Aug. 20, 1935. F. C. CHOICE ET AL 2,011,615

THREAD WAXING DEVICE

Filed March 20, 1933 2 Sheets-Sheet 1

Fig. 1

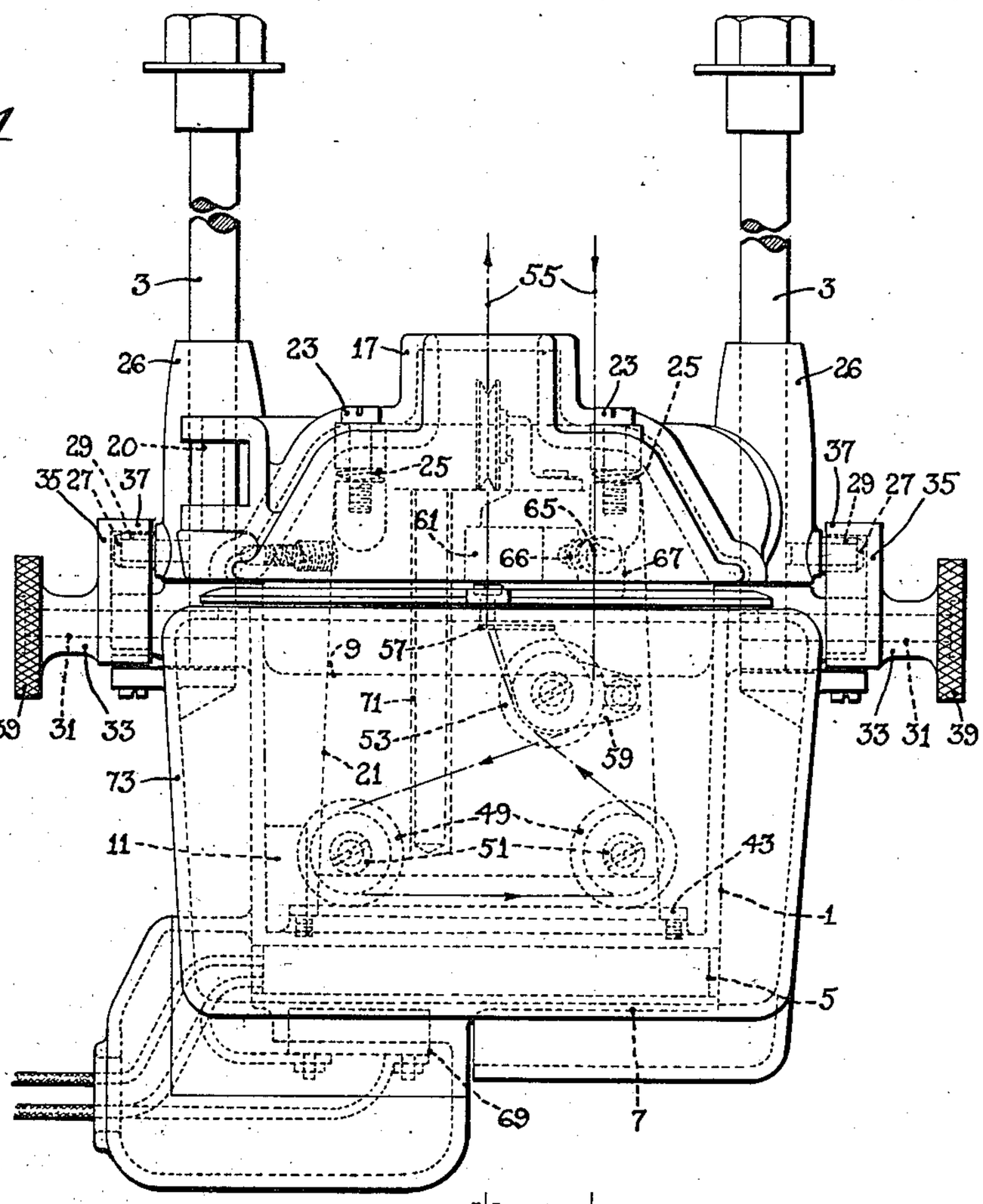

Fig. 4

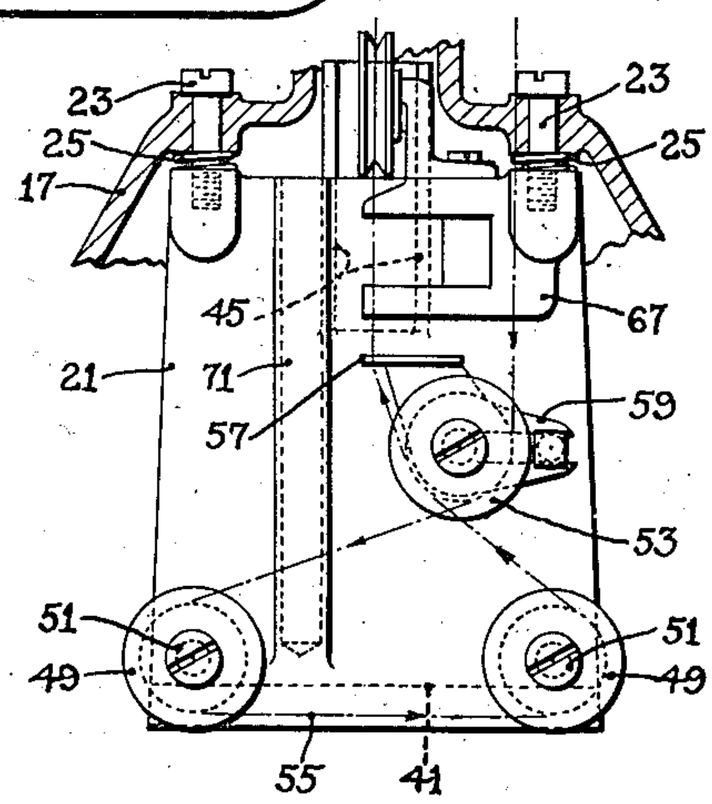

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Fig. 3

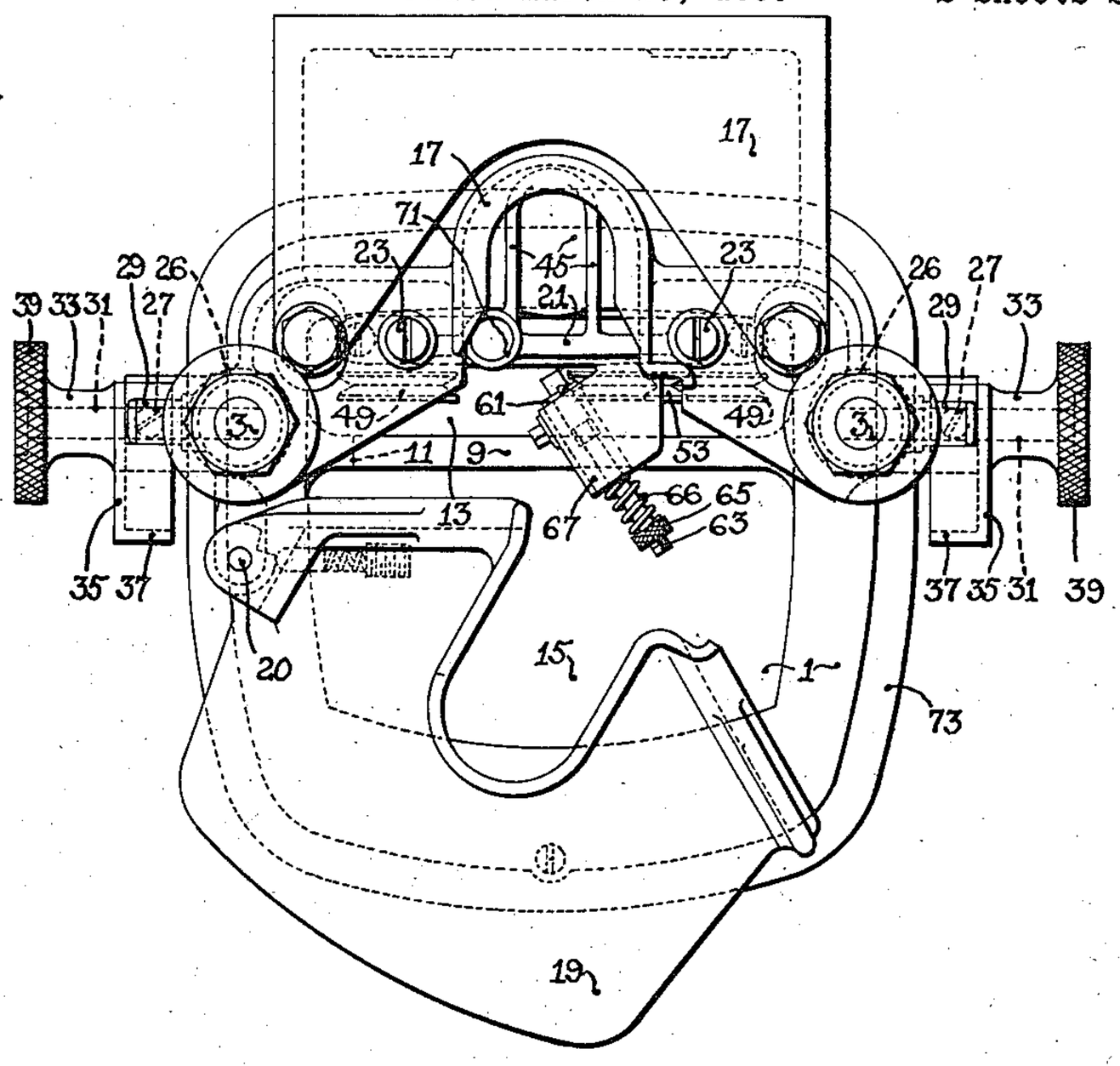
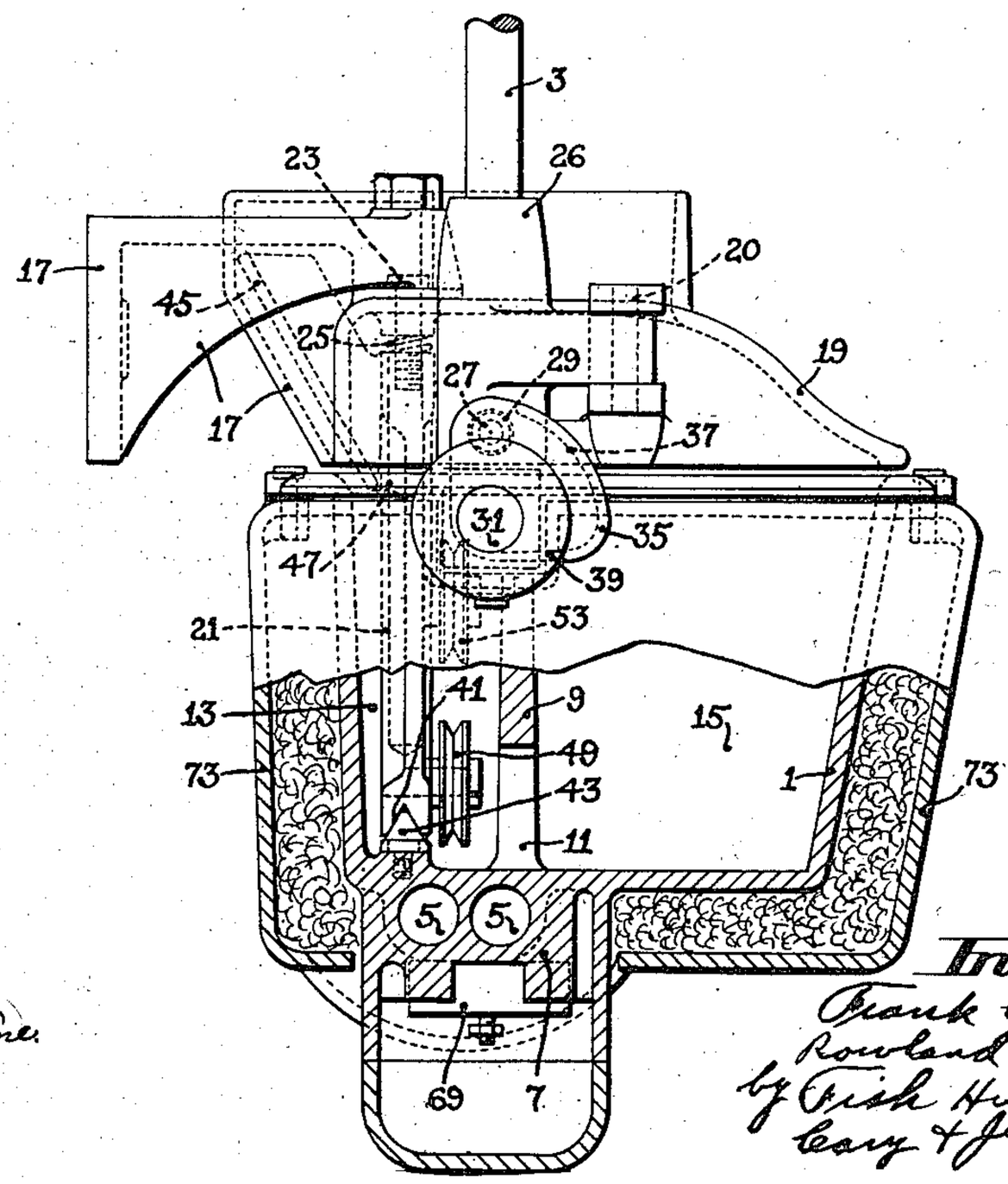


Fig. 2



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UNITED STATES PATENT OFFICE

2,011,615

THREAD WAXING DEVICE

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Application March 20, 1933, Serial No. 661,726
In Great Britain April 28, 1932

19 Claims. (Cl. 91—46)

This invention is concerned with improvements in or relating to thread waxing devices and is hereinafter illustratively described in connection with a thread waxing device suitable for use on a boot or shoe sewing machine.

Sewing machines of various kinds are used in the boot and shoe industry for sewing the uppers and welts of welted shoes to insoles, for sewing outsoles to the welts of such shoes, for sewing the uppers of turnshoes directly to their soles and for sewing the outsole of a Blake or McKay shoe to the insole.

