Dec. 2, 1952 A. SHARENOW ET AL 2,620,419

RHEOSTAT

Filed Aug. 25, 1950 2 SHEETS--SHEET 1

Fig. 1.

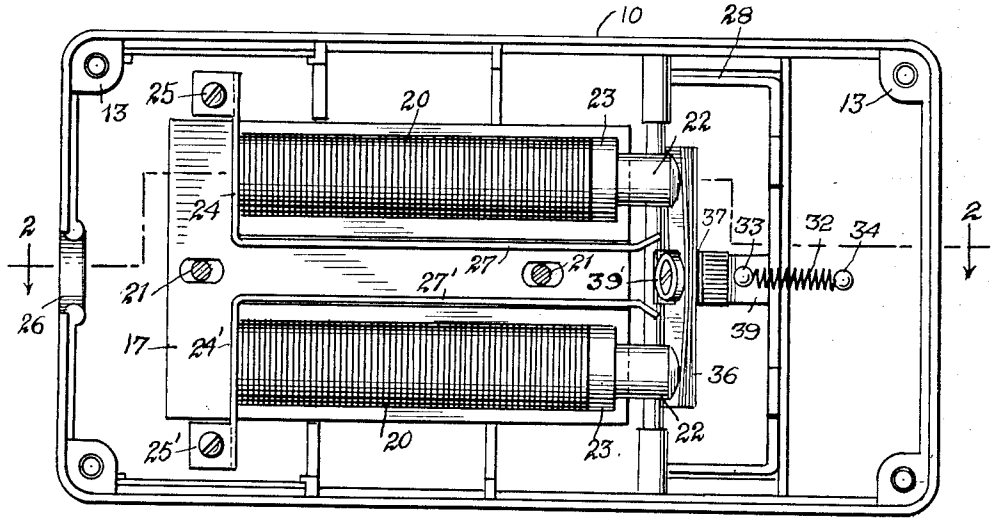


Fig. 2.

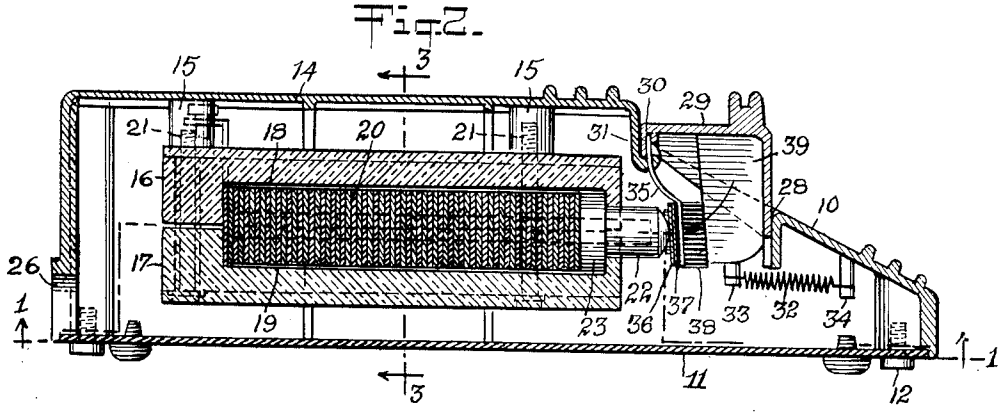
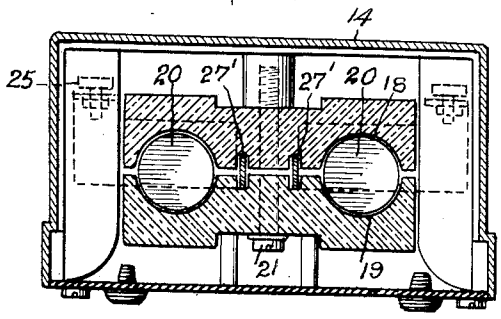


Fig. 3.



