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2,117,782

ELECTRIC SWITCH

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Fig.1

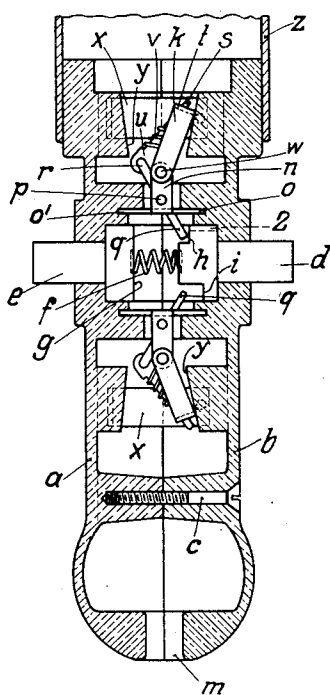


Fig.3

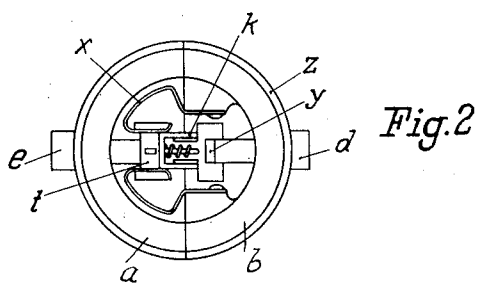
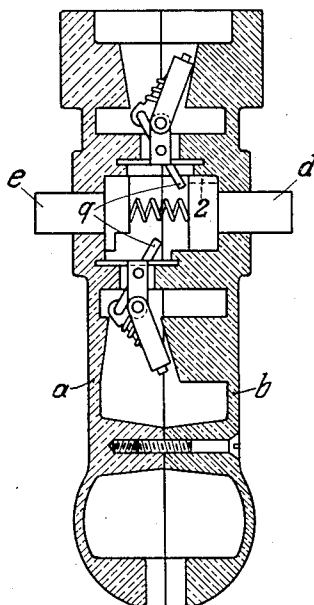


Fig.2

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ELECTRIC SWITCH

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4 Claims. (Cl. 200—157)

This invention relates to an electric switching device for two circuits mounted in the handle of a consuming apparatus, both of which circuits are successively switched on, or only one of them is switched on, whilst both are switched off simultaneously.

The switching device consists of two toggle switches inserted in the two circuits and mounted in the handle one behind the other in the longitudinal direction of the handle, two press buttons movable against one another and acting directly on the toggle switches being arranged between the latter, transversely to the handle, one of the press buttons being adapted to switch on only one toggle switch or both toggle switches one after the other, whilst the other is adapted to switch off the two toggle switches simultaneously, a spring being mounted between the two press buttons which returns the latter automatically into their initial position.

The consuming apparatus which especially come into question are hot air douches which are desired to operate not only with hot air but also with cold air instead. In the first case, only the one toggle switch is switched on which lies in the motor circuit. In the second case, by the additional switching on of the second toggle switch, also the toggle switch lying in the heating circuit is switched on. By successively switching on, first the motor or cold air switch, and then the heating or hot air switch, the hot air current is prevented from being inadvertently switched on and thereby the heating resistance prevented from being overheated. The simultaneous switching off of both circuits has the same effect and such switching action is quick and positive. The successive switching on of the circuits may be effected in various ways.

The invention provides a very simple and compact construction of switching device which can be mounted in a handle of the usual dimensions of a consuming apparatus. The switching on and off of the circuits can be effected conveniently by using one hand only, viz., the one holding the apparatus, the other hand being free for other manipulations.

Further the construction according to the invention is such that the two toggle switches can be easily and conveniently mounted and secured in position in the handle of the consuming apparatus.

The accompanying drawing illustrates, by way of example, a handle for a hot air douche provided with an improved switching arrangement.

Figure 1 shows a longitudinal section of the

improved device with the press buttons and toggle switches in the starting position;

Figure 2 is a plan view showing the circuit closing position of the upper toggle switch (cold air) operation;

Figure 3 illustrates a modification of the improved device.

Referring to Figures 1 and 2, the handle, which is preferably made of a compressed electric insulating fibrous material, is divided longitudinally into two halves *a*, *b* and is made hollow. When used the two halves are held together, partly by a tubular clamp *z*, which connects the inner end of the handle to the actual apparatus, and partly by a screw *c*. Two oppositely moving press buttons *d* and *e* are arranged transversely to the handle, one of them serving as a switching-on button and the other one as a switching-off button. Usually, the two press buttons are kept apart by a spring *f* inserted between them, being caused to abut against the inner wall of the two halves of the handle. The switching-off button *e* has a smooth inner surface *g*, whilst the switching-on button *d* is provided with a stepped inner surface having two switching steps *h* and *i*, the latter lying further behind the outer end of the press button as compared with the former. Two toggle switches are arranged laterally with respect to the two press buttons, one behind the other in the longitudinal direction inside a hollow space provided in the handle. The toggle switch adjacent to the small switching step *h* of the switching-in button serves for the connecting up of the motor circuit, and the switch adjacent to the larger step *i* of the switching-on button serves for the switching-on of the heating current, the two steps *h* and *i* of the switching-on button being made of different heights. When they are pressed down the two switches are actuated one after the other, first the motor switch and then the heating current switch. Vice versa, when the switching-off button *e*, which is not stepped, is pressed down, the two switches are simultaneously operated for the opening of the circuits.

