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3,136,659

SKI WAXER

Filed Sept. 6, 1960

2 Sheets-Sheet 1

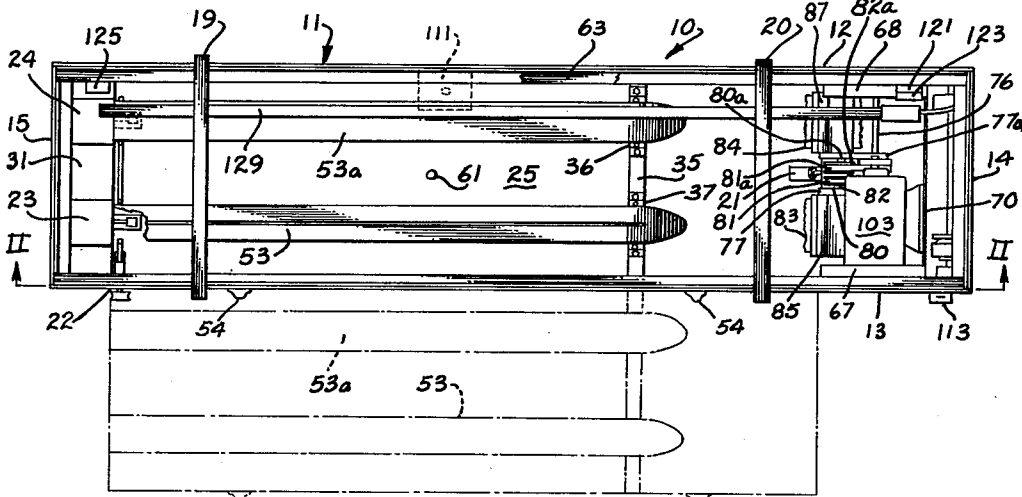


FIG. 1

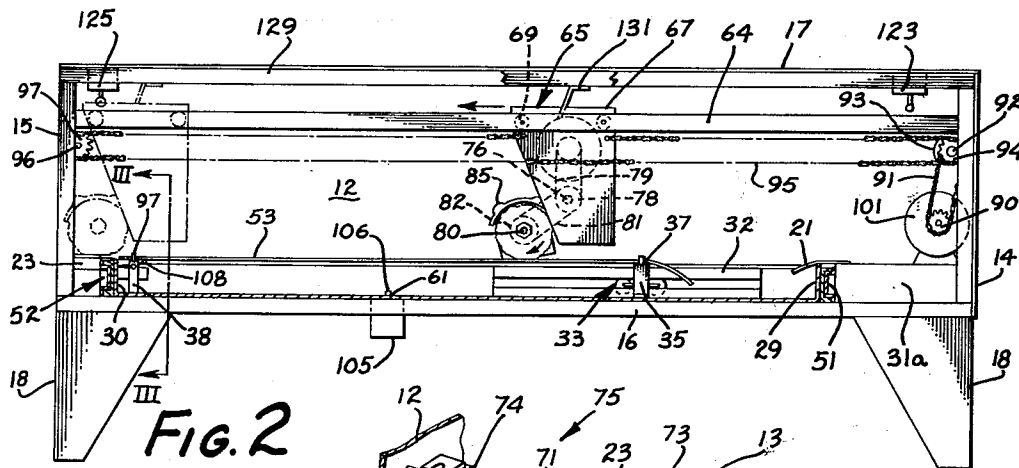


FIG. 2

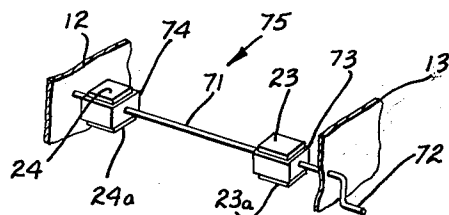


FIG. 6

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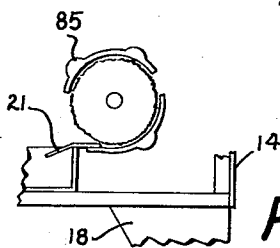


FIG. 4

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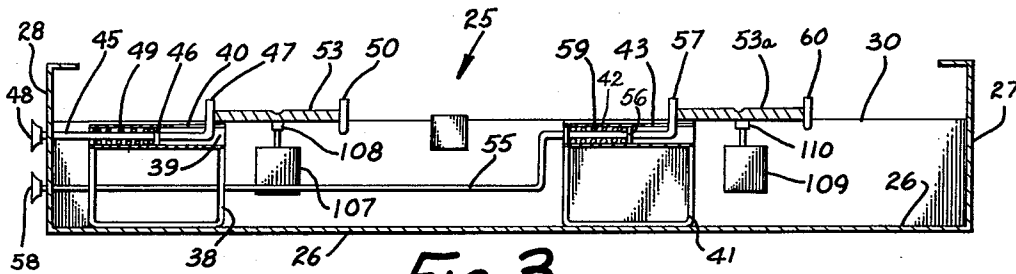


Fig. 3

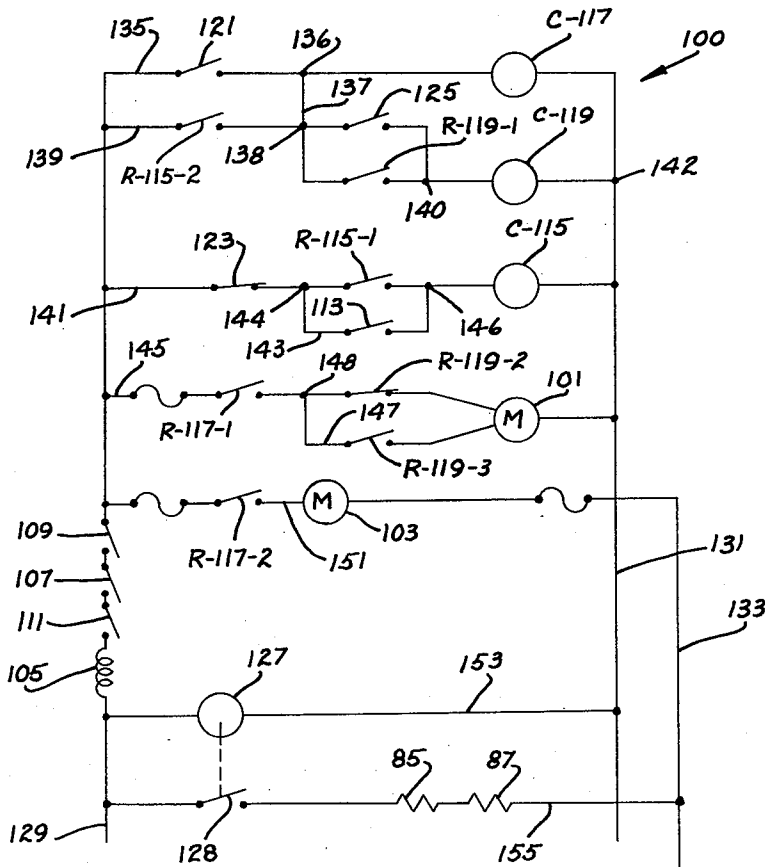


Fig. 5

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3,136,659
SKI WAXER

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21 Claims. (Cl. 118—11)

This invention relates to a ski waxer and more particularly to an automatic ski waxer.

