(No Model.) 2 Sheets—Sheet 1.

D. H. CAMPBELL.

WAX POT FOR USE IN MACHINES FOR WAXING THREAD.

No. 456,536. Patented July 21, 1891.

Fig. 1.

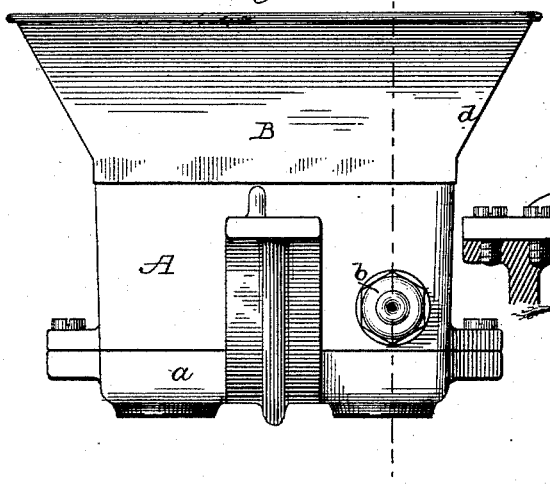


Fig. 3.

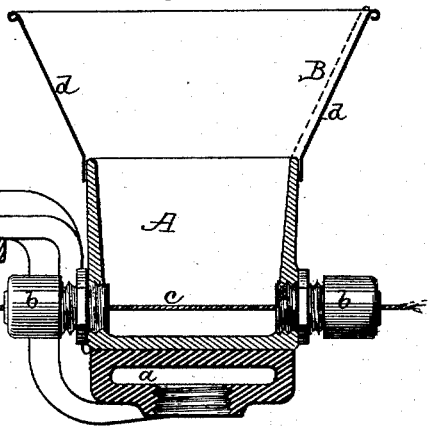
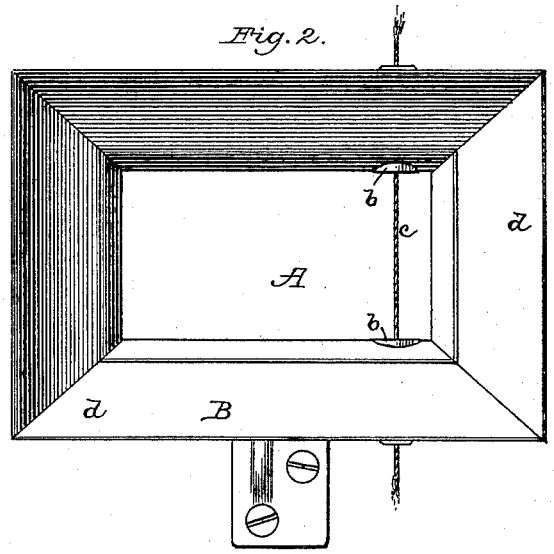


Fig. 2.



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(No Model.) 2 Sheets—Sheet 2.

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WAX POT FOR USE IN MACHINES FOR WAXING THREAD.

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Fig. 4.

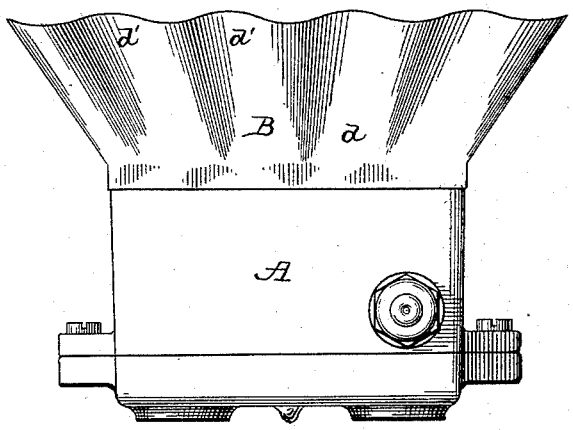
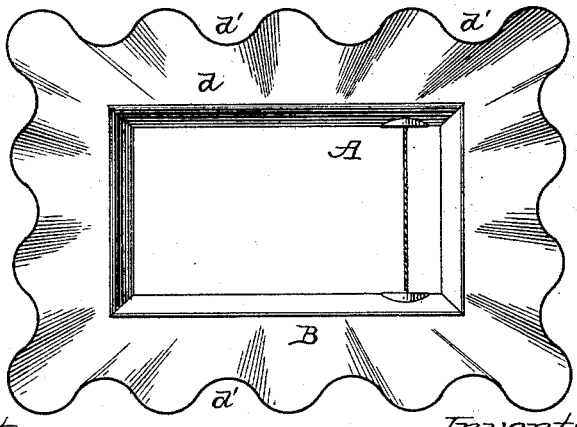


Fig. 5.