Each switch has a support which consists of two upright parts *n* (in Figure 1 they lie one behind the other) and two strongly acting foot plates *o'*, *o*. The latter are inserted (by friction or clamping) in corresponding slots provided in the two handle halves—in the half *b* so as to be firmly seated, and in the other half so as to be lightly seated—whereby the two switches can be secured in the handle in a very simple way. The two-arm lever *q*, *r* is mounted in pivot holes *p* of the two uprights *n*, the end of the arm *q*

lying within the range of operation of the step *h* or *i* of the switching-on button. A rod *s* is linked on to the end of the other arm *r*, which rod passes through an opening of the saddle *t* of the toggle switch or switch stirrup *k*. A compressed spring *v* is mounted between the saddle *t* and the head *u* of the rod *s*. The stirrup *k*, which is pivotally mounted in the holes *w* of the uprights *n*, closes the circuit when in the tilted out position (see Figure 2), by forming a bridge between the current carrying contact springs *x* secured to the half *b* of the handle. The tilting movement of the stirrup is limited by the abutment surfaces *y* of the handle halves. Although in the position in which the circuit is closed current passes through the parts *n*, *o*, *o'* of the two switches, the latter parts are insulated in the handle. The cable carrying the current passes through the opening *m* in the handle.

When the switching-on button *d* is pressed down the spring *f* is compressed, and its step *h*, by abutting against the end of the arm *q* of the toggle switch adjacent to it (the upper one), switches on the motor circuit and then, by its step *i* acting on the end of the arm *q* of the lower switch, it switches on the heating current. The spring *f* automatically returns the button *d* into its original position. When it is desired to stop the operation of the apparatus the switching-off button *e* is pressed down and its inner smooth surface *g*, whilst compressing the spring *f*, acts simultaneously on the ends of the arms *q* of both switches, thereby switching-off simultaneously the two circuits, whereupon it is returned automatically to its original position by the spring *f*. When it is desired to work with cold air, the switching-on button is pressed down, only to such an extent until the upper switch is operated, which, apart from the noise of the impact of the switching stirrup, is also perceived by the hand, owing to the changed resistance of the press button.

The mounting of the toggle switches in the handle is effected in an especially simple manner, without any separate fixing screws or the like, so that the two switches with one of their supporting plates *o* are inserted in the corresponding slits provided in the part *b* of the handle, in which the electrical connections have already been effected, and then the other half of the handle is slid on to the support parts *o'* which are still free and is secured to the first half *b* of the handle.

The modification illustrated in Figure 3 differs from the one shown in Figures 1 and 2 in that the press button *d* for the switching-on is not stepped, whilst the press button *e* for the switching-off is stepped, and the lower toggle switch which, as in the case of the form of construction illustrated in Figures 1 and 2, serves to switch on the heating current is mounted less deep in the half *b* of the handle as compared with the upper toggle switch, so that in its initial position, viz. when the lower switch is disconnected, the arm *q* of the latter switch lies at a greater distance from the press button *d* than the arm *q* of the upper toggle switch. Also in this way it is possible to obtain that by means of the press button *d* the upper toggle switch is first

actuated, that is to say, the motor circuit or the cold air is first switched on, that the heating current or the hot air is switched on afterwards, and that after the apparatus has been used the two circuits are simultaneously switched off by means of the switching-off press button *e*. In order to ensure that the further movement of the press button *d*, after the operation of the upper toggle switch, shall not be hindered by the arm *q* of this switch, a group 2 is provided in the press button *d*, by means of which the press button slides past the arm *q* of the upper switch while it actuates the lower switch.

What I claim is:—

1. An electric switching device mounted in the handle of an electric consuming apparatus for two electric circuits, comprising two toggle switches inserted in the said two circuits and mounted in the handle, one behind the other, in the longitudinal direction of the handle, both toggle switches having a stationary switched-off position and a stationary switched-on position different from the switched-off position, a switching-on press button and a switching-off press button capable of moving against one another and lying between the toggle switches transversely to the handle, the said two toggle switches having arms projecting into a free space between the said two press buttons with their respective free ends at different distances from the parts of the switching-on press button intended to act thereon when the toggle switches are in the switched-off position, and at the same distance from the parts of the switching-off press button intended to act thereon when the toggle switches are in the switched-on position, whereby the switching-on press button will act successively on the two toggle switches and the switching-off press button will act thereon simultaneously and a spring between the said two press buttons for returning the latter automatically into their initial position.

2. An electric switching device as claimed in claim 1, in which the switching-on press button has two switching steps providing the different distances thereof from the free ends of the projecting arms of the toggle switches.

3. An electric switching device as claimed in claim 2, and in which the switching-on press button has a groove so disposed as to allow the said switching-on press button to slide past the arm of one of the toggle switches already switched-on while it actuates the other toggle switch.

4. An electric switching device as claimed in claim 3, further comprising a transverse supporting plate on each one of the two toggle switches, the handle being divided longitudinally into two halves in which the two press buttons are respectively mounted opposite one another, and each one of the said handle halves having two transverse slits on opposite sides of the press button mounted therein, and the two transverse supporting plates lying firmly in the transverse slits formed in the one half and lightly in the transverse slits formed in the other half of the handle.

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