With the growing interest in the sport of skiing, it has become necessary to provide a quick and efficient way of removing old wax from skis and applying a new coat of wax thereto. Although machines are presently available for waxing skis, they are either extremely expensive or do not operate properly. Therefore, the task of removing old wax from skis and applying a new coat is still largely performed by manual operation. Since the cost of labor is high, the manual method of waxing is not particularly desirable. Furthermore, it takes the individual waxing the skis a considerable amount of time to remove the old wax and apply a new coat. Also, the skier does not like to wait to have his skis waxed when the necessity for waxing arises. Therefore, it is obvious that a ski waxer as will be described herein is something that has long been needed in the ski waxing art.

The present invention overcomes the above-mentioned problems by providing a body which has a slidable drawer or table attached thereto. The skis are laid on the table and positioned within the body of the ski waxer. A waxing assembly is suspended from the body of the machine and includes heated waxing elements which are driven by appropriate drive means. The waxer elements are adapted to traverse the skis and in passing over the skis in one direction remove the old wax therefrom. After having removed the old wax, the waxer elements are replenished with fresh supply of wax and traverse the skis lying on the drawer in the other direction, applying a new coat of wax to the skis as the waxer moves over the skis.

The skier himself can load the ski waxer and energize the same by inserting a coin in a coin box which energizes the waxing element. Appropriate interlocks and safety switches provide means whereby the ski waxer can be operated safely even by a child. The skis can be loaded in the ski waxer and the old wax removed and a new coat of wax applied to the skis in a matter of a minute or two. Thus, there is no waiting to have the skis waxed, and the wax is applied to the skis in a more even manner than can be accomplished by hand.

It is therefore a primary object of this invention to provide a ski waxing machine which can be loaded and operated by the skier.

Another object of this invention is to provide a ski waxer having a slidable drawer which can be withdrawn from the body of the machine for loading the skis thereon and the drawer returned into the body of the machine whereby they may be worked upon by the waxing mechanism.

Still another object of this invention is to provide the drawer with safety switches and an interlock whereupon the waxing element will remain inoperative unless the skis are properly positioned upon the drawer and the drawer is properly inserted in the machine.

Another object of this invention is to provide the ski waxer with waxer pads which rotate in a direction so as to remove old wax from skis when the waxer pads are moved longitudinally over the skis.

A further object of this invention is to provide a ski waxer having rotating waxer pads which are supplied with wax on the completion of removing the old wax,

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and which pass back over the skis applying a new coat of wax thereto.

Still another object of this invention is to provide a ski waxer which has means for heating the rotating waxer pads to assist in removal of the old wax and application of the new wax to the skis.

Still another object of this invention is to provide a ski waxer wherein the waxer pads are pivotally mounted so as to apply the weight thereof to the skis to assist in removing the wax therefrom, and adapt themselves to the contoured portions of the skis.

Another object of this invention is to provide a ski waxer which has a minimum number of moving parts and is therefore economical to manufacture, operate and maintain.

Another object of this invention is to provide a ski waxer having an electrical control circuit including limit switches for reversing movement of the ski waxer element and for terminating operation thereof automatically upon completion of the operation.

These and other objects and advantages of this invention will become more obvious upon reading the following specification in conjunction with the attached drawings, wherein:

FIG. 1 is a plan view of the ski waxer showing the cover thereof removed, and the drawer in phantom withdrawn from the body of the ski waxer;

FIG. 2 shows a cross section view taken along the section lines II—II of FIG. 1;

FIG. 3 shows a cross sectional view taken along the section lines III—III of FIG. 2;

FIG. 4 shows an enlarged segmental view of the waxer pads and the heating elements associated therewith; and

FIG. 5 is a schematic diagram of the electrical control circuit for the ski waxer;

FIG. 6 is a diagrammatic perspective view showing a modified form of wax supporter.

This invention relates basically to a ski waxer which can be conditioned for waxing skis by the waxer, and upon conditioning thereof automatically removes old wax from skis and applies a new coat of wax thereto. The ski waxer has an elongated rectangular shaped body which houses the ski waxing apparatus. A drawer is slidably mounted on the bottom of the body, and can be withdrawn therefrom to facilitate supporting the skis in the machine. The drawer is provided with locating and clamping brackets for properly positioning the skis upon the drawer. Safety switches are actuated when the skis are properly placed in position on the drawer, and the drawer is properly returned to its position within the body of the ski waxer. The ski waxer is energized by inserting a coin in a box attached thereto which closes an electrical circuit which powers the ski waxer. The closing of the circuit causes an interlock to engage the drawer so that it cannot be withdrawn during the wax removal and application operation.

A carriage is suspended from the body of the ski waxer and is adapted to travel from one end of the ski waxer body to the other and return by appropriate drive means associated therewith. Pivotaly mounted on the carriage are rotating waxer pads which engage each of the skis as the carriage moves forwardly over the skis and as it returns. During the forward movement the waxer pads remove old wax from the skis. At the far end of the ski waxer body the waxer pads are provided with a fresh supply of wax and upon the return stroke applies the wax to the skis. Upon the carriage reaching the home position the electrical circuit is deenergized opening the interlock whereupon the drawer may be withdrawn and the skis removed from the drawer fully waxed and ready for skiing.

Referring now specifically to the drawings, FIG. 1

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shows the ski waxer assembly which is designated generally as 10. The assembly includes the body 11, the drawer 25, the ski waxer carriage 65 and drive mechanism associated therewith, and the electrical control circuit 100.

The body 11 is best shown in FIGS. 1 and 2. The body 11 when viewed in plan is an elongated generally rectangular shaped frame having oppositely disposed sides 12 and 13, a home end 14 and a far end 15. The sides and ends are supported at their points of connection by legs 18 (FIG. 2) which maintain the body 11 off the floor. Beams 19 and 20 are secured to the top edge of the sides 12 and 13 and are positioned inwardly from the far and home ends 15 and 14 respectively. The beams 19 and 20 provide rigidity for the body 11 and also support bus bar 129 which is positioned inwardly from the side 12 and lies parallel thereto. The purpose of the bus bar 129 will be explained more fully hereinafter.

The bottom edge of the sides 12 and 13 may also be provided with beams such as 19 and 20 to further rigidify the body 11. The bottom of the body 11 itself is otherwise substantially open.

