Sept. 2, 1924. 1,507,303

S. K. APPLEBAUM

SUPPOSITORY MAKING MACHINE

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Fig. 1.

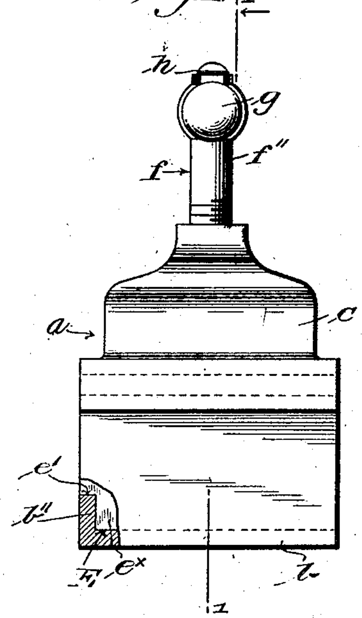
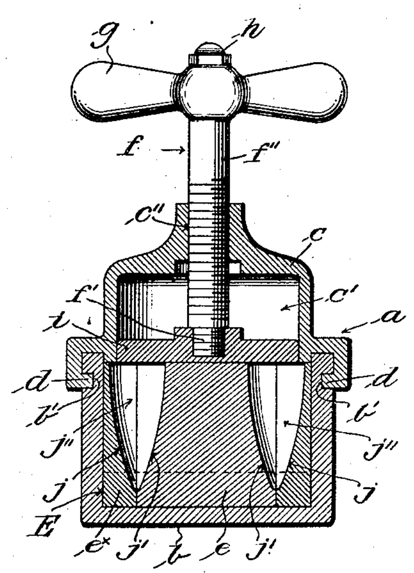


Fig. 2.



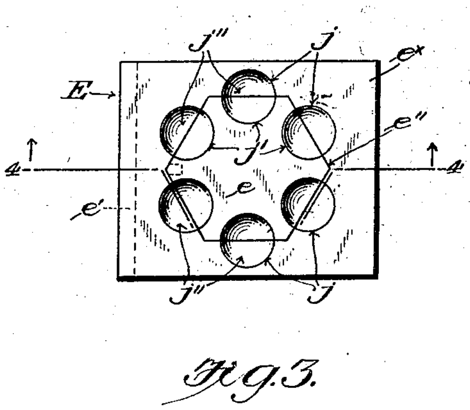


Fig. 3.

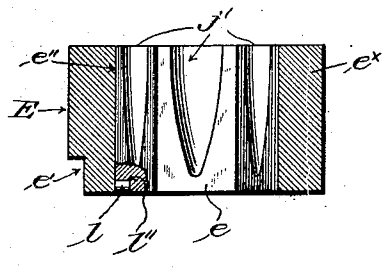


Fig. 4.

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Fig. 5.

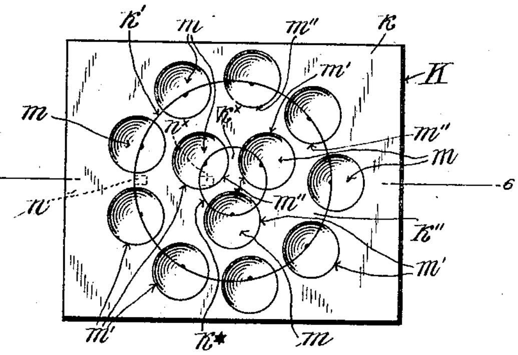


Fig. 6.

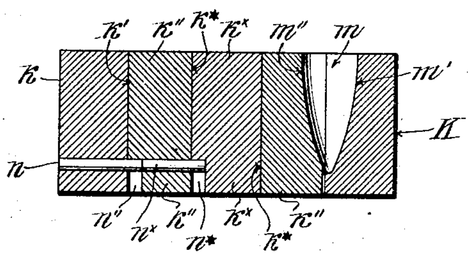
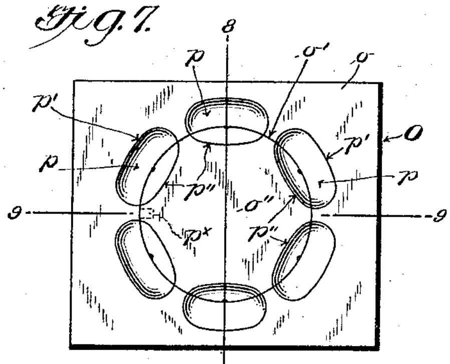


Fig. 7.



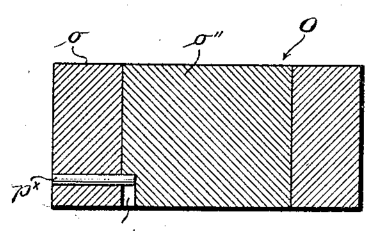


Fig. 9.

