiliency and pliability, is not
 40 merely transiently waterproof, as in the case of the old construction, but is permanently so, and is equally light, less expensive, more expeditiously made, and the construction being performed under heat gives a homogeneous
 45 character to the parts, which are all bound together by the filler when subjected to pressure under heat, as explained.

Besides the above advantages, my invention affords decided advantages in the factory, inasmuch as there is no danger from fire, (a serious matter in the case of the naphtha-cement,) there is no loss or deterioration from evaporation or the like, the filler when stored for use cannot smear or run over the floor or adjacent
 50 articles, and it does not require to be made on the spot, but can be prepared long beforehand in large quantities.

I wish it understood that I am not limited to the mechanical details in any way as herein shown, and that the ingredients of my filler may be varied, (I have several fillers meeting the requirements of my method,) and that the filler and other details herein shown and described are covered in other applications, the
 60 present application being limited to the art

or method forming part of my new system of shoe manufacture.

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

1. In the herein-described art, providing a filler composed of comminuted filler material held compactly together in a semisolid mass by a permanently flexible, viscous binder, capable of liquefying under heat, slowly heating said mass until sluggishly fluid, applying the heated filler to the shoe to be filled, and subjecting the same to vertical pressure while still hot.

2. In the herein-described art, providing a filler composed of comminuted, resilient filler material held compactly together in a semisolid mass by a permanently flexible, viscous binder capable of liquefying under heat, slowly heating said mass until sluggishly fluid, applying the heated filler to the shoe to be filled so as to leave the applied mass projecting above the cavity to be filled, and subjecting the same to vertical pressure while still hot.

3. The herein-described art, consisting of providing a permanently flexible, normally semisolid filler containing a comminuted body and a viscous binder capable of liquefying under heat, heating said filler, depositing the heated filler in the cavity to be filled, superheating the outer surface of said deposited filler while the latter is still hot, and simultaneously applying a vertical pressure thereto.

4. The herein-described art, consisting of providing a permanently flexible, resilient, normally semisolid filler containing a comminuted body and a viscous binder capable of liquefying under heat, heating said filler, depositing the heated filler in the cavity of the inner sole, superheating the outer surface of said deposited filler while the latter is still hot, simultaneously applying a vertical pressure thereto but leaving the compressed filler projecting above the welt and inner sole, and then applying and securing the outer sole on the filler and subjecting the same to external pressure for maintaining the resilient filler compressed.

5. The herein-described art, consisting of providing a filler composed of comminuted filler material held compactly together in a semisolid mass by a permanently flexible, viscous binder capable of liquefying under heat, slowly heating said mass until sluggishly fluid, applying the heated filler to the shoe to be filled, and subjecting the same momentarily to the vertical pressure of a hot pressing-tool.

6. The herein-described art, consisting of providing a filler composed of comminuted filler material held compactly together in a semisolid mass by a permanently flexible, viscous binder capable of liquefying under heat, slowly heating said mass until sluggishly fluid, applying the heated filler to the shoe to

be filled, and subjecting the same to the pressure of a hot tool moved quickly over the top surface thereof.

7. The herein-described art, consisting of
5 providing a filler composed of comminuted filler material held compactly together in a semisolid mass by a permanently flexible, viscous binder capable of liquefying under heat, applying said filler hot to the shoe-cavity,
10 and then subjecting said filler simultaneously to vertical pressure and external heat for supersoftening the outer layer of filler, evening, smoothing and compacting the filler granules, and sticking the bottom layer of the filler
15 more forcibly to the shoe.

8. In the herein-described art of shoe manufacture, providing a filler composed of com-

minuted filler material held compactly together in a semisolid mass by a waterproof binder capable of liquefying under heat, filling 20 the shoe-cavity with said filler, and then applying a sudden and strong heat to said filler for liquefying a portion of its waterproof binder, and applying external pressure to the filler for forcing said binder into the joints 25 and stitches about said cavity.

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

ANDREW THOMA.

Witnesses:

GEO. H. MAXWELL,
M. A. JONES.