A drawer designated generally as 25 is mounted in the bottom of the body 11. Drawer slides 51 and 52 extend transversely between the bottom edges of sides 12 and 13 and are secured thereto (FIG. 2). The side 13 is provided with an opening 22 (FIG. 1) which allows withdrawal of the drawer from the body. The drawer 25 has a bottom panel 26 and a back and face 27 and 28 respectively. The back is generally L-shaped in cross section and is secured to the bottom 26 in any well-known manner and projects in an upward direction transversely therefrom. The short leg of the L is directed inwardly over the bottom 26 and lends rigidity to the drawer. The face 28 is similar in design to the back 27 and is also secured to the bottom 26. The drawer has a home end 29 and a far end 30 which are secured to the back 27 and face 28 of the drawer 25. The back and far ends 29 and 30 are also secured to the drawer bottom 26. A portion of the drawer slides 51 and 52 are secured respectively to the drawer ends 29 and 30 to form an operative sliding drawer. A shelf 31 is secured between the sides 12 and 13 at far end 30, and supports the wax blocks 23 and 24 which are spaced inwardly from the sides. The wax blocks are aligned with waxing pads on carriage 65 to be explained more fully subsequently.

A shelf 31a is secured to the sides 12 and 13 adjacent the home end 14 which supports guide 21 (FIGS. 1 and 2). The guide is an arcuate shaped member directed downwardly and is centrally disposed between the sides 12 and 13. It is adapted to engage bracket members forming a part of the carriage 65 and guide them and the waxing pads, which also form a part of the carriage 65, over heater elements which form a part of the electric circuit 100 all of which will be explained in greater detail later.

Adjacent the home end 29 of the drawer, are two separate but cooperating pairs of tracks 32 which are secured respectively to the back 27 and face 28 on opposite sides of the drawer. A truss 35 extends between the tracks 32 (FIG. 1) and has track rollers 33 (FIG. 2) on each end which travel in the two pairs of tracks 32. The truss 35 carries ski rests 36 and 37 which are adapted to receive the front portion of the skis 53. The truss 35 is freely positionable with respect to the longitudinal extent of the body 11, since the track rollers 33 secured thereto are allowed to roll within the tracks 32. The purpose of this is to properly support skis of varying lengths. The ski rests 36 and 37 are cradle-shaped and prevent transverse movement of the skis 53 when positioned within the rests.

At the far end of the drawer 25 clamp support brackets 38 and 41 (FIG. 3) are secured to the drawer bottom 26, and are spaced inwardly from the drawer back and face. The clamp support bracket 38 is generally U-shaped as viewed in FIG. 3, and has a tubular clamp guide 39

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secured to the top thereof. The clamp guide 39 has an open end and a closed end. The slot 40 is formed in the clamp guide 39 and extends from the open end thereof approximately a third of the way along the clamp guide.

A first actuator rod 45 extends through an aperture formed in the drawer face 28, an aperture formed in the closed end of the clamp guide 39 and into the clamp guide 39. The end of the first actuator rod 45 is bent upwardly to form a flange or clamp element 47 which projects above the clamp guide 39 and is directed by the slot 40 formed therein. The first actuator rod 45 has a shoulder 46 formed thereon which is in sliding engagement with the interior of the clamp guide 39. A compression spring 49 is positioned between the shoulder 46 and the closed end of the clamp guide 39. Thus, when the spring 49 attempts to expand, the flange portion 47 tends to move toward the right as viewed in FIG. 3.

A stop 50 is secured to the drawer end 30 and projects thereabout. The stop 50 is spaced from the flange 47 a sufficient distance to allow the width dimension of the ski 53 to be positioned therebetween. The end of the actuating rod 45 outside the drawer face 28 is provided with a knob 48 for drawing the rod against the spring 49. Thus, the actuator rod 45 can be withdrawn to allow placement of the ski 53 between the stop 50 and the flange 47, and when released the flange 47 will clamp the ski between the stop 50 and itself.

The clamp support bracket 41 is similar in design to the clamp support bracket 38. It has a tubular shaped clamp guide 42 secured to the top thereof which has an open end and a closed end. A slot 43 is formed in the top of the clamp guide 42 from the open end thereof and extends approximately a third of the distance into the clamp guide. A second actuator rod 55 is positioned below the first actuator rod 45, and to the side. It passes through another aperture formed in the drawer face 28, makes an S-shaped bend and continues through the closed end of the clamp guide 42. The end of the second actuator rod 55 is bent upwardly to form a flange or clamp element 57 which projects above the clamp guide 42 and is directed in movement by the slot 43 formed therein. The second actuator rod 55 has a shoulder 56 formed integral therewith which slides within the interior of the clamp guide 42. A compression spring 59 is positioned between the shoulder 56 and the closed end of the clamp guide 42. A spring 59 urges the flange 57 toward the back of the drawer as viewed in FIG. 3. The end of the second actuator rod 55 which projects beyond the face 28 of the drawer is provided with a knob 58 for drawing the shoulder 56 against the spring 59 and moving the flange 57 toward the face 28.

A stop 60 is secured to the back 30 and is spaced from the flange 57 a sufficient distance so that when the flange 57 is withdrawn the other ski 53a may be positioned between the stop 60 and the flange 57. Upon release of the actuator rod 55 the spring 59 will urge the flange 57 toward the back of the drawer and clamp the ski 53a between the flange 57 and stop 60.

A safety switch 107 is secured to the far end 30 of the drawer and is positioned so as to be associated with the ski 53. The safety switch 107 has an actuator 108 which is depressed by the ski 53 when it is properly positioned between the stop 50 and flange 47. A similar safety switch 109 is secured to the far end 30 of the drawer and is associated with the ski 53a. The safety switch 109 has an actuator 110 which is actuated when the ski 53a is properly positioned between stops 60 and flange 57. The purposes of the safety switches 107 and 109 will be explained in greater detail subsequently. The back portions of the skis 53 and 53a rest upon the top edge of the drawer far end 30.

Thus, the back end or trailing end of the skis 53 and 53a are supported by the far end of the drawer 30 and

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the front end of the skis are supported by the ski rests 36 and 37 secured to the beam 35. The ski rests 36 and 37 are each in alignment with one of the ski rests at the far end of the drawer so that when the skis are placed in the drawer they assume a position parallel to body sides 12 and 13. An interlock aperture 61 is centrally located in the drawer bottom 26. A pin from the interlock projects into the interlock aperture 61 and prevents withdrawal of the drawer under circumstances which will be described more fully hereinafter.

Handles 54 are secured to the drawer face 28 and are grasped to withdraw the drawer from the wax skier body 11. As shown in phantom in FIG. 1, the drawer is withdrawn at which time the front portion of the ski 53 can be placed in the ski rest 37 and the back portion of the ski positioned between the stop 50 and the flange 47 by withdrawing the first actuator rod 45. Upon release of the first actuator rod 45 the ski is properly positioned on the drawer. The ski 53a is placed on the rest 36 and clamped between the stop 60 and flange 57 by withdrawing the second actuator rod 55 and releasing the same when the ski is in position. The drawer 25 is then returned to its position within the ski waxer body 11 as shown in the solid line position in FIG. 1.