Sewing machines of the various kinds above indicated are customarily provided with wax-pots which are arranged to be heated by suitable means to melt wax placed in them and have associated with them thread-guiding means which constrain the thread to pass through the melted wax in the wax-pot to become coated thereby before it passes to the sewing instrumentalities of the machine.

The advantages derived from using waxed thread in such sewing machines as have been mentioned are well understood and need not be particularized herein.

The thread guiding means aforementioned which constrain the thread to pass through the melted wax in the wax pot to become coated thereby usually comprise thread-guiding rolls which are supported within the body of wax in the wax pot.

It is desirable that the said thread guiding rolls should be heated by means additional to the hot wax in order to ensure that they shall be maintained at an adequate temperature so that the wax on the thread shall not be cooled and hardened by contact with them.

It is also desirable that the wax-pots of such machines should be of sufficient capacity to accommodate a relatively large amount of wax so as to avoid the need for frequent replenishment, and that the means for melting the wax should be capable of melting the wax quickly (for example at the beginning of a day's work) without overheating the wax and thereby destroying some of its desirable qualities.

When wax-pots of the kind at present in general use are arranged to accommodate a relatively large supply of wax it becomes difficult to arrange for rapid melting of the body of the wax by heating means external to the wax pot since although the wax lying closest to the heating means may melt comparatively quickly yet, since the wax itself is but a poor conductor of heat, the wax which lies out of contact with the walls of the wax pot melts but slowly. If heating means in the interior of the pot is made use of to melt the wax and is arranged to give off a relatively intense heat to melt the wax rapidly, there is a danger that the wax in the immediate vicinity of the heating means will become overheated and charred, while wax which is remote from the heating means will melt only slowly.

One of the several objects of the present invention is to provide a novel and improved means in a wax pot to obtain efficient heating of the thread guiding rolls when the wax pot is secured in its operative position.

Another of the several objects of the present invention is to provide a novel and improved form of wax pot of relatively large capacity in which a portion of the wax in it may be rapidly melted without being overheated.

Another of the several objects of the present invention is to provide a novel and improved form of wax pot which shall be relatively simple in construction and efficient in use.

In an illustrative embodiment of the present invention hereinafter described, a wax pot is provided in which the thread guiding rolls are carried upon a vertical plate arranged to contact with the heated bottom of the wax pot to be heated thereby, thus serving not only to heat by conduction the thread guiding rolls which it carries, but also serving to heat the wax on either side of it. Means are also provided to clamp the bottom of the wax pot against the roll carrying plate.

Further, in the said illustrative embodiment the contacting faces of the plate and wax pot are not plain but the bottom of the wax pot has a V-shaped rib running along it on that portion against which the bottom of the said plate presses and the bottom of the plate has a V-shaped groove running along the length of the plate so that as the wax pot is raised towards the plate, the rib on the wax pot bottom enters into and presses against the sides of the groove in the plate and establishes firm contact therewith over a side area. Any wax which flows within the groove in the bottom of the plate when the wax pot is lowered from the plate will, before it hardens and sets, tend to run down the sloping sides of the groove, thus leaving them clean.

In the illustrative form of wax pot hereinafter described which is specially suitable for use in a boot or shoe sewing machine, the wax pot is heated by means housed at its bottom and is divided into two compartments by a partition which contacts with the heated bottom and is

itself heated thereby and extends upwardly therefrom, communication being provided between the compartments through an opening in the partition. Also, in the said illustrative form the thread guiding rolls are arranged on the plate member in the wax pot in such a manner that thread passing round them lies close to the heated bottom of the wax pot and parallel to it, thus ensuring that it is acted on by wax which is maintained in a very fluid condition due to the close presence of the heating means.

In order that the nature of the present invention may be more clearly understood, the illustrative form of wax pot aforementioned will now be described with reference to the accompanying drawings.

In the drawings:—

Figure 1 is a front view of the said illustrative form of wax pot;

Figure 2 is a side view partly broken away, of the wax pot seen in Figure 1;

Figure 3 is a plan view of the wax pot showing a cover for the pot partially removed from over the pot; and

Figure 4 is a front view of certain parts of the wax pot.

