March 24, 1964 H. C. STEVENS, JR 3,126,467

WEATHERPROOFED CONTROL STATION FOR ELECTRICALLY-DRIVEN DEVICES

Filed June 21, 1960 2 Sheets-Sheet 1

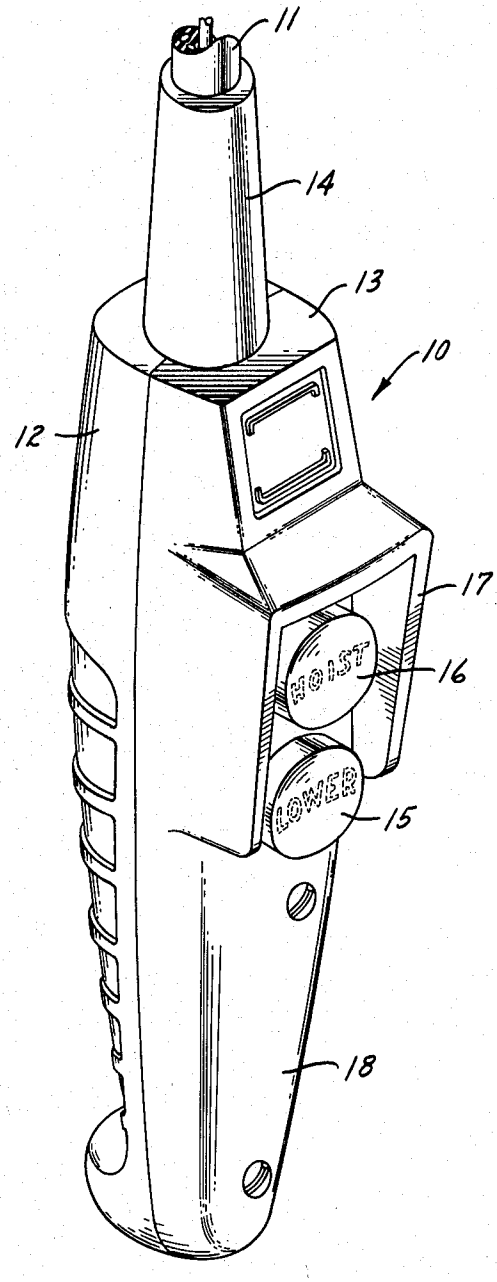


Fig. 1.

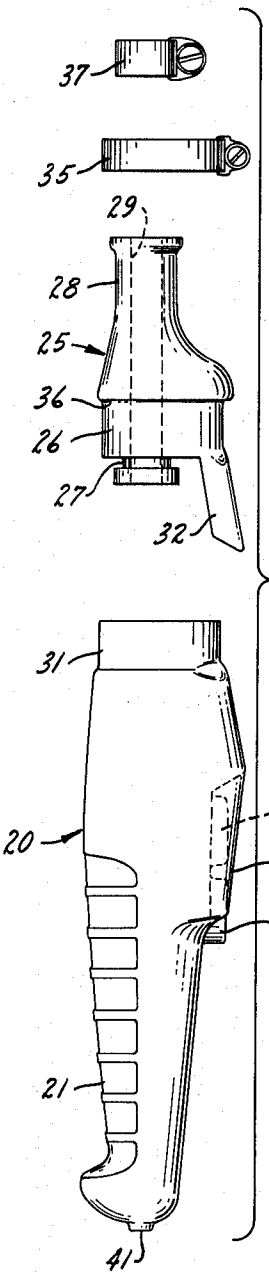


Fig. 2.

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Fig. 3.

