

United States Patent

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[54] **LINEAR SWITCH**
2 Claims, 5 Drawing Figs.
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[51] Int. Cl. **H01h 13/16**
[50] Field of Search..... 200/86,
61.57; 340/272

ABSTRACT: A linear switch having a pair of elongated superposed metal strip conductors enclosed in a resilient nonconductive casing with a nonconductive strip on the outer side of one of the conductors having inturned springy flanges extending between the strip conductors and normally holding the same in spaced relation.

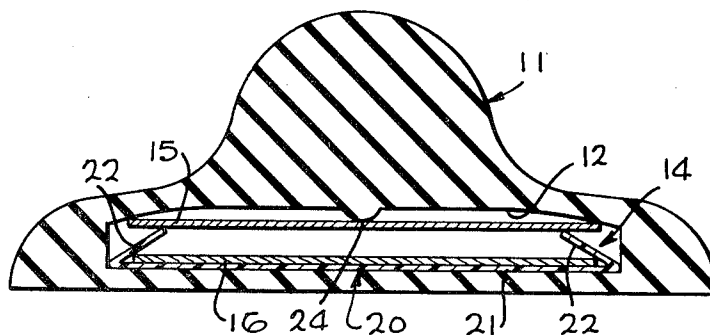


Fig. 1

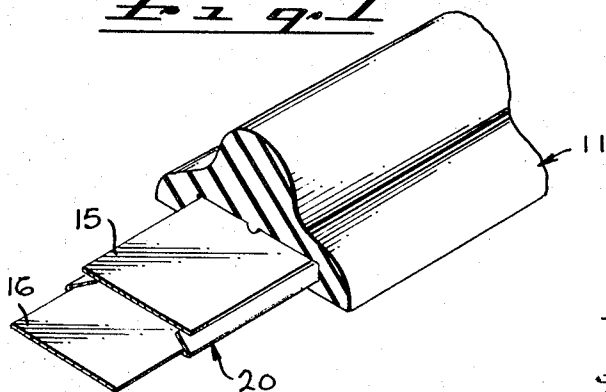


Fig. 5

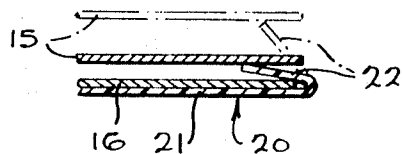


Fig. 2

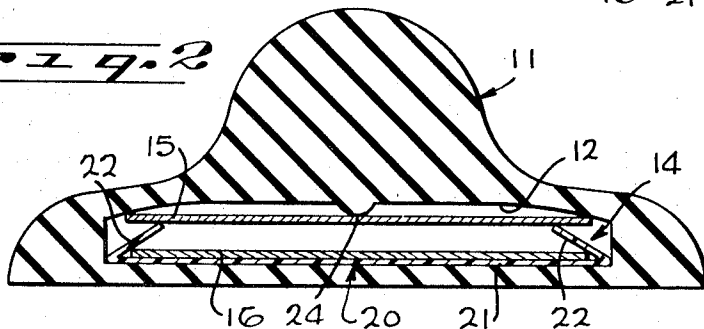


Fig. 3

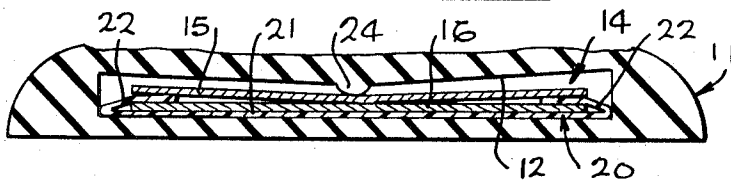
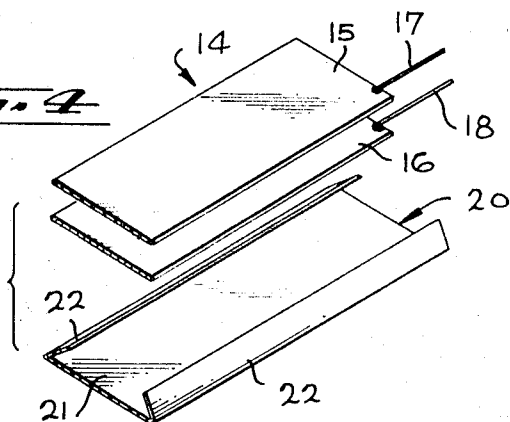


Fig. 4



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LINEAR SWITCH

This invention has to do with linear switches including treadle switches, ribbon and tape switches.

Linear switches are made for many purposes and consequently the sensitivity thereof varies widely depending upon the field of use and particular application. Some linear switches, such as treadle switches which are designed to be operated by motor vehicles driving over them, operate only upon the application of considerable weight or force thereto. On the other hand, many ribbon and tape switches are designed for applications where only slight pressure on the casing is required to operate the switch. One way of varying or adjusting the sensitivity of the switch is by choosing a casing of the required strength. However, this is a relatively inflexible method and has obvious disadvantages.