In the said illustrative form the wax pot comprises a metal casting 1 (see particularly Fig. 2) of a substantially cubical shape with an open top, of a sufficient size to hold about two pounds of wax. The wax pot is carried upon the lower ends of a pair of sliding vertical rods 3 which pass through bearings in a fixed portion of a cover for the pot. A pair of electrical heating elements 5, 5 are arranged within a thickened portion 7 (see Figure 2) of the bottom of the wax pot which portion extends downwardly from the pot and these elements extend, near the back of the pot, parallel to the latter across the pot. A vertical web or partition 9 of metal extends across the wax pot generally parallel to the back thereof and some distance in front of the latter, and this web is joined to the sides and bottom of the wax pot and is so located in it that it lies substantially over the forward end of the downwardly extending portion 7 of the bottom of the pot in which the heating elements 5 lie. The bottom of this web, which as before stated is joined to the bottom of the wax pot, lies as shown in Figure 2, slightly forwardly of the forward one of the heating elements 5 and becomes heated by direct conduction from the thickened portion of the bottom of the pot. The web extends almost to the top of the pot, as shown in Fig. 1, and has a single passage or opening 11 formed in its lower end at the left hand side to provide communication between the two parts of the pot separated by the web. As is hereinafter more specifically referred to, the fact that but a single opening is provided in the web to provide communication between the two parts of the pot separated by the web, while allowing wax to flow freely from the part of the wax pot in front of the web into the part of the wax pot behind the web, prevents a circulation of the wax from taking place around the front and rear sides of the web. The two parts into which the web divides the pot are of unequal capacity, the one 13 between the web and the rear wall of the pot forming a smaller or narrower compartment and having a wax holding capacity equal to less than half that of the larger compartment 15 lying between the web and the front wall of the pot. The rearward heating element 5 of the pair of heating elements lies, in the illustrative form of wax pot, directly underneath the smaller compartment 13, so that wax in this compartment will be heated rapidly. Further heating of wax in the smaller compartment 13 will take place due not only to the fact that the web 9 (which constitutes the front wall of this compartment) is heated by actual contact with the thickened portion 7 of the bottom of the wax pot which houses the heating elements, but also due to the fact that the rear wall of the pot (which also comprises the rear wall of this smaller compartment) and also the sides of this compartment are heated by direct conduction from the heating elements. Therefore the smaller compartment is heated on all its sides and its bottom by heating elements positioned directly beneath the smaller compartment and since it is narrow from front to back, wax in it will melt quickly. Also due to the fact that the whole of the bottom and sides of the wax pot including its front wall become directly heated by the elements 5, wax placed in the larger compartment 15 will also be melted though more slowly than the wax in the smaller compartment 13, and can therefore flow into the latter through the opening 11 in the web 9 to replace wax used therefrom. A relatively fixed supporting bracket member 17 (see Figures 2 and 3) secured to the frame of the machine (which may for example be a boot or shoe sewing machine) with which the wax pot is to be used, extends forwardly over the pot for a short distance from its rear and cooperates with a removable member 19 (which is shown in Figure 3 in a position swung somewhat away from over the pot) freely mounted on a pivot 20 carried in ears projecting from the fixed member 17 in front of the left hand one of said rods 3 to constitute a cover for the pot.

A feature of the present invention comprises a plate 21 (see Figures 1 and 4) which is somewhat narrower at the top than the bottom, lying substantially parallel to the back of the wax pot and having upwardly extending pins 23 secured to its upper edge close to its opposite sides and these pins project upwardly through bearings in the fixed member 17. Short springs 25 are located on the pins 23 between the top of the plate 21 and the underside of the member 17 and urge the said plate downwardly until it is arrested by contact between the member 17 and heads on the upper ends of said pins. The plate 21 is so positioned on the member 17 and is of such size that when the wax pot is in proper position to wax thread passing through it, the said plate is received within the smaller compartment 13 of the pot and extends a substantial distance across the pot fairly close to its rear wall.

The plate 21 carries on its forward side and near its lower corners two thread guiding rolls 49 which are freely rotatable on pins 51 projecting forwardly from the plate. The plate also carries on its forward side a third thread guiding roll 53 which is positioned slightly to one side of the plate and about half way up the height of the latter. The thread 55 is arranged (as shown clearly in Figure 1) to pass into the wax pot through an opening formed partly in the fixed part 17 of the cover and partly in the movable part 19 of the cover and passes first around the right hand side of the third thread guiding roll 53. From this roll the thread passes across the plate to the guide roll 49 which is positioned near its left hand bottom corner and passes downwardly around this roll and then proceeds in a horizontal direction fairly close to the heated

bottom of the pot towards the thread guide roll 49 near the right hand bottom corner of the plate. The thread passes upwardly around this roll and from thence across to the left hand side of the third thread guide roll 53 from which it passes upwardly out of the wax pot. As the thread passes upwardly from the roll 53 it passes first of all over the edge of a relatively thin metallic stripper plate 57 which is secured to a small plate 59 fixed to the plate 21 and through which the pivot pin for the roll 53 passes and which stripper plate serves to remove any globules of wax which may be adhering to the thread. From this stripper the thread passes upwardly through a second stripper arrangement. This second stripper arrangement comprises a metallic block 61 (see Fig. 3 particularly) with a V-shaped opening running vertically in its inner face against which the thread is held pressed by a spring pressed plunger 63 having a vertical slot in it near its inner end through which the thread passes. The cooperating faces on the plunger 63 and the block 61 grip the thread between them with a pressure which is adjustable by means of a nut 65, threaded onto the forward end of the plunger 63, which can be rotated to adjust the strength of the plunger spring 66. The stripper block 61 is housed in a carrier member 67 (see Fig. 4) which is secured to the plate 21 which carries the thread guiding rolls 49 and 53 so that the stripper becomes directly heated by heat conducted to it from the plate and does not tend to congeal the wax on the thread as it would if the stripper were not heated by any means. By mounting the stripper on the plate in this manner the necessity for providing separate heating means for it is avoided. If desired, a stripper of the rubber block may conveniently be employed in place of the metallic stripper just described.