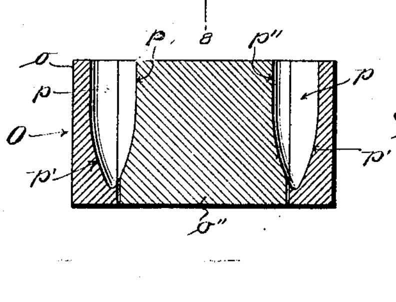


Fig. 8.

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Patented Sept. 2, 1924. **1,507,303**

UNITED STATES PATENT OFFICE.

SAMUEL K. APPLEBAUM, OF NEW YORK, N. Y.

SUPPOSITORY-MAKING MACHINE.

Application filed May 5, 1923. Serial No. 637,003.

To all whom it may concern:

Be it known that I, SAMUEL K. APPLEBAUM, a citizen of the United States of America, residing at the borough of Richmond, in the city of New York, county of Richmond, and State of New York, have invented certain new and useful Improvements in Suppository-Making Machines, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to improvements in apparatus by means of which suppositories and like medicaments are molded and particularly to improvements in the parts of such machines that are immediately involved in the molding operation. It has been a common practice for pharmacists, drug-clerks and others who are called upon in the ordinary pursuit of their calling to prepare suppositories and like healing articles of manufacture, to make them by hand; but that process is slow and therefore costly. Moreover, the product is not uniform in either composition, size or weight. The cost of hand-made suppositories is further enhanced by the loss due to breakage. An object of this invention is to provide a machine of the kind hereinbefore referred to which will be simple in construction, comparatively inexpensive in manufacture and efficient in operation and use. Another object of this invention lies in the provision of a suppository-making contrivance whereby the loss due to breakage of the product will be reduced to a minimum and the cost of the finished articles will be lessened greatly as compared with processes heretofore in use. Other features of this invention will appear as the following description progresses.

In the drawings illustrating the principle of this invention and the best mode now known to me of applying that principle, Fig. 1 is an elevation of the machine assembled; Fig. 2 is a central vertical section on the line 1—1, of Fig. 1; Fig. 3 is a plan view of the removable two-part mold or die-block and Fig. 4 is a vertical section thereof on the line 4—4, of Fig. 3; Fig. 5 is a plan view of another form of mold or die-block and Fig. 6 is a vertical section thereof on the line 6—6, of Fig. 5; Fig. 7 is a plan view of still another form of mold or die-block and Figs. 8 and 9 are vertical sections thereof on the lines 8—8 and 9—9, of Fig. 7.

The frame or body a of the apparatus is in the nature of a housing, of which the base b is U-shaped and is open at its top and ends, while the top-portion c of the housing serves as a cover and is formed with a cylindrical chamber c' (Fig. 2). The lower or bottom part of the top c is of a rectangular shape and is formed at its sides with a pair of inwardly-projecting guide-ribs d, d, which are adapted and designed to engage in the guide-grooves b', b', of the sides of the base, when the machine is assembled; in this way, the parts b, c, of the body of the apparatus are slidably engaged with each other and may be readily disengaged from each other by merely sliding the top c from off the base b. A shoulder b'' formed within the base b at one of its ends serves as an abutment and prevents the mold or die-block E from being thrust too far, when being inserted in the base b and so acts to position the mold E, which is cut away and formed thereby at e' with a notch within which the abutment b'' is received.

In the top of the cover c, there is formed an internally-threaded opening or passage c'' which engages the screw-threads of a feed-screw or plunger f, the inner end f' of which is reduced and threaded and the upper end f'' of which carries a handle or finger-hold g that is held in place by means of a locking-nut h (Fig. 2). Within the chamber or barrel c' of the cover c, there is mounted a piston or presser-foot i, which is circular in shape and is screwed on the reduced end f' of the feed-screw or plunger f.

The mold or die-block E is two-part, the outer part $e^{\times}$ being formed with a centrally-disposed opening e'' the wall of which is provided with a series of recesses j. Within the opening e'', there fits snugly and slidably the other part e of the mold E; and, in the particular embodiment of this invention illustrated in Figs. 3 and 4, the part e is shown as being six-sided, that is, hexagonal. In each of the six faces of the part e, there is formed a recess j'; and, when the parts $e^{\times}$ and e are assembled in operative relation, the recesses j' register with or are opposed to the recesses j, and so form with them the mold-cavities j'', which are of such form or shape that a suppository may be molded in each of them. In Fig. 2, each of the recesses j, j', forms exactly one-half of the cavity j''. By means of the lug l in the mold-part $e^{\times}$, which engages in a notch l''

the inner part e of the mold-block E, is limited in its travel within the opening e'' when being seated therein.