The body sides 12 and 13 are provided with rails 63 and 64 respectively. The rails are adjacent the top edges of the sides and positioned opposite each other. The rails 63 and 64 support the ski waxer carriage designated generally as 65.

The ski waxer carriage 65 includes a pair of suspension brackets 67 and 68. The suspension bracket 68 has rollers 69 (FIG. 2) which engage the rails 64. The suspension bracket 67 has similar rollers which engage the rail 63. The suspension brackets 67 and 68 are connected together by a tie beam 70 (FIG. 1). Thus, the carriage 65 can move along the body 11 of the ski waxer due to the rollers 69 which engage the rails 63 and 64.

Also extending between the suspension brackets 67 and 68 is the support shaft 76 (FIG. 2) the support shaft 76 cooperates with the tie beam 70 in spacing the suspension brackets 67 and 68, and lends added rigidity to the carriage 65.

The support shaft 76 performs other useful functions one of which is to support L-shaped journal brackets 77 and 77a (FIG. 1) which are pivotally mounted thereupon. The support shaft 76 also supports a multiple groove sheave 78 which is journaled upon the shaft 76 between the legs of the L-shaped journal brackets 77 and 77a.

Rotatably mounted in bearings formed in the L-shaped journal bracket 77 is a buffer shaft 80 (FIG. 1). The buffer shaft 80 extends from the side of the L-shaped journal bracket 77 toward the body side 13, and the extending end supports waxer pads 83. Similarly a buffer shaft 80a is journaled in L-shaped journal bracket 77a and extends from the side thereof toward body side 12. The extending ends support waxer pads 84. The waxer pads 83 and 84 are composed of a series of disks formed from a material such as cotton or wool which are sandwiched together on the ends of the buffer shafts. A pulley 82 is fixed to the buffer shaft 80 as is a pulley 82a to the end of shaft 80a, and the grooves thereof are in alignment with grooves of the multiple groove sheave 78. Endless drive belts 81 and 81a are trained over the pulleys 82, 82a and the sheave 78. Although not shown, it is sometimes necessary to provide stop means on the suspension brackets 67 and 68 which are positioned to engage the L journal brackets 77 and 77a to prevent excessive downward pivotal movement about the support shaft 76.

A waxer pad drive motor 103 is secured to the tie beam 70 of the carriage 65. The drive belt 79 transmits power from the motor 103 to the sheave 78. This power is then transmitted to the buffer shaft 80 and buffer pads 83 and 84 by the belts 81. A pickup finger 131 (FIG. 2)

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engages the bus bar 129. The bus bar 129 is hot, and the motor 103 is supplied therefrom throughout the forward and the reverse movement of the carriage 65 via the pickup 131.

FIG. 1 shows heater elements 85 and 87 which are associated with each of the waxer pads 83 and 84 respectively. The heater elements are cast from aluminum to provide for maximum heat transfer. FIG. 4 shows an enlarged side elevational view of the heater elements. The heater element 85 has an upper element which may be secured to the support shaft 76 or to the suspension bracket 67. The upper half of the heater element 85 surrounds approximately one-half the circumference of the waxer pad 83. The upper portion of heater element 87 is similar in design to that of the upper portion of heater element 85 and is secured to the suspension bracket 68 or the support shaft 76. The lower portion of heater element 85 is fixed to the side 13 or a cross member between the sides 12 and 13. The lower portion of heater element 87 is fixed to the side 12 or a cross member between the sides 12 and 13 and is in alignment with the lower portion of heater element 85. When the carriage 65 is in the home position, the waxer pads 83 and 84 seat within the lower portions of heater elements 85 and 87 which surrounds approximately one third of the remaining circumference of the waxer pads not encompassed by the upper portions of the heater elements 85 and 87 travel with the carriage during the waxed removal and application operation; however, the lower portions of the heater elements remain fixed to the ski waxer body 11. The upper heater elements are supplied with current for heating purposes by a pickup (not shown) also in contact with the bus bar 129. The purpose of the heater elements will be explained more fully hereinafter.

The carriage drive motor 101 is fixed to the ski waxer body 11 adjacent the home end 14 thereof. The carriage drive motor 101 has a drive sprocket 90 over which is trained a drive chain 91. The drive chain 91 is also trained over a sprocket 93 which is fixed to a home drive shaft 92 journaled in appropriate bearings (not shown) fixed on the sides 12 and 13. The home drive shaft 92 also has a sprocket 94 fixed thereto and positioned so as to be in alignment with the suspension bracket 67.

An idler shaft 96 is positioned at the far end of the ski waxer body 11 and is journaled in appropriate bearings (not shown) secured to the sides 12 and 13. The idler shaft 96 has an idler sprocket 97 secured thereto and positioned so as to be in alignment with the suspension bracket 67.

A carriage drive chain 95 has one end thereof secured to the carriage 65 and is entrained over the sprocket 94 and over the idler sprocket 97 and has the opposite end thereof secured to the ski waxer carriage 65. Thus, upon rotation of the drive sprocket 90 by motor 101, power is transmitted to the home drive shaft 92 which in turn rotates the carriage drive sprocket 94 and the carriage drive train 95. Thus, depending upon the direction of rotation of the motor 101 the ski waxer carriage 65 is caused to travel along the rails 63 and 64 in either a forward or reverse direction. Although not shown, it is to be understood that a carriage drive chain such as 95 may also be connected to the suspension bracket 68 in a manner similar to the attachment of the drive chain 95 to the suspension bracket 67. This arrangement is preferred since it provides for a more even movement of the carriage 65. Home limit switches 121 and 123 (FIGS. 1 and 2) are located side by side adjacent the home end 14 of the body and adjacent the top edge of side 12. As shown in FIG. 2, the switches have actuators which are positioned in the path of travel of the carriage 65 and is actuated thereby. Reverse limit switch 125 is located adjacent the far end 15 and along the top edge of side 12. It also has an actuator disposed in the path of carriage 65 and is actuated thereby.

The movement of the ski waxer carriage 65 and the

rotation of the waxer pads 83 and 84 are controlled by the electrical circuit 100 (FIG. 5) now to be described.

A pair of lead lines 129 and 131 having a potential of 115 volts thereacross feed the majority of components of the electrical circuit. However, certain elements of the circuit are fed by the feed lines 129 and 133 which have a 230 volt potential thereacross.

A timer motor 127 is connected in line 153 which is in turn connected to the lead lines 129 and 131. The timer motor 127 runs continuously and at a predetermined time mechanically closes a switch 128 in line 155 which is connected across feed lines 129 and 133. The line 155 has connected therein heaters 85 and 87. Thus, when the switch 128 is closed, the heaters 85 and 87 will be in operation.

Connected in series with the feed line 129 is a solenoid operated interlock 105, also shown in FIG. 2, having a lock pin 106 which enters the lock pin aperture 61 of the drawer 25 when actuated and the drawer is in the closed position preventing withdrawal thereof. Safety switch 111 is in series with solenoid lock 105 and must be closed before the solenoid lock 105 is rendered operative. The safety switch 111 is shown in FIG. 1 and is closed by the drawer back 27 when the drawer 25 is fully inserted in the body 11.