The wax pot is arranged to be lowered away from the plate 21 to allow the thread to be passed around the thread guiding rolls on the plate 21 when the wax pot is to be put into use and is also arranged to be lifted and clamped positively into contact with the bottom of the plate 21 after the thread has been placed around the thread guiding rolls. For this latter purpose the two sliding vertical rods 3 upon which the wax pot is carried pass, as before stated, through vertical bearings, indicated at 26, in the fixed member 17 and the bearings each have a short pin 27 (see Figs. 1 and 3) projecting horizontally and laterally therefrom and each of these pins has a roll 29 freely rotatable on it. The left and right hand walls of the wax pot have fixed pins 31 extending laterally therefrom near their upper edges below and parallel to the pins 27 on the fixed member 17 (see Figure 1). Sleeves 33 are freely pivoted on the pins 31 and these sleeves are secured against axial movement on the pins by heads on the outer ends of the latter. The sleeves 33 have formed on their inner ends cam members 35 which have overhanging flanges 37 around their outer edges which extend horizontally inwards towards the wax pot. The overhanging flanges subtend an angle at the axis of the sleeves approximately equal to a right angle and extend, before the sleeves are rotated in the manner hereinafter described, from a position substantially horizontally in front of the axis of the sleeves upwardly and rearwardly to a position just forward of the vertical plane containing the axis of the sleeve. The radial distance of each of the overhanging flanges 37 from the axis of its sleeve decreases gradually from its upper end towards its lower and more forward end thus providing an overhanging snail cam the portion of which having the least radius is positioned on the lower portion of the cam in front of the sleeve. Knurled hand wheels 39 are provided on the outer ends of the sleeves 33 by which the sleeves and cam members 35 may be rotated in a rearward direction (i. e. a counter clockwise direction looked at from the left of the machine) when the wax pot has been lifted bodily so far by hand from a lowered inoperative position that the upper ends of the cam members are approximately level with the upper surfaces of the rolls 29 on the pins 27 which are secured in the fixed cover member 17. When the wax pot has been raised so far and the hand wheels 39 are rotated in the direction indicated, the action of the snail cams in riding over the rolls 29 will cause the wax pot to be lifted positively a small amount, thus causing the bottom of the wax pot to be pressed firmly against the bottom of the vertical plate 21 which, by reason of its being urged downwardly by the springs 25, can yield upwardly somewhat as the bottom of the wax pot is forced against it. Once the cams have been caused to ride over the rolls 29 to lift the wax pot into firm contact with the bottom of the plate 21 they serve to clamp and retain the said wax pot pressed upwardly against the plate. Thus assurance is afforded that heat will be able to pass directly from the heated bottom of the wax pot to the plate 21 and the members carried by it.

In order to prevent wax which may settle on the bottom of the plate 21 when the wax pot is lowered out of contact with the plate 21 from preventing firm contact between the bottom of the plate and the bottom of the wax pot when the latter is once more raised to its operative position, an inverted V-shaped groove 41 is formed along the bottom of the plate 21 and an upstanding V-shaped rib or ridge 43 is provided on the bottom of the wax pot to engage within and press against the sides of the groove 41 as the wax pot is forced upwardly against the plate (see Figure 2). The sides of the said groove and ridge are somewhat steep so that any wax which may remain in or find its way into the groove after the wax pot has been lowered from the plate will, before it sets, tend to run down the sides of the groove and leave the internal faces of the groove clean. The top of the ridge 43 is flattened a small amount so that a small gap exists between the top of the ridge and the apex of the groove 41 into which any wax wiped upwardly along the sides of the groove in the plate as the ridge moves upwardly into contact with them may escape. It will be observed that the ridge and groove arrangement between the plate 21 and the bottom of the wax pot provides a relatively large area of contact, between the heated bottom of the wax pot and the plate, which ensures that an adequate supply of heat shall be conducted to the plate.

The plate 21 has projecting from one side upwardly and rearwardly from it near its upper end and centrally thereof a neck 45 (see particularly Figure 2) which projects through the mouth of the wax pot and is arranged to extend beneath a thread tension device with which the machine with which the wax pot is associated may be provided and around which tension device the thread passes from the wax pot. The neck 45 is semi-cylindrical in section (its open side being directed towards the front of the wax

pot and serves to catch and deflect into the wax pot through an opening 47 in the neck any portions of wax which are stripped from the thread by the said tension device.