An object of the present invention is to provide a new and improved linear switch so constructed that sensitivity can be chosen or adjusted within a reasonable range at the time of assembly of the switch and apart from the casing. In this connection it is an object to provide a novel construction which inherently lends itself to producing a switch of given sensitivity within a wide range.

Another object is to provide a novel switch contact assembly for a normally open-type linear switch which may be embodied in various types of casings to produce linear switches for particular uses.

A further object is to provide a switch contact assembly in which novel means is provided for normally holding the conductor strips thereof in spaced relation;

These and other objects will be apparent from the drawings and the following description. Referring to the drawings:

FIG. 1 is a sectional isometric view of a portion of a linear switch embodying the invention;

FIG. 2 is a cross-sectional view of the switch of FIG. 1 but on a larger scale with the parts in normal position;

FIG. 3 is a fragmentary sectional view similar to FIG. 2 but showing the switch closed;

FIG. 4 is an exploded fragmentary sectional isometric view of the switch contact assembly; and

FIG. 5 is a fragmentary cross-sectional view of a portion of the switch contact assembly and a representation of a switch of different sensitivity shown in broken lines.

More particularly describing the invention, numeral 11 generally designates the casing of a linear switch that can be made of any length. The casing is normally made of rubber, synthetic rubber, neoprene or the like and is nonconductive and resilient, although only the upper portion thereof need be. The casing is provided with a cavity or interior compartment 12 in which a switch contact assembly, designated generally 14, is positioned. The assembly comprises two superposed conductor strips designated 15 and 16 respectively, each of which is provided with an insulated conductor at one end which leads through the casing to the exterior, the conductors being designated 17 and 18. The conductor strips may be made of brass or some other suitable electrically conductive metal and each is preferably flat or planar. Beyond one of the conductor strips is a nonconductive strip designated 20 which includes a flat main section 21 and intumed marginal flanges 22 at its side edge portions. The flanges form acute angles with

the main portion 21 and extend inwardly in between the two-conductor strips 15 and 16, thereby normally serving to hold them spaced apart as shown in FIG. 2 so that the switch is normally open. In the particular assembly shown, the nonconductive strip 20 is shown beneath the lowermost conductor strip 16. However, the assembly of the two-conductor strips and one nonconductive strip might be inverted in the casing. In order to facilitate closing of the switch when a weight or force is applied downwardly against the upper portion of the casing, the latter is provided with an internal rib or ridge, designated 24, which extends longitudinally of the case substantially over the center of the uppermost conductor strip 15. Thus when sufficient downward force is applied to the casing, it is deformed downwardly as shown in FIG. 3 and the rib 24 depresses and deflects the upper conductor strip into contact with the lower strip, thereby closing the switch.

The sensitivity of the switch is determined to a great extent by the characteristics of the nonconductive strip 20. This is preferably made of the plastic "mylar" which in sheet or strip form possesses some spring quality whereby the intumed flanges 22 serve as springs to yieldably hold apart the two-conductor strips. By varying the angle formed between each flange and the main body of the strip, the spacing of the two-conductor strips, and hence the sensitivity of the switch, is varied. For example, referring to FIG. 5, a relatively sensitive switch is illustrated in the full line position of the parts where it will be seen that the acute angle formed by the intumed flange illustrated with the main body of the nonconductive strip is only a few degrees and in consequence the spacing of the conductor strips is very slight. On the other hand, if the flanges 22 are formed to extend upwardly at a greater angle to the base or main portion of the nonconductive strip as shown in broken lines in the same figure, the upper conductor strip will be spaced much farther from the lower conductor strip as shown in broken lines, making the switch less sensitive. The sensitivity can also be varied by changing the thickness, strength and stiffness of the nonconductive strip 20.

I claim:

1. A linear switch contact assembly comprising a first-conductor strip, a second-conductor strip, and a nonconductive strip, said strips being superposed in the order mentioned, said nonconductive strip including a main flat portion and a pair of intumed opposing marginal flanges forming acute angles with the main flat portion, extending for a limited distance between said conductor strips and serving to yieldably hold the same in spaced relation.

2. A linear switch comprising:

- a body formed of nonconductive material having a central cavity therein;
- a lower conductor strip nonmovably positioned at the bottom of said cavity of said body and supported from the lower wall of said body;
- an upper conductor strip positioned within the cavity of said body in a normally spaced relationship with said lower conductor strip; and
- a single pair of yieldable flanges extending between said conductor strips for a limited distance, said flanges engaging said upper conductor strip and forming an acute angle with said lower conductor strip.

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