In Figs. 5 and 6, there is illustrated a second form of mold-block K, which is three-part and by means of which it is practicable to mold a dozen suppositories at one time or operation. The outer part or member k is formed with a centrally-disposed opening k' into which fits slidably and snugly an intermediate member k'' that is substantially cylindrical in form and that co-acts with the outer part k in a manner similar to the way the inner member e of the mold-block E (Figs. 2, 3 and 4) cooperates with the outer member $e^{\times}$ thereof, as will appear from the following, viz: The wall of the opening k' is formed with recesses m' (in the embodiment disclosed in Fig. 5, nine such recesses are provided, although the number may be more or less, as may be desired), while the opposed outer wall of the part k'' is formed with as many co-acting recesses m'' which are adapted and designed to register with the recesses m' and to form therewith mold-cavities m, each of which is of such a shape that a suppository may be molded therein, when the parts k, k'', are in assembled relation. To expedite and facilitate the bringing of these parts k, k'', into such relation, the member k carries a pin or stud n the inner end of which is arranged to engage in a notch or recess n'' formed in the lower end of the member k''; and when the projecting inner end of the pin n bears against the top of the notch n'' (Fig. 6), the intermediate member k'' is then seated in its proper assembled relation, in which it is held by the pin n against rotatory displacement. The intermediate member k'' is formed with a central longitudinal or axial passage or opening in which is fitted snugly and free to slide an inner mold-block member $k^{\times}$, the outer face of which is formed with recesses m'', while the face or the wall k^{*} of the central bore of the intermediate member k'' is formed with recesses m' which, when the parts are in assembled relation, register and cooperate with the recesses m'' of the inner member $k^{\times}$ and form therewith suppository-shaped mold-cavities m in exactly the same manner as do the corresponding co-acting recesses m', m'', that are formed, respectively, in the opposed walls of the opening k' and the intermediate member k''. Projecting inwardly from the wall k^{*} of the central bore of the cylindrical intermediate member k'', there is the inner end of a second locking stop-pin or stud $n^{\times}$ that is, in all substantial features or respects, similar in structure and function to the stop-pin n (Fig. 6) mounted in the lower end of the outer mold-member k. This second stop-pin $n^{\times}$ engages, when the parts are in assembled relation, with the walls of a notch or recess n^{*} formed in the lower end of the inner mold-member $k^{\times}$ and serves to determine the limit of downward travel thereof, when the same is being seated in assembled relation to its co-acting member k'', and to lock these members $k^{\times}$, k'', together against accidental displacement by turning one within the other.

While, as has hereinabove been pointed out, the recesses j, j', are equal in size and each of these recesses j, j', forms exactly half of the mold-cavity j'', the recesses m', m'', are unequal in size (Figs. 5 and 6); in the particular and preferred embodiment illustrated, the recesses m' are larger than the recesses m''. I have found that, by providing recesses m'' (in the outer face of the intermediate member k'') smaller in size than are their cooperating recesses m' formed in the opposed inner face k' of the outer mold-part k, the suppositories molded in the cavities m are less liable to break during manufacture and afterwards than are suppositories formed in the mold-cavities j'', of which the component complementary recesses j, j', are of equal size.

In Figs. 7, 8 and 9, there is illustrated a third form of mold-block O, which, like the mold block E (Figs. 2, 3 and 4), is two-part, and is made up of the outer mold-member o and the inner mold-member o'' that fits snugly and slidably in an opening o' formed in the outer member o. Instead of mold-cavities that are substantially circular in horizontal section or plan view (as are the mold-cavities j'', m, shown in Figs. 3 and 5, respectively), the cavities p of the mold-block O are oval-shaped when viewed in plan (Fig. 7) and are adapted and designed to mold or give shape to suppositories known to the drug trade as vaginal suppositories. As shown in Figs. 7 and 8, the recesses p', p'', that make up a cavity p and are formed, respectively, in the opposed walls of the outer and inner mold-parts o, o'', are unequal in size, the recess p'' in the inner mold-part o'' being the smaller. The stop-pin $p^{\times}$ (Fig. 9) serves the same function as has hereinbefore been described as being performed by the stop-pin n (Fig. 6), that is, to expedite the bringing of the recesses p', p'', into register with each other and to maintain the mold-parts o, o'', in assembled relation during the molding of the supositories, by its engagement with the walls of the notch p^{*} formed in the lower end of the inner mold-member o''.