From what has been said above, it will be understood that the wax pot of the present illustrative embodiment can be lowered away from the plate 21 when the hand wheels 39 have been rotated forwardly to cause the overhanging flanges 37 of the cam members 35 to ride out of engagement with the rolls 29. When it is desired to raise the pot once more to operative position against and surrounding the pate 21, it is lifted by the operator until the upper ends of the overhanging flanges 37 are level with the tops of the rolls 29 and the hand wheels 39 are then rotated rearwardly to cause, by the lifting cam action of the cams on the rolls, the V-shaped ridge 43 on the bottom of the pot to engage within and be pressed firmly against the sides of the groove 41 in the bottom of the plate 21, thus ensuring that heat will readily be conducted from the heated bottom of the wax pot to the plate and thence to the thread guiding rolls and wax stripping devices carried thereon.

The heating elements 5 before mentioned for the wax pot have different heating capacities and the larger one of the two is controlled by a thermostat 69 which controls the current fed to it to maintain the temperature of the wax in the pot between certain predetermined limits. The thermostat 69 is shown as located on the exterior of the bottom of the pot and is of the bimetallic plate type.

However a thermostat of the gaseous expansion type controlling by means of an expansible bellows a mercury switch may be employed and in such a case a liquid containing tube of the thermostat could conveniently be housed in the wax pot within a bore provided for it in a vertical boss 71 (indicated in Fig. 1) on the plate 21. In order to minimize the amount of heat lost due to radiation by the wax pot the latter is completely surrounded on all its sides and bottom by an aluminum casting 73 which is larger than the lot, the space between the casting 73 and the pot being filled with lag wool or felt.

As has been heretofore stated, there is provided in the web 9 only one opening 11, the reason for this being as follows. The rotation of the thread guiding rolls 49 and 53 caused by drawing thread through the wax pot tends to set up a circulatory effect in the wax and were there two openings formed in opposite sides of the web, the wax would tend to circulate through the openings and around the front and rear sides of the web 9, thus tending to lower the temperature of the wax in the smaller compartment which it is desired to maintain at a higher temperature than that of the wax in the larger compartment. By providing only one opening 11 in the web, circulation of wax around the web is prevented while still providing adequate communication between the two compartments.

The nature and scope of the invention, having been indicated, and a machine embodying the several features of the invention having been specifically described, what is claimed is:

1. Thread waxing devices for sewing machines having, in combination, a wax pot, means for heating the bottom of the wax pot, thread guides within the wax pot, and a plate for supporting said thread guides having heat conducting contact along one edge with the bottom of the pot, said plate and pot being relatively movable to permit access to the thread guides.

2. Thread waxing devices for sewing machines having, in combination, a fixed mounting member, a wax pot movably mounted on said member, means for heating the bottom of the wax pot, thread guides within the wax pot and a plate for supporting said thread guides depending from the fixed member downwardly into the wax pot and having heat conducting contact along one edge with the bottom of the pot.

3. Thread waxing devices for sewing machines having, in combination, a wax pot, means for heating the bottom of the wax pot, thread guides within the wax pot, a plate having heat conducting contact along one edge with the bottom of the pot, and resilient means for maintaining said contact, said plate and pot being relatively movable to permit access to the thread guides.

4. Thread waxing devices for sewing machines having, in combination, a fixed mounting member, a wax pot movably mounted on said member, means for heating the bottom of the wax pot, thread guides within the wax pot, a plate depending from the fixed member downwardly into the wax pot and contacting along one edge with the bottom of the pot for supporting said thread guides, and resilient means interposed between the fixed member and the plate for urging the contacting edge of the plate against the wax pot.

5. Thread waxing devices for sewing machines having, in combination, a wax pot, means for heating the bottom of the wax pot, thread guides within the wax pot, and a plate arranged with a grooved surface along the bottom edge in heat conducting contact with a correspondingly shaped upstanding rib on the bottom of the pot for supporting said thread guides, said plate and pot being relatively movable to permit access to the thread guides.

6. Thread waxing devices for sewing machines having, in combination, a fixed mounting member, a wax pot movably mounted on said member, means for heating the bottom of the wax pot, thread guides within the wax pot, a plate on the mounting member arranged with an inverted V-shaped groove surface along the bottom edge in heat conducting contact with a correspondingly shaped upstanding rib on the bottom of the pot for supporting said thread guides, and means for forcing the wax pot upwardly against the plate.

7. Thread waxing devices for sewing machines having, in combination, a wax pot, means for heating the bottom of the wax pot, thread guides within the wax pot, a plate for supporting said guides having heat conducting contact along its lower portion with the bottom of the pot, and a wax stripper mounted on said plate, said plate and pot being relatively movable to permit access to the thread guides.