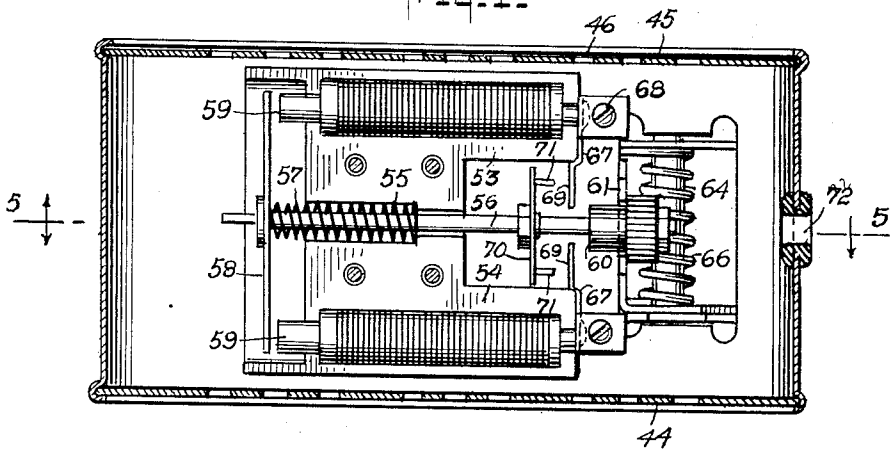
INVENTORS
Alexander Sharenow
and Donald M. Stadd
BY
Munn, Liddy & Glascum
Attorneys

Dec. 2, 1952 A. SHARENOW ET AL 2,620,419

RHEOSTAT

Filed Aug. 25, 1950 2 SHEETS—SHEET 2

Fig. 4.



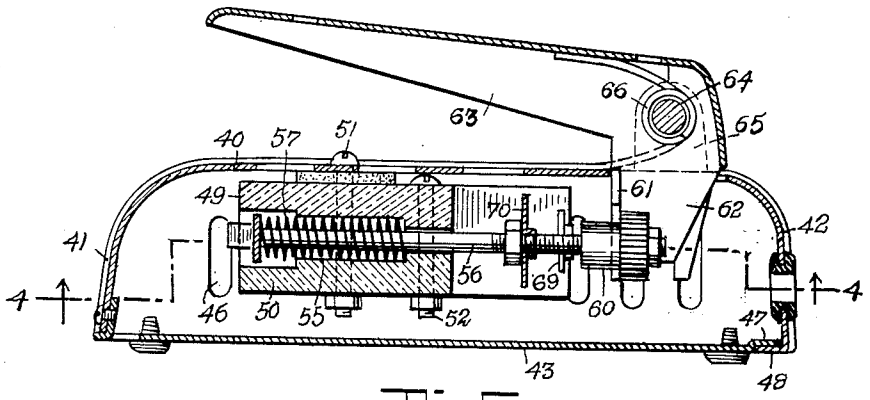


Fig. 5.

INVENTORS
Alexander Sharenow
and Donald M. Stadd
BY
Munn, Liddy & Glaccum
Attorneys

Patented Dec. 2, 1952

2,620,419

UNITED STATES PATENT OFFICE

2,620,419

RHEOSTAT

Alexander Sharenow, East Rockaway, and Donald M. Stadd, New York, N. Y.; said Stadd assignor to said Sharenow

Application August 25, 1950, Serial No. 181,526

3 Claims. (Cl. 201—51)

1

This invention relates to new and useful improvements in rheostats, particularly the type operated by foot or knee lever to control machine operations such as sewing machines and the like.

The object of the invention is to provide a construction of rheostat and particularly the form of resistor unit construction and linkage for operating the same which can be made cheaply, be efficient, is well ventilated, and durable in use and compact in respect to space occupation.

In brief and general terms, the invention includes a pressed or cast metal supporting plate from the lower surface of which is supported an insulating block formed of spaced split sections and containing a series of resistance disks housed therein with compression elements in the form of stems extending from the block and adapted to be engaged by a conducting switch element to exert pressure on the disks and vary their resistance in the circuit with which they are connected in any suitable manner.