The operation of the molding apparatus hereinbefore described is as follows: The top-part or cover c of the body a is removed from the base b by merely slipping it from off the same. The cover c being detached from the base b and the feed-screw f having been withdrawn from the cover c as far as practicable for the purpose intended, the cover c is inverted or turned upside down, so that the plunger-piston or presser-foot i lies at the bottom of the chamber or "barrel" c' in this position of the cover c. The medicament (e. g., a preparation having cocoa-butter as a base) is then poured into the chamber c' of the cover c, which serves, in its inverted position, as a receptacle for the composition. The mold E being in position in the **U**-shaped base b, the cover c is turned right side up and is engaged with the top of the latter, the guide-ribs d being slipped into the guide-grooves b' in the sides of the base b. The suppository composition being of a somewhat plastic nature, is retained in the "barrel" or chamber c', while the cover c is being thus manipulated. In order to force the medicament into the cavities j'' of the mold E, the feed-screw f is turned so that the plunger-piston i is made to approach the mold E, until finally the piston i bears upon the top of the mold E. None of the medicament is lost, for none of it can escape from the apparatus, as will be readily understood from an inspection of Figs. 1 and 2. The mold E is released from the clamping action of the presser-foot i by merely turning the feed-screw f slightly in the opposite direction, whereby the presser-foot i is withdrawn within the chamber c' and from off the mold E, which may then be removed from the base b. The inner mold-member e is then forced (as by pressing it with the thumbs while holding the outer mold-member e^{x} with the fingers) out of the opening e'' in the cooperating mold-member e^{x}, when it will be found that the suppositories cling to the mold-part e and may be readily dislodged therefrom by a light tap with the finger-tip or by the application of light pressure to them, or otherwise. The use of the other forms of mold-blocks K, O, illustrated in Figs. 5 to 9, both inclusive, differs not substantially from the manner in which the mold-block E is used; but I prefer to operate the apparatus with the mold-blocks K, O, wherein the mold-cavities m, p, are so formed or made up that the points of the suppositories molded therein project or lie outside of the recesses m'', p'', in which the suppositories lie and are carried after the mold-parts are separated from one another (or each other, as the case may be) upon the completion of the molding operation, as hereinbefore briefly described.

The machine is made of the same alloy as that used in the manufacture of surgical instruments and is rust-proof. Moreover, the medicament or healing preparation of which the molded articles are composed does not stick to the mold-parts tenaciously but such articles may be freed or dislodged from the inner mold-part, after its separation from its cooperating mold-part, by touching them lightly with the finger; thus the loss due to breakage of the molded articles is reduced.

I am aware that machines for the production of molded medicaments, such as suppositories, have been heretofore devised and are known, and that the use of a screw-fed piston or presser-foot in such machines is likewise old. I am further aware of the United States patent granted H. R. Heyl on April 29, 1879, No. 214775, whereby there is disclosed the use of a sectional or two-part mold.

This application is filed as a continuation in part of my pending application, Serial No. 568,048, filed June 13, 1922.

I claim:

1. An apparatus of the character described, including a mold-block consisting of a plurality of mold-parts, one of which lies within the other and both of which are provided with recesses that are parts of a mold-cavity; a holder for the mold-block; and means for forcing into the mold-cavity therein the material that is to be given shape.

2. An apparatus of the character described, including a mold-block consisting of a plurality of mold-parts, of which one is pierced through from top to bottom and the other of which is slidably mounted in the opening so formed and is accessible for ejection therefrom by the operator's pressing on one of its exposed ends; a wall of the opening being formed with a recess and the opposed wall of the mold-part slidably mounted in the opening being also formed with a recess, said recesses being parts of a mold-cavity; a holder for the mold-block; and means for forcing into the mold-cavity therein the material that is to be given shape.

3. An apparatus of the character described, including a mold-block consisting of a plurality of mold-parts, one of which lies within the other and both of which are provided with recesses that are parts of a mold-cavity, the recesses being unequal in volume; a holder for the mold-block; and means for forcing into the mold-cavity therein the material that is to be given shape.

4. An apparatus of the character described, including a mold-block consisting of a plurality of mold-parts, one of which lies within the other and both of which are provided with recesses that are parts of a mold-cavity, the recesses being unequal in volume and the larger recess being formed in the outer mold-part; a holder for the mold-block; and means for forcing into the mold-cavity therein the material that is to be given shape.

5. An apparatus of the character described, including a mold-block formed with a mold-cavity and consisting of a plurality

of mold-parts, one of which lies within an opening formed in the other or outer mold-part and is lengthwise slidable therein; the mold-cavity being smaller at one end than at the other and lying partly in one of the mold-parts and partly in the other thereof and the smaller end of the mold-cavity being located in the outer one of the mold-parts, each of which is provided with a recess that forms a portion of the mold-cavity; a holder for the mold-block; and means for forcing into the mold-cavity therein the material that is to be given shape.

Signed at the borough of Richmond, in the city of New York, county of Richmond and State of New York, this 2nd day of May, 1923, in the presence of the two undersigned witnesses.

SAMUEL K. APPLEBAUM.

Witnesses:
RALPH CICCARELLI,
MAX LEVY.