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UNITED STATES PATENT OFFICE.

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WAX-POT FOR USE IN MACHINES FOR WAXING THREAD.

SPECIFICATION forming part of Letters Patent No. 456,536, dated July 21, 1891.

Application filed January 15, 1886. Serial No. 188,704. (No model.)

To all whom it may concern:

Be it known that I, DUNCAN H. CAMPBELL, of Pawtucket, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Wax-Pots for Use in Machines for Waxing Thread; and I do hereby declare that the following specification, taken in connection with the drawings furnished and forming a part of the same, is a clear, true, and complete description of my invention.

Although my said improvements have been mainly devised for use in connection with sewing-machines and with hard wax, they are also desirable in other connections—such, for instance, as machines for waxing thread and winding it into cops or upon bobbins, and whether the wax be of the hard or the soft varieties. It is well-known that regardless of the particular character of the wax it should be thoroughly heated, so as to be sufficiently well liquefied to enable it to promptly and thoroughly permeate the thread, and also so that all surplusage may be properly removed and leave the charged thread in a compact and reasonably smooth-surfaced condition. It is equally well known that heated wax is specially liable to abrupt ebullition, and that the closest attention is required to prevent wax-pots from boiling over, with the attendant wasteful results, not only in wax, but in keeping the adjacent portions of the machine neat and suitable for use on fine work. What is of far more consequence, however, I find that if wax be permitted to boil, its temperature rapidly rises, resulting either in so burning the wax or driving therefrom certain valuable volatile matter as to greatly impair its value for the purposes intended. In charging ordinary thread-waxing pots with fresh wax from time to time considerable care must be exercised in avoiding overcharging the pot, the bulk of wax being greatly increased by heating, and the desirability of maintaining a constant and liberal supply in the pot is well known to be conducive to such overcharging. With at least all these points in view I have for the first time, as I believe, devised a wax-pot which can always be kept liberally charged with wax and heated thoroughly without any liability of overheating or boiling over and which involves only a minimum loss of desirable volatile matter from the wax.

A wax-pot embodying my invention has what I will term a "heating-section" and a "cooling-section." In other words, it has a section or portion thereof specially adapted for holding and heating the main body or mass of wax and another section or portion having outwardly-flared walls and specially adapted for cooling the wax whenever it has been heated above the point requisite for enabling it to properly permeate thread. The interiors of these two sections communicate with each other, and the heating-section is below the cooling-section, so that if heat be unduly applied to the normal contents of the heating-section the wax will expand and more or less of it will rise and occupy the cooling-section and be therein enabled to radiate or otherwise throw off such excess of heat as might injure the wax. This capacity in the cooling-section to facilitate the elimination of heat is due to the fact that it can afford to the upper portion of the mass of heated wax successively increased areas of exposure to free radiation of heat. If with a pot thus improved a full charge of wax be used, the moment it becomes unduly heated it will more or less suddenly rise in ebullition, the upper portion of the wax will occupy the flaring cooling-section, and its upper surface will therefore be gradually increased, free radiation of heat will be afforded, and an equilibrium promptly restored.

Prior to my invention, so far as I know, wax-pots have been so provided with thread-conducting contrivances as that the thread either passed downward into the wax beneath a bar and thence upward out of the wax, or downward and through the bottom of the cup, or upward from a ball submerged in the cup. It is well known that shoe-thread wax as used with sewing-machines or for waxing thread for use in such machines is liable to contain and the cups to receive more or less extraneous and objectionable matters, of which the lighter will float and the heavier settle to the bottom of the cup; also, that the upper portion of the contents of a cup should be kept at a comparatively low temperature, and therefore thread in passing downward and

upward, or even downward alone or upward alone, is more or less charged with wax at an unfavorable temperature, it being obvious that for obtaining a perfect saturation the wax should be liquefied to the highest possible degree consistent with a proper and safe temperature. In either of the prior methods the thread is exposed to solid sedimentary matter as well as to the floating matter.