The conducting switch element is supported insulatingly on a member which can be moved by depressing a foot pedal mounted on the casing and which is held in normal inoperative position by means of spring action. In either form, the foot pedal comprises a plate portion which substantially fills a transverse gap in the top of the casing and has a portion extending above the top of the casing to be engaged by the foot of the operator. These pedals are pivoted to the casing and have dependent portions extending down into the casing and insulatingly connected to the switching elements so that the elements are moved to compress the resistance disks up to a certain point in the movement thereof after which direct contact is made with the main circuit to bypass the disks.

The present preferred forms which the invention may assume are illustrated in the drawings, of which,

Fig. 1 is a horizontal section through the preferred form taken along the section line 1—1 of Fig. 2;

Fig. 2 is a vertical longitudinal section taken along the line 2—2 of Fig. 1;

Fig. 3 is a vertical transverse section taken along the line 3—3 of Fig. 2;

Fig. 4 is a horizontal section through a modified form of the invention taken along the line 4—4 of Fig. 5; and,

Fig. 5 is a vertical longitudinal section taken along the line 5—5 of Fig. 4.

Referring now merely to the specific structure

2

shown in these forms, it will be seen with reference to Figs. 1, 2 and 3 particularly that there is provided a cast or pressed metal casing 10 having an open bottom across which a closure plate 11 may be disposed by means of screws 12 at the corners thereof, extending into corner bosses 13 on the casing.

Integrally formed on the under side of the top wall 14 of the casing 10 are spaced dependent lugs 15 with threaded bores. These lugs are employed to support an insulating block formed of upper and lower sections 16 and 17 of insulating material such as porcelain. These sections are, on adjacent faces, provided with semi-circular longitudinal grooves 18 and 19 which when the sections are abutted form circular grooves to receive, in any suitable manner a plurality of carbon or other resistance and conductive disks 20. These grooves do not extend to the ends of the sections as shown in Fig. 2, and their diameter is greater than the diameter of the disks 20 so that there is thus formed an air space around the disks to somewhat ventilate them.

The block sections are held in place on the wall of the casing and with respect to each other by means of screws 21 which extend up through the sections and are threaded into the bores of the lugs 15 above mentioned. Compression members engage one end of the disks 20 and are in the form of stems 22 extending into the ends of the block and having disk-like heads 23 which are adapted to press against the series of disks 20 when pressure is exerted against the ends of the stems 22. It is of course to be noted that there are two sets of disks in the block and therefore two stems, each contacting its set of disks as clearly shown in Fig. 1.

The inner ends of the disks are connected to conducting strips 24 and 24' on one end of which are binding posts 25 and 25' to which conducting wires may be connected after passing into the casing 10 through conductor opening 26 at an adjacent end of the casing. After contacting the inner ends of the disks, these strips are extended in spaced parallel relation to the other end of the series of disks adjacent the ends of the stems 22 where they may be contacted by a switch element to make a direct circuit connection and by-pass the disks when desired. These extended portions are numbered 27 and 27'. It will be noted that these strips (see Fig. 3) are of a height somewhat greater than the normal depth of the grooves in the block sections in which they are disposed so that they are effective to maintain the upper block section well

spaced from the adjacent face of the lower block section to provide a transverse passage throughout the length of the sections whereby the carbon or other conducting disks disposed between the sections are well ventilated, and the heat therefrom more effectively dissipated.

At the end of the casing adjacent the stems 22, it is provided with a transverse opening 28 of rectangular shape into which is snugly disposed a pivoted switch operating pedal plate 29 of similar shape. The inner edge of this plate is provided with a downwardly extending lip or edge 30 which rests in a groove 31 formed on the adjacent edge of the casing as shown in Fig. 2. A spring 32 is disposed between a pin 33 on the lower face of the plate 29 and a pin 34 on the inner face of the casing 10 to tend to hold the pedal plate 29 in its normal inoperative position shown in Fig. 2. Dependent from the under face of the plate 29 is a plate 35 extending down across the ends of the stems 22 and supporting a series of conducting switch leaves 36. Suitable plates of insulation 37 and 38 are disposed on opposite sides of plate 35 to insulate leaves 36 from the pedal 29. The rear insulating plate 38 is abutting dependent flange 39 on the inner face of the plate 29 and a suitable screw means 39' properly insulated holds these elements to the flange 39.

