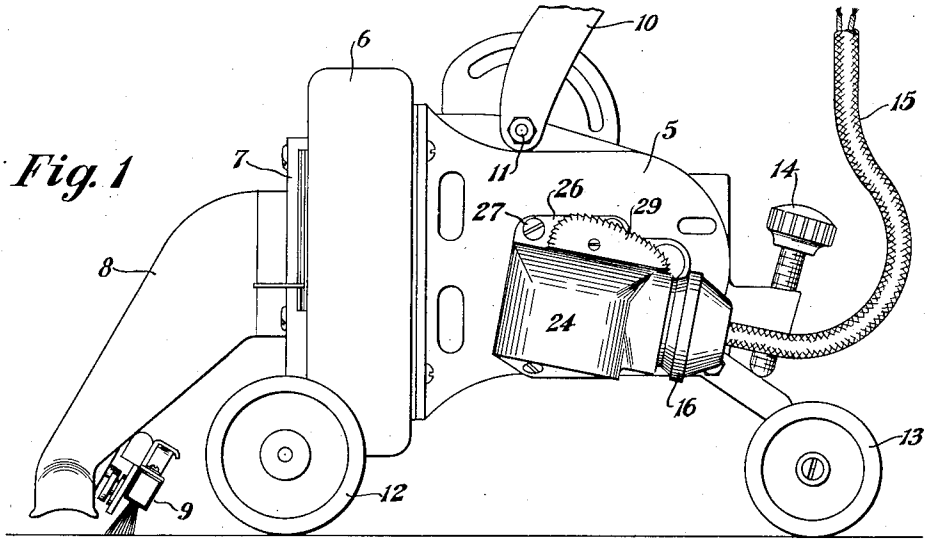
April 12, 1938. E. F. MARTINET 2,113,700

SUCTION CLEANER SWITCH

Filed March 15, 1934

Fig. 1



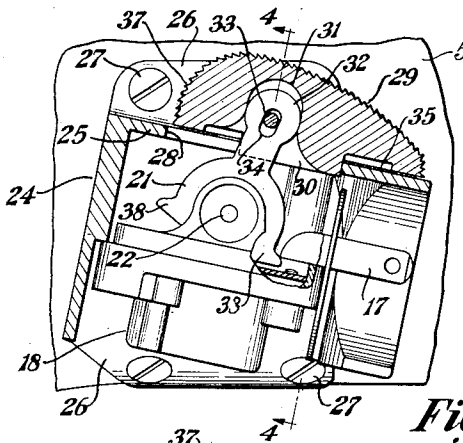




Fig. 2

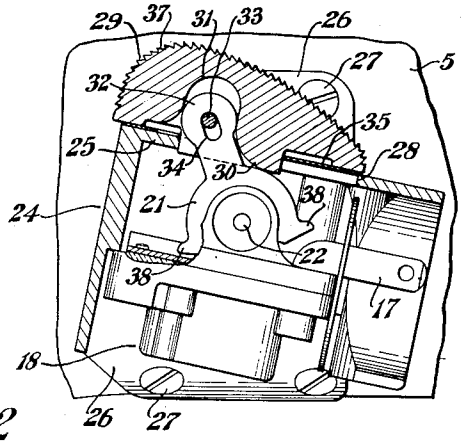



Fig. 3

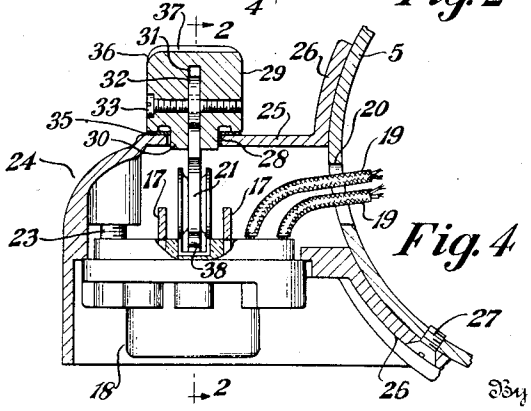



Fig. 4

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2,113,700

## SUCTION CLEANER SWITCH

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2 Claims. (Cl. 200—52)

The invention relates to electric switches, and more particularly to the actuating and mounting mechanism therefor; and the improved switches are particularly adapted for use in electric suction cleaner construction wherein a controlling switch for the suction cleaner motor is mounted on or adjacent to the motor housing, as distinguished from a switch mounted on the operating handle of a suction cleaner as shown in the Willis Patent No. 1,517,811.

In certain types of electric suction cleaners, it it desirable, for convenient operation thereof, to have a foot operated motor controlling switch on or adjacent to the motor housing of the cleaner. However, in prior constructions of this general character, difficulty has been experienced and damage is done to the switch mechanism per se, because the kicking forces, frequently of relatively great magnitude, applied to the switch actuating member are transmitted directly to the delicate parts of the switch mechanism, frequently causing such damage to be done to the switch mechanism as may require complete replacement thereof.