In accordance with another feature of my invention I have restricted the path of the thread to the portion of the wax which must always be at a temperature most favorable to a complete saturation of the thread, and also guard it from contact with all extraneous matter, whether at the top or the bottom of the mass of wax, and this is accomplished by providing the sides of the cup at a short distance above its bottom with a pair of coincident tubular heads, through which the thread passes into and from the cup.

After fully describing the wax-pots illustrated in the drawings, the features deemed novel will be specified in the several clauses of claim hereunto annexed.

Referring to the drawings, Figures 1, 2, and 3 represent, respectively in side elevation, top view, and vertical section, a wax-pot embodying my invention in what I deem its best form. Figs. 4 and 5 in side and top view illustrate another variety of wax-pot in which an extraordinary area of exposure is afforded for lateral radiation.

In the wax-pot shown in Figs. 1 to 3, inclusive, the heating or base section A is, as heretofore, constructed of heavy cast metal, and it may be integrally provided with the well-known steam-chamber *a*, if desired; but as here shown, said steam-chamber is located within a steam-table in the form of a bracket, upon which the wax-pot is mounted and secured in place by means of screws, as clearly indicated. Tubular heads *b*, coincident with each other in the walls of the pot at a short distance above its bottom, are here shown as devised by me, the thread *c* passing through the centers of these heads and through the contents of the pot at a point therein most favorable to good results.

In my prior Letters Patent No. 253,157, January 31, 1882, I disclosed tubular heads in connection with auxiliary wax-chambers supplied from a main pot, and in my prior application for Letters Patent, filed February 12, 1885, Serial No. 155,708, I disclosed a novel form of tubular head with packing and follower specially well adapted for use in wax-pots as herein described, as well as in connection with the auxiliary waxing-chamber described in said application.

The cooling-section B surmounts the heating-section and constitutes in substance a vertical extension thereof. As here shown, its metal walls *d* flare outwardly, and they are as thin as is compatible with strength. It is immaterial how the two sections are united so long as they afford a tight joint, and it is not necessary that the two sections be separately constructed, it being obviously possible and even practicable, mechanically speaking, to have the two sections formed integrally in either cast or wrought metal. As an illustration, let it be assumed that the heating-section is four inches long and two inches in depth and width and that the cooling-section is of equal depth, but flares one inch at each side and end. The horizontal area of such a pot at the heating-section would be eight inches and at the top twenty-four inches, thus affording a gradual increase of surface area alone, which would practically prevent the pot from boiling over. The thin metal walls, being practically incapable of directly conducting much heat from the walls of the heating-section, afford an opportunity for free lateral radiation from the rising wax, which will always insure a body of wax at comparatively low temperature adjacent to said walls and render it practically impossible to unduly heat the central portion.

Now it will be readily seen that substantially valuable results will accrue if the flaring walls *d* were as thick and heavy as the walls of the heating-section—as, for instance, as indicated in dotted lines at the right-hand portion of Fig. 3—because, although said walls would be more or less directly heated from their bases upward, the successively-increased area for vertical or surface radiation would be afforded by the flaring of the walls.

In Figs. 4 and 5 the wax-pot shown differs from that previously described only in that the thin walls *d* of the cooling-section are deeply corrugated, as at *d'*, so as to afford a maximum area for lateral radiation with a desirable area of surface radiation and to cause considerable bodies of cooled and more or less solid wax to be held suspended on said side walls, with which a more or less prompt exchange of temperature will be made by the heated wax when rising in ebullition.

It is not to be understood that I claim to have first devised a kettle or vessel having a flaring top, because I am well aware, for instance, that such soap-kettles as are commonly used in large factories have been so constructed solely with reference to controlling undue ebullition and overflow, and whereas by my improvement in wax-pots I have in like manner provided against overflow as one of the objects sought the main and prime value of my invention is the obviation of all injury to the wax due to overheating and to the loss of such volatile matter as should be retained therein for enabling it to successfully perform its water-resisting and preservative functions, and at the same time to provide for such a well-heated condition of the wax as will enable it to be properly incorporated with thread while passing through the wax-pot.

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

A thread-waxing pot having a heating base-section and an upper cooling-section composed of outwardly-flaring walls and provided with coincident tubular heads provided with flexible packing and located opposite each other in the sides of the pot above its bottom, substantially as described, whereby thread may be passed into and from the pot and directly through the most favorably-heated portion of its contents and prevented from contact with floating and gravitating extraneous matter, as set forth.

DUNCAN H. CAMPBELL.

Witnesses:
J. F. BROWNING,
WM. N. HODGES.