In the operation of this form of the invention it will be clearly seen that when the parts are in their normal inoperative position shown in Fig. 2, the pedal plate 29 is up and the leaves 36 do not contact the stems to compress the carbon or conducting disks. However, whenever the operator presses his foot on the pedal plate, the leaves conductively contact the stems and exert pressure upon the disks and thereby varies their resistance in accordance with well known laws of conductivity. It is also to be observed that when the pedal plate 29 is depressed to its fullest extent, then the leaves will contact the adjacent spaced ends of the strips 27 and 27' to make a direct contact with them and thereby by-pass the disks and cut out the resistance thereof from the circuit. As soon as the operator's foot is lifted from the pedal plate 29, the action of spring 32 will restore the parts to their normal inoperative disconnected position with the circuit open.

Now referring to the modified form of the invention shown in Figs. 4 and 5, it will be seen that the main casing is a curved plate having a top wall 40 and downwardly curved end walls 41 and 42. To form a complete casing, the plate is related to a bottom plate or closure element having a bottom wall 43 and upwardly extending side walls 44 and 45 provided with ventilating holes 46 therein. This closure element is snapped into place and held by means of screw 46 and by reason of a lip 47 thereon resting on a horizontal lip 48 of the end wall 42 of the plate 40 (Fig. 5).

In this form of the invention, we have somewhat the same general operation as in the previous form but slightly different in the mechanical arrangements. In this form we have the insulating block having upper and lower sections 49 and 50 which as before set forth support carbon disks in series between the block sections with the air space therearound to ventilate the same. The block sections are supported from the wall 40 of the casing by means of screws 51 and to each other by screws 52.

The main difference between this form of device and the one just described is in the particular manner in which the pedal switch is connected and operated. In this case the insulating block sections are of somewhat U-shape as seen in Fig. 4 with a main body and spaced legs 53 and 54. They are also provided with a central opening 55 through which passes an operating rod 56 and around which is coiled a spring 57. At the left portion of this rod there is connected a transverse plate 58 movable therewith and adapted when the rod is moved to press against the stems 59 extending from the carbon disks in the manner above described with respect to the other form of the invention. The spring 57 tends to keep the rod 56 to the left and thus keep the plate 58 out of contact with the stems 59 under normal conditions. At the other end of the rod 56, there is connected thereto an insulating bushing or sleeve 60 which is embraced by the forked lower end of a plate 61 to one side of which is connected a dependent plate 62 formed from the pedal member or plate 63 which is pivotally mounted on cross shaft 64 supported between upstruck ears 65 on the top of the main plate 40 and also urged to a normal position by means of a spring 66 coiled around the shaft and having one end resting on the top of plate 40 and the other bearing against the under face of the pedal plate 63 as shown in Fig. 4.

In this form, the carbon disks are connected as before to conductive plates 67 having binding posts 68 thereon and lateral extensions 69 with their ends lying adjacent the rod 56. The rod 56 is, between the legs 53 and 54 of the insulating block sections, provided with a conducting cross plate 70 having projecting fingers 71 adapted, when the rod is moved to the right a sufficient distance, to contact the lateral extensions of plates 67 and make direct circuit contact as before. An opening 72 is formed in the casing wall 42 to permit lead wires to be connected to the binding posts 68. It will be noticed that in this form the pedal plate 63 is pivoted at one end of the device and extends over the same toward the other end and thus forms a much greater leverage for the operation of the device than in the other form.

In the operation of this form of the invention, when the pedal plate is depressed by the operator, the rod 56 is moved to the right pulling the plate 58 at its other end toward the projecting ends of the stems 59 and compressing the carbon disks as before. When the pedal is depressed to its full extent, the plate 70 with its fingers 71 are advanced far enough to contact the extensions 69 and make direct contact to by-pass the disks as before. When the pedal is released by the operator, then the spring 57 will move the rod 56 to the left and restore the parts to their normal inoperative disconnected position.