It is therefore an object of the present invention to provide an electric switch and actuating mechanism therefor in which the forces applied to the actuating mechanism for operating the switch are not transmitted to the delicate parts of the switch mechanism per se in such a manner as to cause undue strain or damage to the switch mechanism.

It is a further object of the present invention to provide an electric switch and actuating mechanism therefor in which the switch mechanism per se does not have any work to perform except the making and breaking of contact to complete or break an electric circuit; and in which the delicate parts of the switch mechanism, even though they may be provided with stop means for limiting the motion of the movable contact elements, do not operate as stop means for limiting motion of the actuating mechanism.

The easiest motion for operating a foot operated switch, particularly on a suction cleaner, has been found to be one which is either a forward or a backward swinging motion of the leg below the knee, as distinguished from an up or down kicking motion.

It is therefore an object of the present invention to provide an electric switch and actuating mechanism therefor in which the actuating mechanism may be operated by a forward or rearward longitudinal or swinging movement of the foot and leg below the knee, or other body part of the operator, as by providing a longitudinally movable operating member for actuating the usual efficient type of rotary oscillatable snap switch.

It is a further object of the present invention to provide an electric switch and actuating mechanism therefor in which the operator's foot may engage the actuating member on either the top, side, or end of the actuating member to operate the switch.

Moreover, it is an object of the present invention to provide an electric switch and actuating mechanism therefor in which normal wear of the parts or the accumulation of dirt thereon or therebetween will not cause the parts to jam or render their operation difficult.

And finally, it is an object of the present invention to provide an electric switch and actuating mechanism therefor in which some or all of the above desirable characteristics are incorporated, and which is relatively inexpensive to construct, susceptible of utilizing standard types of switch mechanisms per se that are on sale on the market, and which are very efficient in use.

These and other objects may be obtained by the elements, combinations, constructions and arrangements hereinafter described in detail and claimed, a preferred embodiment of which is shown in the accompanying drawing, in which:—

Figure 1 is a fragmentary side elevation of a suction cleaner equipped with the improved switch and actuating mechanism;

Fig. 2 is an enlarged longitudinal section, certain parts being shown in full lines, of the improved switch and actuating mechanism, taken on the line 2—2, Fig. 4, showing the switch in "off" position;

Fig. 3 is a view similar to Fig. 2 showing the switch in "on" position; and

Fig. 4 is a cross section, certain parts being shown in full lines, of the improved switch and actuating mechanism, taken on the line 4—4, Fig. 2.

Similar numerals refer to similar parts throughout the various figures of the drawing.

A usual type of suction cleaner is shown in Fig. 1, which may comprise a motor (not shown) in a motor housing 5, provided with a fan housing 6 having a fan (not shown) therein driven by the motor, to which fan housing 6 may be detachably connected at 7 a suction nozzle 8, which may be provided with a brush 9. An operating handle 10 is preferably pivotally connected to the motor housing 5, at 11, and a dust bag (not shown) is connected to the exhaust side of the fan hous-

ing 6. The motor housing 5, the fan housing 6, and the nozzle 7 are all mounted on front casters 12 and rear casters 13, the rear casters being preferably adjustable by the adjusting means 14.

Ordinarily, electric current for operating the motor is supplied thereto by means of a flexible conductor 15, which is preferably detachably suspended from the handle 10 and leads to any source of power; and the conductor 15 is preferably detachably connected by a usual plug 16 to the contact fingers 17 of the electric switch generally indicated at 18, from which switch, conductors 19 may lead through an aperture 20 in the motor housing 5, to the motor therein.

The electric switch unit 18 is of any usual construction that is on sale on the market of the so-called snap switch type in which the switch operating lever 21 is pivotally mounted at 22 on the switch and operates a spring actuated toggle mechanism for making and breaking contact to complete or interrupt an electric circuit.

The electric switch unit 18, is preferably mounted by screws 23 to and within the switch housing, generally indicated at 24; and the switch housing 24 preferably includes a top wall 25 and curved flanges 26. Screws 27 are provided for securing the switch housing 24 to the motor housing 5.

The top wall 25 of the switch housing is preferably provided with an elongated rectangular slot 28 which is closed at both ends by top wall portions, as shown in the drawing through which the switch operating lever 21 projects, and a switch actuating member generally indicated at 29 is movably, preferably slidably, mounted exteriorly of the switch housing 24 on the top wall thereof, for movement in a direction substantially longitudinal and slightly upward of the axis of the suction cleaner.

The member 29 is preferably provided with an elongated rectangular projection 30 which is inserted laterally into the slot 28, of the switch housing top wall 25, so as to engage the top wall 25 at either one end or the other of the slot 28; thus providing stop means for limiting longitudinal movement of the switch actuating member 29.