Ski safety switches 107 and 109 (FIGS. 3 and 5) are also located in series in the feed line 129. The actuators 108 and 110 of the ski safety switches 107 and 109 respectively must be closed before the remainder of the circuit can be energized.

Thus, the ski safety switches 107 and 109, and the drawer safety switch 111 must all be closed before a circuit can be completed to the other elements of the circuit.

A line 141 is connected across the lines 129 and 131 and contains a normally closed home limit switch 123 (FIGS. 1 and 5), normally open relay contacts R-115-1 and solenoid relay coil C-115. A coin operated switch 113 is connected in a bypass line 143 which connects to a junction 144 between the home limit switch 123 and relay contact R-115-1 and to connection point 146 which is positioned between relay coil C-115 and relay contacts R-115-1.

The line 135 is connected between feed lines 129 and 131 and contains normally open home limit switch 121, and motor solenoid relay coil C-117.

Line 137 taps line 135 at connection point 136 between limit switch 125 and motor solenoid relay coil C-117 and connects with feed line 131 at connection point 142. Line 137 indicates relay contacts R-119-1 and solenoid relay coil C-119.

Line 139 is connected to feed line 129 and to line 137 at junction points 138 and 140. Line 139 contains normally open relay contacts R-115-2 in series with normally open reverse limit switch 125 (FIGS. 1 and 5).

Line 145 is connected between feed lines 129 and 131. This line contains in series normally open motor relay contacts R-117-1, normally closed relay contacts R-119-2 and carriage drive motor 101. A bypass line 147 is connected at attachment point 148 and to the carriage drive motor 101. Line 147 contains normally open relay contacts R-119-3.

Line 151 is connected across feed lines 129 and 133. Line 159 includes in series normally open relay contact R-117-2, waxer pad drive motor 103, and normally open relay contacts R-117-3.

The operation of the components of the electrical circuit will now be described in conjunction with a description of the operation of the ski waxer.

Operation

In the description of the operation it will be assumed that the timer motor 127 has closed the timer switch 128 thereby completing a circuit through line 155 and energizing the heaters 85 and 87. The timer motor 127 can

be set, for example, to close the switch 128 at say 10 a.m. and to open the switch 128 at say 5 p.m. Thus, the heaters are energized during the hours of the day in which it would be probable for a skier to be using the ski waxer assembly 10.

When the skier desires to wax his skis, he grasps the handles 54 of the drawer 25 and withdraws the drawer from the body 11 of the ski waxer so that it assumes the position as shown in phantom in FIG. 1. The leading edge of the ski 53a is placed on the ski rest 36 face down so that the runner portion of the ski is facing upwardly or exposed. The skier then grasps the knob 58 and withdraws the flange 57 against the compression of the spring 59. This allows the trailing edge of the ski to be positioned between the stop 60 and the flange 57. The ski 53a is pressed into position upon the far end 30 of the drawer and the knob 58 released. The spring 59 will then urge the flange 57 against the ski and clamp the ski into position between the stop 60 and flange 57. As the ski 53a is placed into position, ski safety switch actuator 110 will be engaged by the ski and will close the contacts of ski safety switch 109. Ski 53 is then placed in position by placing the leading edge of the ski on front ski rest 37 and the trailing edge between stop 50 and flange 47 by grasping knob 48 and withdrawing the flange 47 against the compression of the spring 49. When the knob 48 is released the ski will be clamped between stop 50 and flange 47. If ski 53 is properly placed in position ski safety switch actuator 108 will be engaged and close ski safety switch 107.

Since the front ski rests 36 and 37 are mounted on the beam 35 which is adjustable with respect to the longitudinal extent of the ski waxer, the skis will automatically adjust the beam 35 to the right position when the leading edge of the skis are placed thereon and the trailing edge of the skis is properly positioned upon the clamping devices.

The skis are now in proper position upon the drawer or table 25, and the drawer is pushed back into the body 11 of the ski waxer until it assumes the solid line position shown in FIG. 1. When the drawer is properly positioned in the body 11, the drawer back 127 will actuate and close drawer safety switch 111. Thus, safety switches 107, 109, and 111 (FIG. 5) located in feed line 129, are now all closed.

The skier then inserts a coin in the coin switch 113 (FIGS. 1 and 5) thereby closing the coin switch contacts 113 in line 143. Since home limit switch 123 is normally closed a circuit is completed through feed line 129, line 141, line 143 and feed line 131. Completion of this circuit energizes solenoid interlock 105 and moves locking pin 106 into the lock aperture 61 in the bottom 26 of drawer 25. As long as the solenoid lock remains energized, the drawer 25 cannot be withdrawn from the ski waxer body 11 due to the interlock. This prevents the skier from inadvertently withdrawing the drawer of the ski waxing apparatus while it is in operation.

Completion of this circuit also energizes the solenoid relay coil C-115 which closes its relay contacts R-115-1, line 141 and locks the circuit in. Relay contacts R-115-2 (line 139) are also closed and a circuit is completed to motor solenoid relay coil C-117 (line 135).

When motor solenoid coil C-117 is energized, it closes relay contacts R-117-1 (line 145) and relay contacts R-117-2 (line 151). This completes a circuit to the forward windings of carriage drive motor 101 since relay contacts R-119-2 are normally closed, and a circuit to the buffer pads drive motor 103. Since the carriage drive motor is now driven, the carriage 65 will start to leave home end 14 of the ski waxer assembly 10.

As carriage 65 leaves home end 14, it closes normally open home limit switch 121 (FIGS. 1 and 5) and open normally closed home limit switch 123. The closing of home limit switch 121 completes a circuit through line 135 so as to hold in motor solenoid relay coil C-117 and

thereby the forward winding of carriage drive motor 101 and waxer pad drive motor 103. Opening of home limit switch 123 drops out the solenoid relay coil C-115 (line 141) and its relay contacts R-115-1 (same line) and solenoid relay contacts R-115-2 (line 139).

As previously described, the L-shaped journal brackets 77 and 77a are pivotally mounted on the support shaft 76 of carriage 65. Thus, as the carriage 65 moves in the forward direction, the waxer pads 83 and 84 carried by the L-shaped journal brackets 77 and 77a will pivot downwardly under their own weight as the journal bracket leaves the guide 21. The carriage 65 is moving in the direction of the arrow (FIG. 2) and the waxer pads 83 and 85 are rotating in the direction of the arrow (FIG. 2) which is in a direction against the line of travel of the carriage. As the carriage travels along, the waxer pads 83 and 84 will engage the turned up portions of the leading edges of the skis 53 and 53a and follow the contour of the runner portions of the skis which is possible due to the pivotal mounting of the waxer pads.