In view of the above specific description of the two forms of the invention illustrated in the drawings, it will be apparent that each foot pedal is pivoted to the top of the casing and is adapted to substantially cover the transverse opening therein above which it is pivoted. The pedals in each case have a portion extending above the top of the casing to be engaged by the foot of the operator and also have in each case a dependent portion extending down into the casing to be pivotally moved when the foot of the operator presses upon the pedal portion above the top of the casing. In each case the dependent pedal portion is insulatingly associated with a switch member which is moved to compress the resist-

ance disks up to a certain point and thereafter to make contact directly with the main circuit to by-pass the disks. In one form, the compression elements are pressed against the disks whereas in the other form they are pulled against the disks.

In one form, the switch compressor elements are carried directly on the dependent portion of the pedal but insulated therefrom whereas in the other form, the switch compressor elements are mounted on a rod which is operated by the pedal and pulled toward the disks to compress them.

While the invention has been described in detail and shown with respect to the accompanying drawing, it is not to be limited to such details, since many changes and modifications may be made in the invention without departing from the spirit and scope thereof. Hence, it is desired to cover any and all forms and modifications of the invention which may come within the language and scope of any one or more of the appended claims.

We claim:

1. A rheostat unit comprising a casing, an insulating block supported within said casing from the top thereof, a series of resistance disks within said block, a compression member associated with said disks, said casing having a transverse opening in the top thereof, a pedal element pivoted to the top of the casing and having a dependent portion extending into and substantially covering said opening, conductive switching means insulatingly associated with said dependent portion and adapted, when the pedal is moved from normal position to contact the compression member and compress said disks, the improvement in which the casing has a groove along one edge of the transverse opening and the pedal element has a dependent lip seated in said groove to pivot thereon, a spring plate connected to the pedal element and supporting a switch plate insulatingly thereon, said switch plate to be advanced to contact with the compression member when the pedal element is depressed, and spring means connected between the pedal element and the casing to restore the parts to normal inoperative position when the pressure of the foot on the pedal element is released.

2. A rheostat unit comprising a casing, an insulating block supported within said casing from the top thereof, a series of resistance disks within said block, a compression member associated with said disks, said casing having a transverse opening in the top thereof, a pedal element pivoted to the top of the casing and having a dependent portion extending into and substantially covering said opening, conductive switching means insulatingly associated with said dependent portion and adapted, when the pedal is moved from normal position to contact the compression member and compress said disks, the improvement in which the insulating block has a pair of series of resistance disks therein, with a compression member associated with each series, a switch plate insulatingly supported from the dependent portion of the pedal element and adapted when the element is depressed by the foot of an operator to be advanced into contact with the compression members to press against the series of disks, and a spring means connected between the pedal element and the casing to restore the parts to normal inoperative position when the foot pressure is released.

3. A rheostat unit comprising a casing, an insulating block supported within said casing from the top thereof, a series of resistance disks within said block, a compression member associated with said disk, said casing having a transverse opening in the top thereof, a pedal element pivoted to the top of the casing and having a dependent portion extending into and substantially covering said opening, said pedal element being insulatingly connected to one end of a rod which passes through the insulating block, a switch on the other end of said rod adapted to contact the compression member to exert pressure on the disk when the pedal element is depressed, said rod being connected to a spring within the block to hold it in a normal position, and an extra switch plate disposed on an intermediate portion of the rod to be engaged when the rod is moved beyond a predetermined point with contact strips related to the series of disks whereby said disk may be electrically bypassed.

ALEXANDER SHARENOW.
DONALD M. STADD.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,777,988	Wilms	Oct. 7, 1930
1,827,372	Riddell	Oct. 13, 1931
1,949 826	Chason	Mar. 6, 1934
2,533,519	Sharenow	Dec. 12, 1950
2,561,556	Bell	July 24, 1951