A rounded recess 31 is preferably provided in the member 29 extending from a portion of the projection 30, to provide for the reception of the rounded end 32 of the switch operating lever 21; whereby movement of the switch actuating member 29 in a longitudinal direction imparts rotary movement to the switch operating lever 21.

The switch actuating member 29 may be secured in assembly relation to the switch housing in any suitable manner by attaching it to the switch operating lever 21 as by securing an exteriorly accessible pin or screw 33 to the member 29 extending through an elongated slot 34 in the end of the switch operating lever 21.

A rectangular pad or elongated washer 35 of anti-friction, preferably insulating material, having a rectangular opening therein surrounds the projection 30 and is preferably interposed between the switch actuating member 29, and the switch housing 24, movable with the member 29 for preventing wear of the member 29 and the housing 24, which are usually made of metal; so that such wear, or the accumulation of dirt will not render the part 29, hard to operate.

The top and ends of the switch actuating member 29 are preferably convex as shown in the drawing, and rounded corners are preferably provided between the top and side surfaces of the member 29 (Fig. 4). The top of the member 29 and the outer rounded corner 36 thereof farthest from the motor housing 5, are preferably provided with roughened, serrated, or knurled surfaces 37 for rendering the actuating member 29 easy of engagement with, and operation by the foot or other body part of the operator.

By so constructing the switch 18, the switch housing 24, the actuating member 29, and the parts connecting the same, any force or pressure applied to the actuating member by foot operation of the switch, is transmitted entirely to the switch housing so that the delicate parts of the switch mechanism are not subjected to undue strain or damage, and the switch mechanism per se does not have any work to perform excepting only the making and breaking of electric contact.

Although the usual switch lever 21 is provided with stops 38 which limit rotary movement of the lever when the switch is in normal use, it is pointed out, as shown in Figs. 2 and 3, that the stops 38 of the switch lever 21 do not function as such in the construction of the improved invention.

Thus, the projection 30 of the switch actuating member 29 engages the top wall 28 of the switch housing 24 in either "off" or "on" position of the switch to limit further movement of the member 29, and therefore of the switch lever 21, before the switch lever stops 38 come into operation.

Accordingly, the particular construction prevents force applied to the actuating member 29 for moving the same, from being transmitted to the switch; such forces being transmitted directly to the switch housing when the actuating member 29 is brought to a stop at the limit of its movement in either direction.

The location of the actuating member 29 at the top of the switch housing 24, and the mounting thereof for longitudinal movement enables the same to be operated by an easy swinging motion of the leg of the operator below the knee.

Moreover, because both the top surface of the member 29 and the outer corner 36 thereof are roughened, the actuating member 29 may be readily operated by engagement of the foot with either the top or the corner portions thereof.

Likewise, the arrangement of the improved construction permits the spring of the switch toggle mechanism to hold the actuating member at the limit of its movement in either position, free from rattling or vibration, despite the fact that the actuating member 29 has a loose connection with the lever 21 for imparting rotary motion to the lever 21 by longitudinal movement of the member 29.

And finally, the improved switch construction and mounting and actuating mechanism therefor, is inexpensive to construct, easy to operate, very efficient in use, and is susceptible of utilizing standard types of snap switches which are on sale on the market.

I claim:—

1. In a foot-operated switch construction for a suction cleaner motor, a housing having a top wall provided with a rectangular slot, a switch unit secured to the housing within the same having an operating lever projecting through said slot, an actuating member for the switch movably supported exteriorly of the housing on the top wall thereof having a rectangular projection inserted into the slot laterally of said top wall,

means accessible exteriorly of the housing engaging the actuating member and operating lever loosely attaching the actuating member to the operating lever and maintaining the actuating member assembled to the housing, and a rectangular pad of anti-friction insulating material having a rectangular opening therein surrounding said projection and interposed exteriorly of the housing between the actuating member and housing, whereby wear or the accumulation of dirt incident to the loose mounting of the actuating member and the operation of the cleaner cannot render the actuating member hard to operate.

2. In a foot-operated switch construction for a suction cleaner motor, a housing having a top wall provided with a closed end rectangular slot, a switch unit secured to the housing within the same having an operating lever projecting through said slot, said lever having an elongated slot formed therein, an actuating member for the switch movably supported exteriorly of the housing on the top wall thereof having a rectangular projection inserted into the slot laterally of said top wall, and a pivot pin carried by the actuating member accessible exteriorly of the housing and passing through said elongated slot in the operating lever forming the sole means for attaching the actuating member to the operating lever and for maintaining the actuating member assembled to the housing, whereby the switch is relieved from any stress due to pressure applied to the actuating member by a foot operation thereof.

EUGENE F. MARTINET.