The pivotal mounting of the waxer pads 83 and 84 allow the weight of the waxer pads 83 and 84, the shafts 80 and 80a, and L-shaped journal brackets 77 and 77a to be applied to the skis. This, in conjunction with the fact that the waxer pads are rotating in a direction against the direction of travel of the carriage 65, effectively removes old wax from the runners of the skis 53 and 53a.

The carriage 65 continues to move toward the far end 15 of the ski waxer assembly 10 until the waxer pads 83 and 84 have passed over the entire length of the skis 53 and 53a. At this point carriage 65 engages reverse limit switch actuator 126 of reverse limit switch 125 (FIGS. 2 and 5) thereby completing a circuit to solenoid relay coil C-119, via lines 135 and 137. Energization of solenoid relay coil C-119 closes its relay contacts R-119-1 (line 137), opens normally closed relay contacts R-119-2 (line 145), and closes normally opened relay contacts R-119-3 (line 147). The closing of relay contacts R-119-1 locks in solenoid relay coil C-119. The opening of normally closed relay contacts R-119-2 opens the circuit to the forward windings of carriage drive motor 101 and the closing of relay contacts R-119-3 completes a circuit to the reverse windings of carriage drive motor 101. Since the carriage drive motor 101 has been reversed, the carriage 65 will begin movement in the reverse direction.

However, during the interval in which the above-mentioned reversing operation is taking place, the waxer pads 83 and 84 will be positioned over the wax blocks 23 and 24 positioned at the far end of the ski waxer assembly. Since the waxer pads 83 and 84 continue to rotate during the reversing interval, they will supply themselves with wax from the wax blocks due to their weight resting thereupon and the continuous rotation. It should also be noted that the heater elements 85 and 87 traveling with the carriage 65 are energized during this interval and assist in removing the old wax and picking up a fresh supply of new wax from the wax blocks 23 and 24.

As the carriage 65 moves in the reverse direction, the waxer pads 83 and 84 continue to rotate in the same direction as previously. However, the direction of rotation is now so as to travel with the carriage 65 rather than against it. Thus, the wax pads lay a new coat of wax on the ski runners. This is true because the waxer pads are working with the carriage 65 rather than against it. The carriage 65 then continues in the reverse direction until the waxer pads 83 and 84 have passed back over the entire length of the skis, following any variation in the contour of the ski runners due to their pivotal mounting. As the carriage 65 approaches the home end 14, the L-shaped journal brackets 77 and 77a will engage guide 21 (FIG. 1) and lift the waxer pads 83 and 84 into the proper position in the lower portions of the heater elements 85 and 87.

Simultaneously the carriage 65 engages the actuators

of home limit switches 121 and 123. The opening of limit switch 121 drops out motor solenoid relay coil C-117 which drops out its relay contacts R-117-1 (line 145) and R-117-2 (line 151) thereby breaking the circuits to both the carriage drive motor 101 and waxer pad drive motor 103. This also drops out solenoid relay coil C-119 and returns its relay contacts R-119-2 to the normally open position thereby setting up the circuits so that the carriage 65 will move in the forward direction when a new coin is inserted in coin switch 113. The closing of home limit switch 123 also sets up line 141 for a new waxing cycle.

Since the circuit is now open to solenoid interlock 105, a spring (not shown) draws interlock pin 106 from interlock aperture 161 in the drawer bottom 26. The skier can then withdraw the drawer 25 and remove the skis 53 and 53a. The drawer can be returned to its normal position within the ski waxer assembly 10 or if another skier is waiting to have his skis waxed, the drawer can again be loaded before pushing it into the ski waxer assembly 10.

The entire above-mentioned series of events takes place in a matter of a minute or two. This is only a fraction of the time previously necessary to wax skis if performed manually. The safety switches associated with the electrical circuit assure that the skis are in proper position to be operated upon the ski waxing mechanism before the circuit is energized. Proper positioning results in the proper removal of the old wax from the ski runners and the proper application of the new is further enhanced by the fact that the waxer pads move against the direction of travel of the carriage when the wax is being removed, and moves with the direction of movement of the carriage when the wax is being applied. The solenoid interlock prevents withdrawal of the drawer while the ski waxing mechanism is in operation. This prevents the possibility of injury to the skis by an inadvertent withdrawal of the drawer, and also prevents the possibility of injury to the skier since the waxing mechanism is completely enclosed during the ski waxing interval. It is virtually impossible to injure the skis by the waxing mechanism since the device will not operate unless the skis are properly positioned upon the drawer. The device is extremely simple to operate and can be used by even a young skier without fear of injury. The removal and application of the wax is completely automatic once the ski waxer assembly has been properly loaded. The ski waxing assembly does not require an operator, since the skier himself can operate the device. Since the waxer pads are heated, the ski waxer assembly can be placed in shelter having temperatures which would commonly occur in skiing areas and yet do a first rate job of removing and applying wax. Since the waxer pads are mounted in the journal bracket which is pivotally mounted on the carriage, the weight of these components are applied to the skis during removal and application of the wax which results in a better job of removal and more even application of new wax to the skis.

Modification

FIG. 6 shows a diagrammatic view of a modified form of wax block supporter and is designated generally as 75. The wax supporter 75 may be used in place of the shelf 31 for supporting wax blocks.

The wax block supporter 75 includes a shaft 71 which is journaled in the sides 12 and 13. The one end of the shaft 71 is formed in the shape of a crank or handle 72 for purposes which will be explained more fully hereinafter. Wax block holders 73 and 74 are fixed to the shaft 71 in any well-known manner. The wax block holders 73 and 74 are spaced endwardly from the sides 13 and 12 respectively so as to be in direct alignment with the waxer pads 83 and 84 respectively.

The wax block holders 73 and 74 are cube like in design having opposed parallel surfaces. These surfaces support the wax blocks. As clearly shown in FIG. 6, the

wax blocks 23 and 24 are fixed in any well-known manner to one of the surfaces of the wax block holders 73 and 74, and the wax blocks 23A and 24A are fixed to the opposite surfaces.

The wax blocks 23 and 24 have have different chemical properties than do the wax blocks 23A and 24A. The purpose for this is that different skiing conditions require different types of wax on the skis. For purposes of illustration, if the snow is powdery snow the skis should be waxed with the wax blocks 23 and 24; however, if the snow is sugary snow the skis should be waxed with the ski blocks 23A and 24A.

With the ski supporter 75 this can be easily accomplished by merely rotating the crank 72. A half turn of the crank will position the desired type of wax in place to be engaged by the waxer pads. The supporter like the remainder of the ski waxer can be operated by the skier.

Latch means (not shown) engages the handle 72 or shaft 71 to maintain one of the sets of wax blocks in the upright position. Indicia may be placed on the side 13 stating which type of wax is in position to be engaged by the waxer pads. Although not shown, it is to be understood that within the broadest aspect of the invention the wax block holders 73 and 74 may be made in the form of a square cube such that four different types of wax may be placed on the sides of the holders.