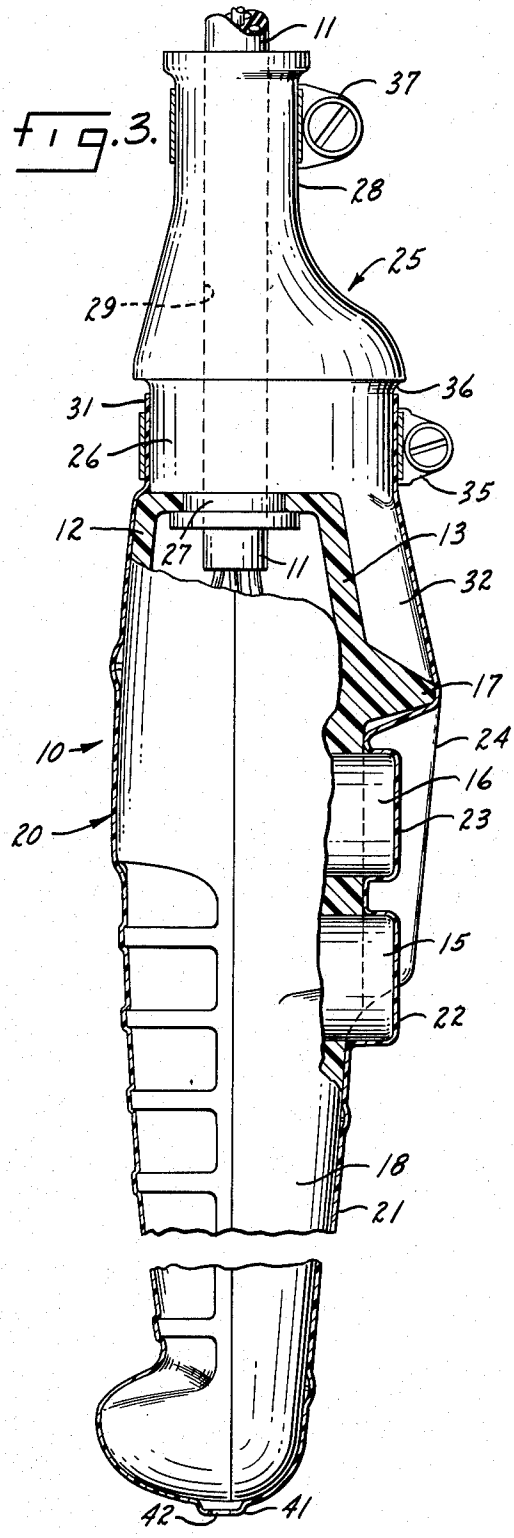
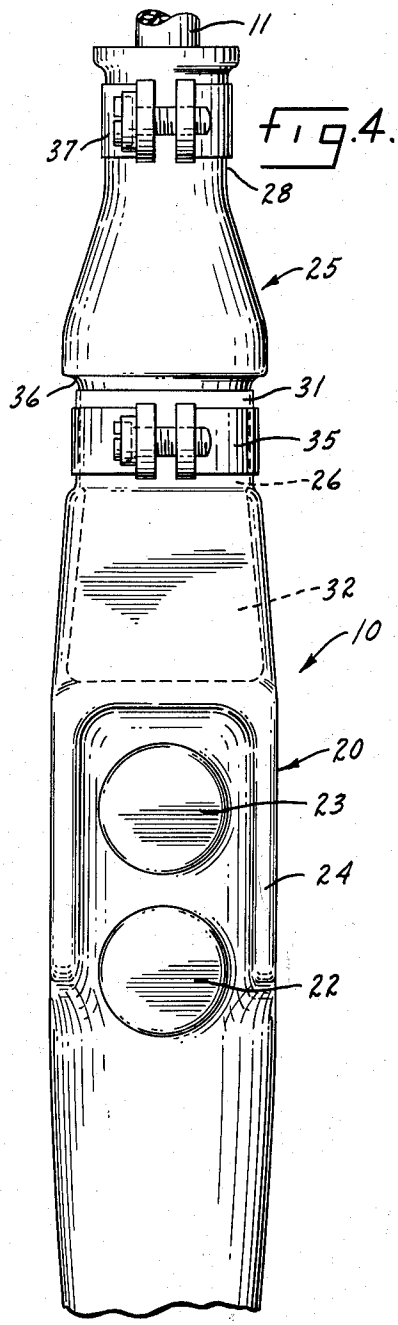


Fig. 4.



