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CORD CONTROL MECHANISMS

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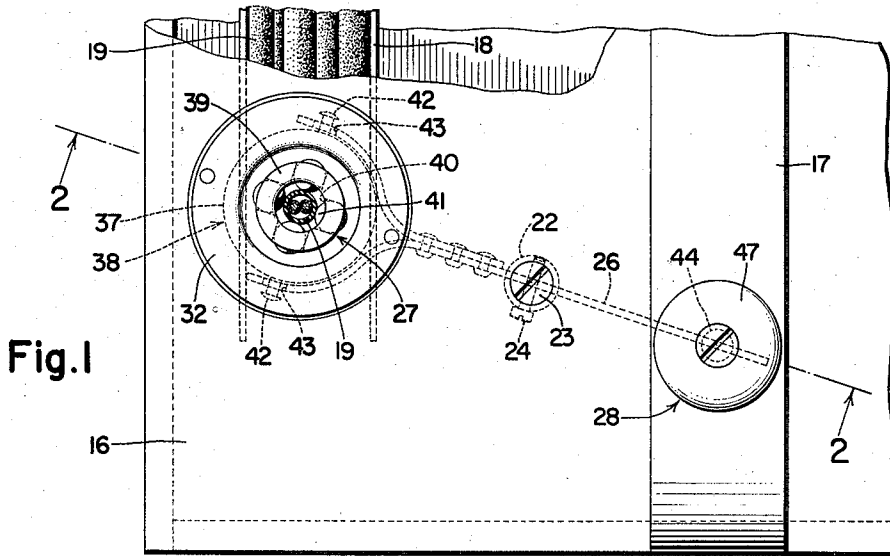


Fig. 1

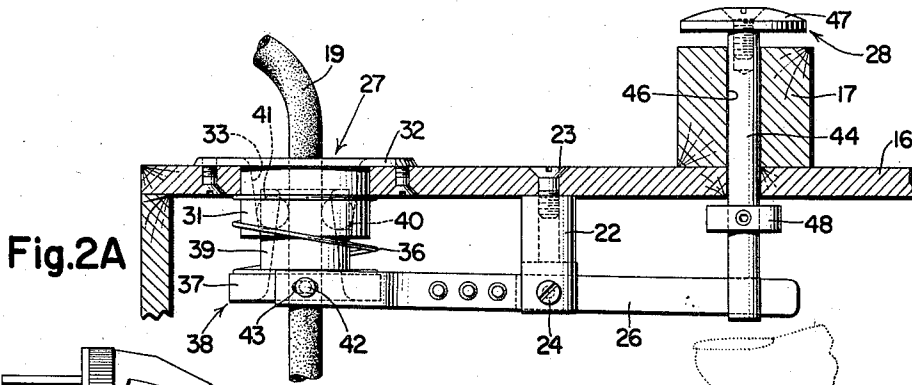


Fig. 2A

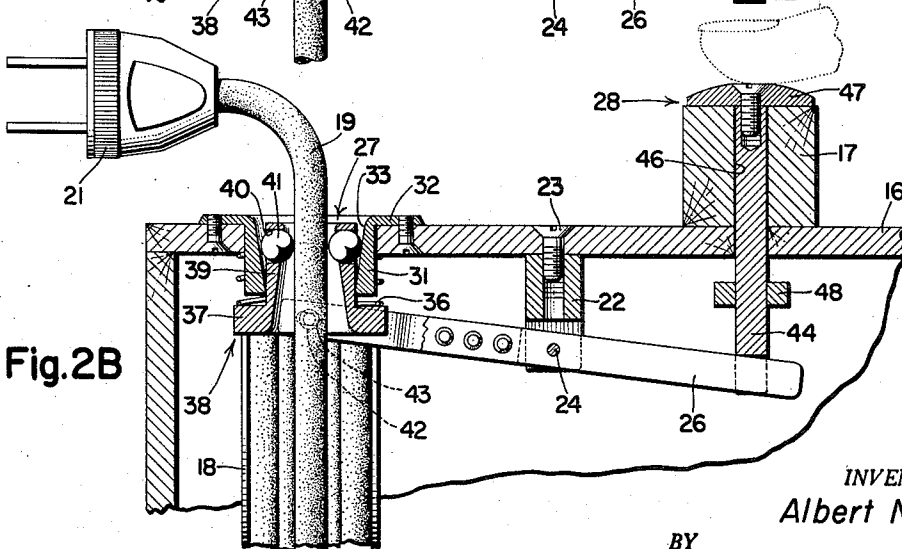


Fig. 2B

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## CORD CONTROL MECHANISMS

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1 Claim. (Cl. 188—65.1)

This invention relates to means for controlling an electric extension cord as it is unwound from and retrieved by a spring biased cord reel, and more particularly relates to a mechanism for stopping and gripping, and releasing the cord, and the primary object of the invention is to provide an improved device of this character.

Other important objects of the invention will be apparent from the following specification and claims.

In the single sheet of drawings, which forms a part of this specification:

Fig. 1 is a top plan view of a portion of a vacuum cleaner housing the cord control mechanism embodying the present invention, portions of the cover of the vacuum cleaner being broken away to disclose part of a cord reel,

Fig. 2A is a fragmentary sectional view taken substantially on the line 2—2 of Fig. 1, parts of the control mechanism being shown in elevation, and

Fig. 2B is a sectional view similar to Fig. 2A, except that elements of the mechanism are shown moved to the cord release position, and these elements are, for the most part, shown in cross section.