8. Thread waxing devices for sewing machines having, in combination, a wax pot, means for heating the bottom of the wax pot, thread guides within the wax pot, a plate having heat conducting contact along its lower portion with the bottom of the pot for supporting said thread guides, and a neck extending from said plate arranged to catch and to deflect into the wax pot portions of wax which are stripped from the thread as it leaves the pot, said plate and pot being relatively movable to permit access to the thread guides.

9. Thread waxing devices for sewing machines

having, in combination, a fixed mounting member, a wax pot movably mounted on said member, means for heating the bottom of the wax pot, thread guides within the wax pot, a plate mounted on said member having heat conducting contact along its lower portion with the bottom of the pot and extending upwardly and to one side of the pot to form a neck arranged to catch and to deflect into the wax pot any portions of wax which are stripped from the thread as it leaves the pot.

10. Thread waxing devices for sewing machines having, in combination, a wax pot having an open top, a vertical partition in the wax pot forming two intercommunicating compartments of unequal size, means in the smaller compartment for guiding thread through the open top into and from the wax contained in the pot, and a heating element beneath the partition arranged to heat the wax in the smaller compartment more rapidly than the wax in the larger compartment.

11. Thread waxing devices for sewing machines having, in combination, a wax pot having an open top arranged with a vertical partition to form two intercommunicating compartments of unequal size, means in the smaller compartment for guiding thread through the open top into and from the wax contained in the pot, electrical heating elements arranged to heat the wax in the smaller compartment more rapidly than the wax in the larger compartment, and a thermostat for controlling one of said elements to cut it out of operation when the temperature of the wax in the pot has reached a predetermined value.

12. Thread waxing devices for sewing machines having, in combination, a wax pot having an open top, a partition in the wax pot forming two intercommunicating compartments of unequal size, means in the smaller compartment for guiding thread through the open top into and from the wax contained in the pot, electrical heating elements arranged to heat the wax in the smaller compartment more rapidly than the wax in the larger compartment, and a thermostat for controlling one of said elements to cut it out of operation when the temperature of the wax in the pot has reached a predetermined value, the other heating element not controlled by said thermostat being arranged to heat the partition directly.

13. Thread waxing devices for sewing machines having, in combination, a wax pot, an intermediate partition in the wax pot forming two compartments of unequal size, means in the smaller compartment for guiding thread through the wax contained in the pot, a heating element beneath the partition arranged to heat the wax in the smaller compartment more rapidly than the wax in the larger compartment and a passage provided at one point only through the partition arranged to provide adequate communication between the two compartments while preventing circulation of the wax around the partition from movement imparted by the thread.

14. Thread waxing devices for sewing machines having, in combination, a fixed mounting and cover member, having vertical bearings, vertical rods in the bearings, a wax pot connected to said rods for movement towards and from the mounting member, laterally extending hand wheels rotatable about horizontal axes mounted on the wax pot, and means comprising projections on the mounting member, and cams on said hand wheels for clamping the wax pot to the mounting member when the hand wheels are rotated.

15. Thread waxing devices for sewing machines having, in combination, a wax pot having an open top, a vertical partition integral with the wax pot forming two inter-communicating compartments of unequal size, means in the smaller compartment for guiding thread through the open top into and from the wax contained in the pot, an electrical heating element arranged beneath the pot to heat the partition directly, a second heating element arranged beneath the smaller compartment, and a thermostat for controlling the second heating element to cut it out of operation when the temperature of the wax in the pot has reached a predetermined value.

16. Thread waxing devices for sewing machines having, in combination, a wax pot having an open top, a vertical partition integral with the wax pot forming two inter-communicating compartments of unequal size, means in the smaller compartment for guiding thread through the open top into and from the wax contained in the pot, an electrical heating element arranged to heat the partition directly, and a second heating element arranged beneath the smaller compartment.

17. Thread waxing devices for sewing machines having, in combination, a wax pot, means for heating the bottom of the wax pot, thread guides within the wax pot, a plate having heat conducting contact along one edge with the bottom of the pot for supporting said thread guides, and a thermostat carried by said plate for controlling the heating means, said plate and pot being relatively movable to permit access to the guides.

18. Thread waxing devices for sewing machines having, in combination, a wax pot having an open top, means outside of the wax in the pot for heating the bottom of the wax pot, a vertical plate extending downwardly into the pot, and means for guiding thread through the wax contained in the pot, comprising separated thread guides mounted on the plate near the lower edge of the plate to cause the thread to travel in an elongated path in proximity to and parallel with the bottom of the pot, said plate and pot being relatively movable to permit access to the thread guides.

19. Thread waxing devices for sewing machines having, in combination, a wax pot having an open top, a heating element housed in the bottom of the wax pot for heating the bottom of the pot, a vertical plate extending downwardly into the pot, and means for guiding thread through the wax contained in the pot comprising separated thread guides mounted on the plate near the lower edge of the plate to cause the thread to travel in an elongated path in proximity to and parallel with the portion of the bottom of the pot in proximity to said heating element, said plate and pot being relatively movable to permit access to the thread guides.

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