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United States Patent Office 3,126,467 Patented Mar. 24, 1964

3,126,467

WEATHERPROOFED CONTROL STATION FOR ELECTRICALLY-DRIVEN DEVICES

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Filed June 21, 1960, Ser. No. 37,620
5 Claims. (Cl. 200—168)

The present invention relates generally to control stations for operating electrically-driven devices such as electric hoists, and concerns, more particularly, an assembly for weatherproofing such stations.

It is common practice to provide overhead electric hoists with a depending control cable carrying a control station within easy reach of the hoist operator. The control station usually contains a switch or switches operated by a set of switch operators, such as pushbuttons, which may be manipulated by the operator. The operation of the hoist is thus controlled by the manipulation of the control station pushbuttons.

When the hoist is used out-of-doors or in a particularly humid or corrosive atmosphere, it is desirable to provide a weatherproofed control station, that is, one which prevents moisture or corrosive fumes from reaching and affecting the control switches. Control stations which are sealed against moisture and fumes have been known, but they are normally substantially more expensive than conventional stations.

Accordingly, it is the primary aim of the invention to provide a weatherproofing assembly for sealing a standard pushbutton control station against the effects of moisture or undesirable fumes.

An important object of the invention is to provide such a weatherproofing assembly which is very economical to manufacture and install so as to produce an exceptionally low cost weatherproofed station.

A further object is to provide an assembly as characterized above which does not affect the manipulation of the control station operators. In a particular case, the weatherproofing of a grip-type station having pushbutton switch operators permits the station to be gripped and the pushbuttons found and manipulated just as if the station were not weatherproofed.

It is also an object to provide a weatherproofing assembly of the above type which affords a tight effective seal.

Moreover, it is an object to provide an assembly of the above character which detracts little from the esthetic design of the control station.

Other objects and advantages of the invention will become apparent upon reading the following detailed description and upon reference to the drawings, in which:

FIGURE 1 is a perspective of a control station taken as exemplary of the type of station which can be weatherproofed by the practice of the present invention;

FIG. 2 is an exploded view of the parts used to weatherproof the station shown in FIG. 1 according to the invention;

FIG. 3 is an elevation, partially broken away and partially in section, showing the FIG. 2 elements mounted so as to weatherproof the FIG. 1 control station; and

FIG. 4 is a fragmentary elevation of the weatherproofed station shown in FIG. 3.

While the invention will be described in connection with a preferred embodiment, it will be understood that I do not intend to limit the invention to that embodiment. On the contrary, I intend to cover all alternatives, modifications and equivalents as may be included within the spirit and scope of the invention as defined by the appended claims.

Turning first to FIG. 1, there is shown a control station 10 which will be considered exemplary of the type of station which may be weatherproofed in accordance with the invention. The station 10 is mounted at the end of a control cable 11 which, in a normal case, depends from the electric hoist or other device controlled from the station 10.

The outer configuration of the control station is defined by a housing formed in two matching sections 12 and 13. A strain-relieving grommet 14 surrounds the cable 11 as it enters the housing sections 12, 13, and the grommet is preferably anchored to the housing.

To serve as operators, a pair of pushbuttons 15 and 16 protrude from the housing section 13 and, in the illustrated example, are operatively connected to electrical switches, not shown, which control the circuits running in the cable 11. To prevent inadvertent actuation of the pushbuttons 15, 16, the housing section 13 is formed with a guard flange portion 17 which surrounds the pushbuttons. The guard flange 17 provides an abutment preventing inadvertent depression of the pushbuttons 15, 16 should the control station 10 be casually grasped or swung against some object. The lower portion of the housing sections 12, 13 are configured to define a gripping handle 18 enabling the operator to easily grasp the station 10 and operate the pushbuttons 15, 16 with his thumb.