The vacuum cleaner, in which the subject cord control mechanism is housed, includes a top support-wall 16, a pick-up handle 17 secured to the top-wall 16, a spring biased take-up cord reel 18, and other items (not shown). Since the cord reel 18 may be of any known construction, for example, of a type similar to the cord reel illustrated in U.S. Patent No. 2,639,456, only a portion of the cord reel is shown in the drawings. The cord reel 18, in a known manner, is wound with a number of turns of an electric extension cord 19, to one end of which is attached an electric plug 21.

The cord control mechanism of the present invention comprises a depending lug 22 secured, by means of a screw 23, to the inner or lower surface of the top-wall 16. The lower end of the lug 22 is bifurcated and by means of a pivot screw 24 pivotally supports a control arm 26. One end of the arm 26 controls a ball-type cord gripping chuck 27 and the other end of the arm 26 is controlled by a push-button arrangement 28.

The ball-chuck 27 comprises a substantially cylindrical housing made up of an outer sleeve 31 capped by an external flange 32. The flange 32 is fastened to the top-wall 16 by a plurality of suitable screws, and the sleeve 31 which depends from the flange 32 passes through an appropriate hole in the top-wall 16. Preferably, the external surface of the sleeve 31 is cylindrical, whereas the interior surface 33 of the sleeve 31 is preferably frusto-conical, the previously mentioned flange 32 being located at the end of the sleeve 31 having the largest internal diameter. A helical compression spring 36 surrounds the sleeve 31. The upper end of the spring 36 engages the lower surface of the top-wall 16, and thus presses toward the flange 32 and the lower end of the spring 36 engages the upper surface of a flange 37 carried by the lower end of a ball retainer 38. Above the flange 37 the ball retainer 38 is in the form of a tube 39, the external surface of the tube 39 being cylindrical and slightly

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smaller in diameter than the smallest diameter of the interior frusto-conical surface 33 of the sleeve 31. This arrangement permits the tube 39 to move freely up and down within the sleeve 31. The inner surface of the tube 39 is downwardly divergent. Adjacent to the upper end thereof, the tube 39 is provided with four holes or apertures 40 equally spaced around the circumference of the tube 39. Each of the apertures 40 passes entirely through the wall of the tube 39, and each of the apertures freely supports a ball 41. The extension cord 19 passes through the tube 39 and between the balls 41. The external diameter of the cord 19, the external diameter of the balls 41, and the diameter of the inner frusto-conical surface 33 of the sleeve 31 are such that, when the spring 36 lowers the retainer 38 and the balls 41 to the position shown in Fig. 2A, the converging inner surface 33 of the sleeve 31 forces the balls 41 into gripping engagement with the external surface of the cord 19, thereby gripping the same. On the other hand, when the retainer 38 and the balls 41 are raised to the position shown in Fig. 2B, the grip of the balls 41 on the cord 19 is released, thereby allowing the cord 19 to be retrieved by the spring influenced reel 18.

In order to provide means for moving the ball retainer 38 from the spring-held position shown in Fig. 2A to the position shown in Fig. 2B, the flange 37 of the ball retainer 38 carries engaging means in the form of two diametrically disposed pins 42—42 which are received in elongated holes 43—43 formed in the bifurcated end of the control arm 26. The other end of the arm 26 is loosely received by the lower bifurcated end of a plunger 44 which forms part of the push-button 28. The upper end of the plunger 44 passes through a hole 46 in the top-wall 16 and the handle 17 and carries a screw held cap 47. Below the top-wall 16, the plunger carries a set screw held collar 48.

The mechanism described above operates in the following manner. Under normal circumstances the spring 36, the downward pull of gravity, and the downward pull of the reel 18 on the cord 19 causes the parts of the mechanism to assume the position shown in Fig. 2A. In this position, the balls 41 grip the cord 19 and prevent the cord reel 18 from retrieving the cord 19. When the cord is so held, a pull on the plug 21 and/or on the free end of the cord 19 causes the balls 41 to roll upwardly on the inner surface 33 of the sleeve 31. This frees the cord 19 from the grip of the balls 41 and allows the cord 19 to be unwound from the reel 18. If, as shown in Fig. 2B, the cap 47 of the push-button 28 is pushed, the plunger 44 moves the arm 26 about the pivot screw 24 and raises the ball-retainer 38. This releases the grip of the balls 41 on the cord 19 and allows the reel 18 to retrieve the cord 19.

Having thus set forth the nature of the invention, what I claim herein is:

1. In a vacuum cleaner having a wall provided with an upper and lower surface and having a plurality of holes passing through said wall; an extension cord control mechanism comprising a sleeve having an apertured flange resting on and secured to the upper surface of said wall, said sleeve extending downwardly through one of the holes in said wall, and said sleeve being provided with a downwardly converging frusto-conical interior; a ball retainer having a tube positioned within the frusto-conical interior of said sleeve, said tube being adapted to receive an extension cord and the upper portion of said tube where it is positioned within said sleeve having at least one radially extending aperture passing therethrough; a ball in said radially extending aperture, said ball engaging the frusto-conical interior of said sleeve and also being adapted to engage the external surface of the extension cord passing through said tube; a ball

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retainer flange formed on the lower end of said tube; a helical compression spring surrounding the lower end of said sleeve and engaging said ball retainer flange and biasing said ball retainer downwardly; a pair of pins placed diametrically opposite one another on said ball retainer flange; a forked control arm engaging said pins; means for pivotally mounting said control arm below the lower surface of said vacuum cleaner wall; a plunger extending through one of the holes in said wall and operatively engaging said control arm; and a push button attached to the upper end of the plunger which extends above the upper surface of said wall.

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