While a preferred embodiment of this invention and a modification thereof has been described, it will be understood that other modifications and improvements may be made thereto. Such of these modifications and improvements as incorporate the principles of this invention are to be considered as include in the hereinafter appended claims.

We claim:

1. Mechanism for removing and applying wax to skis comprising: a body, means for supporting said skis in said body, carriage means movably supported by said body and constructed to traverse said body from one end to the other and then to reverse and return to said one end; waxing means carried by said carriage, drive means for said carriage and said waxing means, heater means for said waxing means, and wax supply means arranged to be supplied to said waxing means after movement in one direction, movement of said heated waxing means in one direction removes wax from said skis, then causes wax to be supplied to said waxing means and then movement of said waxing means in the opposite direction applies wax to said skis.

2. Mechanism for removing and applying wax to skis comprising: a body, means for supporting said skis in said body, rotatable waxing means and means to support said waxing means in said body; carriage means adapted to cause lengthwise movement between said waxing means and said skis, wax supply means supplying wax to said waxing means after movement of said waxing means in one direction, heater means for said waxing means, and means for rotating said waxing means in a constant direction, said carriage means being reciprocable and reversible for movement first in one direction and then in the opposite direction, whereby movement against rotation of said waxing means causes removal of old wax and movement with rotation of said waxing means causes application of wax.

3. Mechanism for removing and applying wax to skis comprising: a body, means for supporting said skis in said body, rotatable heated waxing means adapted to be moved back and forth lengthwise across the skis, means for rotating said waxing means in a constant direction whereby movement against rotation causes removal of old wax and movement with rotation causes application of wax; and wax supply means for supplying said waxing means with wax before movement of said waxing means with the direction of rotation.

4. Mechanism for removing and applying wax to skis

comprising: a body; means for supporting skis in said body, carriage means movably supported by said body, waxing means carried by said carriage and including rotating waxer pads pivotally suspended therefrom, drive means for rotating said waxer pads in a constant direction, carriage drive means for moving said carriage forwardly over said skis, said waxer pads each engaging a ski when said carriage is moved in the forward direction and being pivoted when coming in contact therewith applying the weight of said waxer pads to the ski, heating means to soften old wax on the skis, said waxer pads rotating against the direction of movement of said carriage for removal of wax from said skis, wax supply means located at the end of the forward movement of said carriage and being engaged by said waxer pads supplying them with wax, means for reversing said carriage drive means, said waxer pads engaging said skis on reverse movement and applying a coat of wax thereto, said waxer pads rotating with the direction of movement of said carriage for application of wax to said skis.

5. Mechanism for removing and applying wax to skis comprising: a body, means for supporting said skis in said body, rotatable wax applicator means associated with said body and adapted to move with respect to said ski supporting means to traverse the skis, reversible, reciprocable carriage means between said body and said wax applicator means and mounted to cause reversible, reciprocable movement therebetween first in one direction and then in the reverse direction means for rotating said waxing means, means for heating said ski waxing means, and wax supply means positioned to engage said waxing means after movement between said waxing means and the skis in one direction and before reverse movement, so that movement in one direction causes removal of old wax from the skis by said heated waxing means, and movement in the opposite direction causes application of the wax from the wax supply means.

6. Mechanism for removing and applying wax to skis comprising: a body, means for supporting said skis in said body, carriage means movably supported by said body and constructed to traverse said body from one end to the other; waxing means carried by said carriage, drive means for said carriage and said waxing means; wax supply means positioned to supply wax to said waxing means after movement in one direction wherein movement of said waxing means in one direction removes wax from said skis and movement of said waxing means in the opposite direction applies wax to said skis; and heating means for heating said waxing means.

7. Mechanism for removing and applying wax to skis comprising: a body, means for supporting said skis in said body, carriage means movably supported by said body and constructed to traverse said body from one end to the other; waxing means carried by said carriage, drive means for said carriage and said waxing means wherein movement of said waxing means in one direction removes wax from said skis and movement of said waxing means in the opposite direction applies wax to said skis; wax supply means adapted to supply wax to said waxing means after movement in one direction of said waxing means heating means for heating said waxing means; said heating means including an upper and lower unit, said lower unit being fixed to said body and surrounding a portion of said waxing means when said waxing means is in its rest position, said upper unit being secured to said waxing means and surrounding a portion thereof at all times.

8. A device for waxing skis comprising: an elongated body; means for supporting skis mounted in the body including a drawer capable of being withdrawn from said body for loading and unloading said skis, ski waxing means supported by said body and constructed and arranged to move from a home end of the body to a far end of the body and return to the home end, said ski waxing means engaging said skis during forward movement of said waxing means for removing old wax from said skis and applying new wax to said skis upon return

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movement; electrical circuit means for controlling the movement of said waxing means, and heating means to soften the wax.

9. A device for waxing skis comprising: an elongated body; means for supporting skis mounted in the body including a drawer capable of being withdrawn from said body for loading and unloading said skis, heated ski waxing means supported by said body and constructed and arranged to move from a home end of the body to a far end of the body and return to the home end, said ski waxing means engaging said skis during forward movement of said waxing means and removing old wax from said skis and applying new wax to said skis upon return movement, wax supply means at said far end; electrical circuit means for controlling the movement of said waxing means; said electrical circuit means including an interlock between said drawer and said body for preventing withdrawal of said drawer when said ski waxing means is in operation.

10. A device for waxing skis as in claim 8 wherein said electrical circuit means includes a safety switch associated with each ski, and a safety switch associated with said drawer; actuation of each of said safety switches being necessary before said electrical circuit means is energized.

11. A device for waxing skis as in claim 8 wherein said electrical circuit means is energized by a coin operated switch, actuation of said coin operated switch energizing an interlock member to engage said drawer and prevent withdrawal thereof during the operation of said waxing means.

12. A device for waxing skis comprising: an elongated body; means for supporting skis mounted in the body including a drawer capable of being withdrawn from said body for loading and unloading said skis, ski waxing means supported by said body and constructed and movably suspended in said body to move from a home end of the body to a far end of the body and return to the home end, drive means operably connected with said ski waxing means to move said ski waxing means from said home end to said far end and then to reverse the movement to return said ski waxing means at home end wax supply means at said far end, heater means for said waxing means, said ski waxing means engaging said skis during forward movement of said waxing means and removing old wax from said skis and applying new wax to said skis upon return movement after being supplied with wax from said wax supply means, electrical circuit means for controlling the movement of said waxing means; said electrical circuit means including a coin operated switch means for energizing said electrical circuit means and drive means for said waxing means, movement of said waxing means closing a first home limit switch means keeping said drive means energized and opening a second home limit switch means de-energizing said coin operated switch means, reverse limit switch means reversing said drive means upon actuation thereof, closing of said first home limit switch upon return of said waxing means de-energizing said drive means.