In accordance with the invention, the station 10 is weatherproofed by substituting for the grommet 14 a grommet having an enlarged sealing portion and closely enveloping the station with a contoured, flexible sleeve having its open top sealed to the grommet sealing portion. In the illustrated embodiment, a sleeve 20 of tough, flexible, transparent material such as polyvinyl chloride is contoured to conform very closely to the outer configuration of the station housing sections 12 and 13. The sleeve 20 thus includes a lower gripping portion 21, pushbutton protuberances 22 and 23, and an extending flange portion 24.

To replace the grommet 14, a grommet 25 is provided, preferably formed of resilient material, and defining a sealing portion 26 which, in the present case, is generally annular and which has a cross section approximately equal to the widest part of the control station 10. In the illustrated example, the widest portion of the control station 10 is approximately through the housing sections 12, 13 at the area of the guard flange 17 and therefore the cross section of the sealing portion 26 is preferably only slightly smaller than this widest portion of the station 10.

The grommet 25 also includes an anchoring groove 27 and a neck portion 28. A bore 29 to receive the cable 11 is formed longitudinally of the grommet.

The sleeve 20 includes an open topped skirt 31 shaped to fit closely about the sealing portion 26 of the grommet 25. Since the sealing portion 26 is approximately as wide as the widest portion of the station 10, it can be seen that the flexible sleeve 20 can be fitted over the control station with a minimum amount of stretching.

To fill in the space between the sealing portion of the

grommet 25 and the widest part of the station 10, the grommet is formed with a lip portion 32 having an outer surface contiguous with the surface of the sealing portion 26. The lip portion 32 is shaped to fill in that space extending above the guard flange 17 to the top of the housing section 13 (see FIG. 3).

The function of the parts thus far described can be best seen by briefly reviewing the steps for weatherproofing the control station 10. First, the sections 12, 13 of the control station housing are separated and the cable 11 and grommet 14 removed from the station. The conventional grommet 14 is slipped from the cable 11 and replaced by the grommet 25. The cable 11 is reconnected to the control station and the housing sections 12, 13 are reassembled with the annular groove 27 being locked between the housing sections. The flexible sleeve 20 is then pulled over the control station so that the sleeve gripping portion 21, pushbutton protuberances 22 and 23, and flange portion 24 closely surround and conform to the corresponding parts of the control station. The flexibility of the sleeve permits sufficient deflection to enable the sleeve to be pulled about the housing sections 12, 13 and this operation is facilitated by the skirt portion 31 being substantially as wide as the widest portion of the control station. When the sleeve 21 envelops the housing sections 12, 13, the skirt portion 31 closely surrounds the sealing portion 26 of the grommet 25.

For sealing the sleeve 20 to the grommet 25, a band clamp 35 is provided of sufficient size to fit about the sleeve skirt 31 and draw it tightly against the sealing portion 26 of the grommet. Preferably, the grommet 25 is also provided with a ledge 36 which overlies the sealing portion 26 so as to shield the open top edge of the skirt portion 31.

To seal the grommet 25 securely to the cable 11 and thus prevent leakage down along the cable into the control station 10, a second band clamp 37 is provided to fit about the neck portion 28 of the grommet and compress the grommet snugly against the cable 11.

In certain installations, it is desirable to provide for the release of water vapor which might be trapped within the sleeve 20 during installation and which could condense to affect the operating mechanism of the control station. For this purpose, the illustrated embodiment includes a small depression 41 formed at the bottom of the sleeve 20 which defines a moisture trap and which is provided with one or more small discharge openings 42 (see FIG. 3). Water vapor which condenses and tends to collect at the bottom of the sleeve 20 thus finds its way into the depression 41 and is discharged through the openings 42. In addition, the presence of the openings 42 tends to facilitate installation of the sleeve 20 since it permits the escape of air as the sleeve is pulled over the station housing sections 12, 13.

It will be appreciated that the weatherproofed station 10 is completely shielded from moisture or undesirable fumes by the sleeve 20. Since the sleeve 20 closely conforms to the shape of the control station and is of flexible material, the presence of the sleeve does not affect normal handling of the control station and manipulation of the pushbuttons 15, 16. Furthermore, since the sleeve 20 is preferably formed of transparent material and does conform to the outer shape of the control station, the weatherproofing elements detract very little from the esthetic design features of the control station.

Those skilled in the art will also understand that the components required to weatherproof the station in accordance with the invention can be manufactured very economically and can be quickly and easily installed so that a completely weatherproofed station can be obtained at exceptionally low cost.

The tight effective seal provided by the sleeve 20 is in large measure due to the close fit of the skirt portion 31 at the open end of the sleeve about the sealing portion 26 of the grommet 25. When clamped together by the band clamp 35, the skirt portion 31 does not wrinkle and hence no leakage paths are created between the sleeve 20 and the grommet 25.

I claim as my invention:

1. A weatherproofed control station assembly comprising, in combination, a station housing secured to one end of a control cable, an operator protruding from said housing for manual manipulation, a grommet surrounding said cable and being anchored to said housing, said grommet having a sealing portion adjacent said housing of approximately the same cross section as the widest part of said station assembly, a sleeve of flexible material closely enveloping said housing and the protruding operator, said sleeve having an open topped skirt portion closely surrounding said sealing portion of the grommet, and means for drawing said open top portion tightly against said grommet sealing portion.

2. A weatherproofed control station assembly comprising, in combination, a station housing secured to one end of a control cable, an operator protruding from said housing for manual manipulation, a grommet of resilient material surrounding said cable and being anchored to said housing, said grommet having a generally annular sealing portion adjacent said housing of approximately the same cross section as the widest part of said station assembly, a sleeve of flexible material closely enveloping said housing and the protruding operator, said sleeve having an open topped skirt portion closely surrounding said annular sealing portion of the grommet, said grommet having a ledge portion overlying said open topped skirt portion of the sleeve, and means for drawing said open top portion tightly against said grommet sealing portion.

3. A weatherproofed control station assembly comprising, in combination, a station housing secured to one end of a control cable, an operator protruding from said housing for manual manipulation, a grommet surrounding said cable and being anchored to said housing, said grommet having a sealing portion adjacent said housing, a sleeve of flexible, transparent material contoured so as to closely envelop said housing and the protruding operator, said sleeve having an open topped skirt portion closely surrounding said sealing portion of the grommet and a moisture releasing opening at the bottom of the sleeve, and means for drawing said open top portion tightly against said grommet sealing portion.

4. A weatherproofed control station assembly comprising, in combination, a station housing secured to one end of a control cable, an operator protruding from said housing for manual manipulation, said housing having a guard flange extending about said operator to prevent inadvertent operation, a grommet surrounding said cable and anchored to said housing, said grommet having a lip portion whose outer surface is contiguous with the surface of said grommet, said lip portion being shaped to fill in the space between the grommet and said extending flange, a sleeve of flexible material closely enveloping said housing and the protruding operator, said sleeve having a skirt portion closely surrounding said grommet, and means for drawing said sleeve tightly against said grommet.

5. A weatherproofed control station assembly comprising, in combination, a station housing secured to one end of a control cable, a plurality of operators protruding from said housing for selective manual manipulation, said housing having a guard flange extending about said operators to prevent inadvertent operation, a grommet surrounding said cable and anchored to said housing, said grommet having a sealing portion adjacent said housing of approximately the same cross section as the widest part of said station assembly, said grommet also having a lip portion whose outer surface is contiguous with the surface of said sealing portion, said lip portion being shaped to fill in the space between the grommet and said extending flange, a sleeve of flexible, transparent material closely enveloping said housing and the protruding operators,

said sleeve having an open topped skirt portion closely surrounding said sealing portion of the grommet, and means for drawing said open topped skirt portion tightly against said grommet sealing portion.

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