13. A device for waxing skis comprising: an elongated body; means for supporting skis mounted in the body including a drawer capable of being withdrawn from said body for loading and unloading said skis, heated ski waxing means supported by said body and constructed and arranged to move from a home end of the body to a far end of the body and return to the home end, wax supply means at said far end, said ski waxing means engaging said skis during forward movement of said waxing means and removing old wax from said skis and applying new wax to said skis upon return movement, electrical circuit means for controlling the movement of said waxing means, said waxing means including a carriage means and rotating waxing means, a first drive means for said carriage and a second drive means for said waxing means; said electrical circuit means including a coin operated switch

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for energizing said first and second drive means and causing movement of said carriage means and rotation of waxing means, movement of said carriage means closing a first home limit switch and keeping said first and second drive means energized and opening a second home limit switch de-energizing said coin operated switch; a reverse limit switch at the far end of said body being closed upon contact with said carriage means and reversing said first drive means, opening of said first home limit switch means upon return of said carriage, de-energizing said first and second drive means.

14. A device for waxing skis comprising: an elongated body; means for supporting skis mounted in the body including a drawer capable of being withdrawn from said body for loading and unloading said skis, said drawer having releasable clamps for maintaining the trailing edge of the skis in position, support mechanism for supporting the leading edge of the skis and being movable along the body to support different lengths of skis; ski waxing means supported by said body and constructed and suspended in said body to move from a home end of the body to a far end of the body and return to the home end, drive means operably engaged with said ski waxing means to move said ski waxing means first in one direction from said home end to said far end and then to reverse the movement to return said ski waxing means from said far end to said home end, heater means adjacent said ski waxing means, wax supply means adapted to supply wax to said ski waxing means after movement of said ski waxing means in one direction and before return movement, said heated ski waxing means engaging said skis during forward movement of said waxing means and removing old wax from said skis and applying new wax to said skis upon return movement, and electrical circuit means for controlling the movement of said waxing means.

15. Mechanism for applying wax to skis comprising: a body, means for supporting said skis in said body, rotatable wax applicator means, wax supply means for said wax applicator means, means for rotating said wax applicator means, reversible, reciprocable carriage means and drive means therefor mounted on said body and operably engaged with said carriage means to drive said carriage means first in one direction and then to reverse the movement to return said carriage means in the opposite direction, means suspending said wax applicator means from said carriage means to cause said wax applicator means to move with said carriage means; heater means adjacent said wax applicator means, said wax applicator resting on said skis while waxing whereby the wax applicator follows the contour of the skis and applies a uniform pressure thereto, and said wax supply means positioned at one end of the supported skis, causing said wax applicator means to contact said wax supply means only after movement in one direction on the skis during which the old wax is removed and prior to movement in the opposite direction for applying the new wax.

16. Mechanism for applying wax to skis comprising: a body, means for supporting said skis in said body, rotatable wax applicator means, means for rotating said wax applicator means, wax supply means for said wax applicator means, reciprocable, reversible carriage means and drive means therefor mounted on said body to move said carriage means first in one direction and then to reverse the movement to return the carriage means in the opposite direction, means suspending said wax applicator means from said carriage to move said wax applicator with said carriage means; said wax applicator means resting on said skis while waxing whereby the wax applicator means follows the contour of the skis and applies a uniform pressure thereto, heating means for heating said wax applicator, and said wax supply means being positioned at one end of the ski supporting means and the skis thereon to enable engagement of said wax applicator means with said wax supply means only after said wax applicator means moves in one direction and before the reverse movement.

17. Mechanism for applying wax to skis comprising: a body, means for supporting said skis in said body, rotatable wax applicator means, drive means for rotating said wax applicator, reciprocable, reversible carriage means and drive means therefor mounted on said body and operably engaged with said carriage means to move said carriage means first in one direction and then to reverse the movement to return it in the opposite direction, means suspending said wax applicator means from said carriage means; heater means for said wax applicator means, said suspension means including a pair of brackets independently pivotally mounted on said carriage, said wax applicator including waxer pads journaled on said brackets, each of said waxer pads engaging a ski on said supporting means and resting thereon while said carriage means transverses said skis, wax supply means for said wax applicator means, positioned adjacent one end of said ski supporting means and the skis thereon to enable said waxer pads to engage said wax supply means only after movement of said carriage and wax applicator means in one direction and before the movement thereof in the reverse direction; said waxer pads following the contour of said skis and the weight of said suspension means applying a uniform pressure to the skis.

18. The method of waxing skis by means of a rotating wax applicator comprising the steps of: supporting the skis; removing old wax from the skis by passing said wax applicator over them in one direction, supplying said wax applicator with wax while reversing the direction of movement of said wax applicator, coating the skis with wax while passing said wax applicator back over said skis, and heating said wax applicator during the occurrence of said above mentioned steps.

19. Mechanism for removing and applying wax to skis comprising: a body, means for supporting said skis in said body including means for clamping said skis on said support means, said support means being in the form of a drawer withdrawable from said body for loading and unloading said skis on said support means, carriage means suspended over said support means and movably mounted on said body for movement from a home end of the body to a far end of the body and return, rotatable waxing pads journaled in brackets pivotally mounted on said carriage and drive means for said waxing pads, electrical circuit means; said electrical circuit means including safety switches associated with each ski and said drawer which must be activated before said circuit can be energized; waxing blocks at the far end of said body; interlock means between said drawer and said body switch means for energizing said electrical circuit means, carriage drive means and waxing pad drive means, limit switch means for controlling the forward, return and stopping of said carriage drive means and the rotation of said waxing pad, said waxing pads removing wax from said skis during forward movement of said carriage and engaging wax blocks placed at the far end of said body during reversal of said carriage, said waxing pads applying wax to said skis upon return movement of said carriage; and heating means for applying heat to said waxing pads.

20. Mechanism for removing and applying wax to skis comprising: a body, means for supporting said skis in said body, said support being in the form of a drawer withdrawable from said body for loading and unloading said skis on said support, carriage means suspended over said support and movably mounted on said body for movement from a home end of the body to a far end of the body and return, rotatable waxing pads journaled in brackets pivotally mounted on said carriage means whereby the contour of the skis are followed and a uniform pressure is applied to said skis during the wax removal and application; carriage drive means for movement of said carriage and drive means for said waxing pads; waxing blocks at the far end of said body; electrical circuit means for controlling said carriage and waxing means; said waxing pads removing wax from said skis during forward movement of said carriage and engaging wax blocks placed at the far end of said body during reversal of said carriage, said waxer pads applying wax to said skis upon return movement of said carriage; and heating means for applying heat to said waxer pads.

21. Mechanism for removing and applying wax to skis comprising: a body, means for supporting said skis in said body, heated rotatable waxing means adapted to be moved back and forth lengthwise across the skis, means for rotating said waxing means in a constant direction whereby movement against rotation causes removal of old wax and movement with rotation causes application of wax; and wax supply means for supplying said waxing means with wax before movement of said waxing means with the direction of rotation; said wax supply means including at least two kinds of wax, and means for moving said different kinds of wax into a position to be engaged by said waxing means.

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