Jan. 13, 1970 B. J. TAMARIN 3,489,866

ELECTRICAL CORD REEL

Original Filed May 6, 1965 2 Sheets-Sheet 1

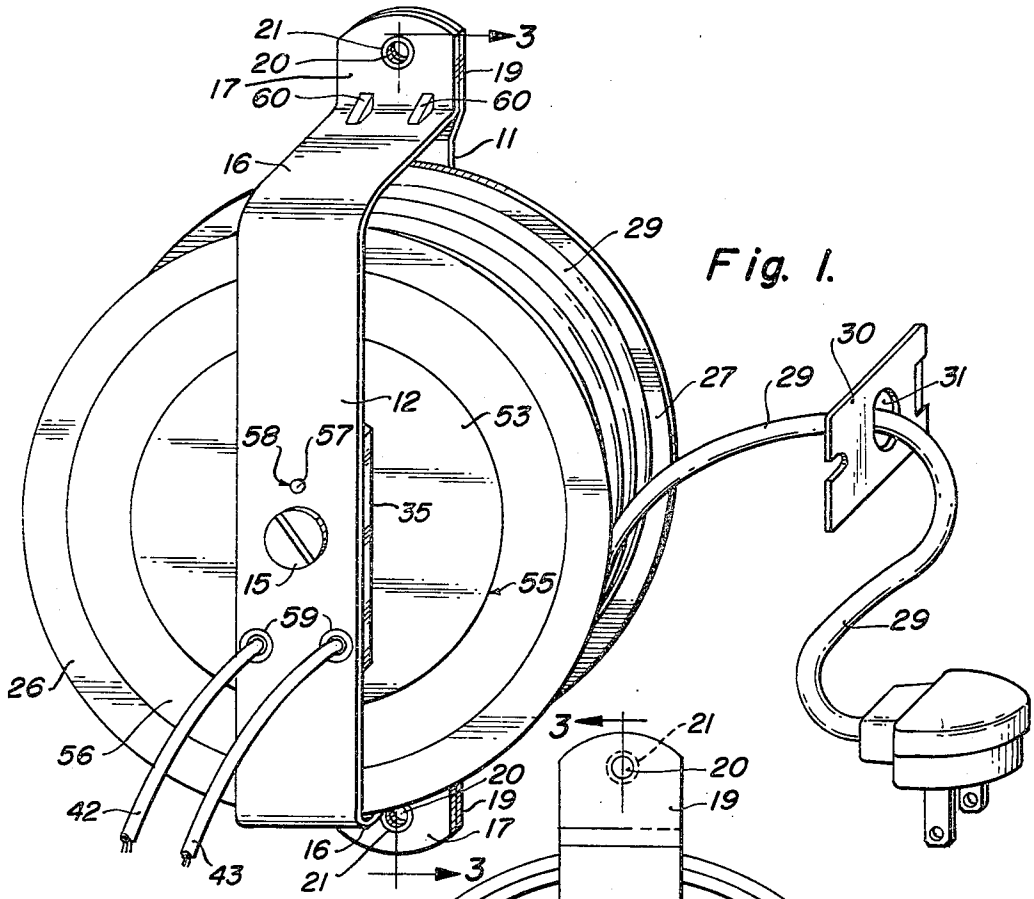


Fig. 1.

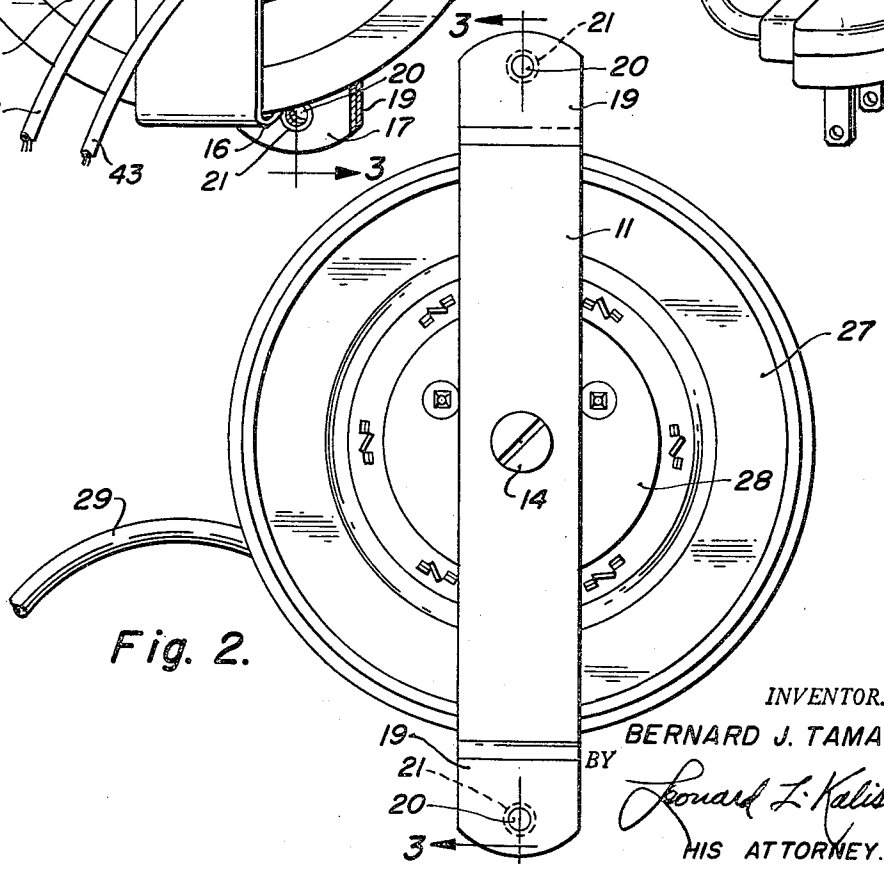


Fig. 2.

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Fig. 3.

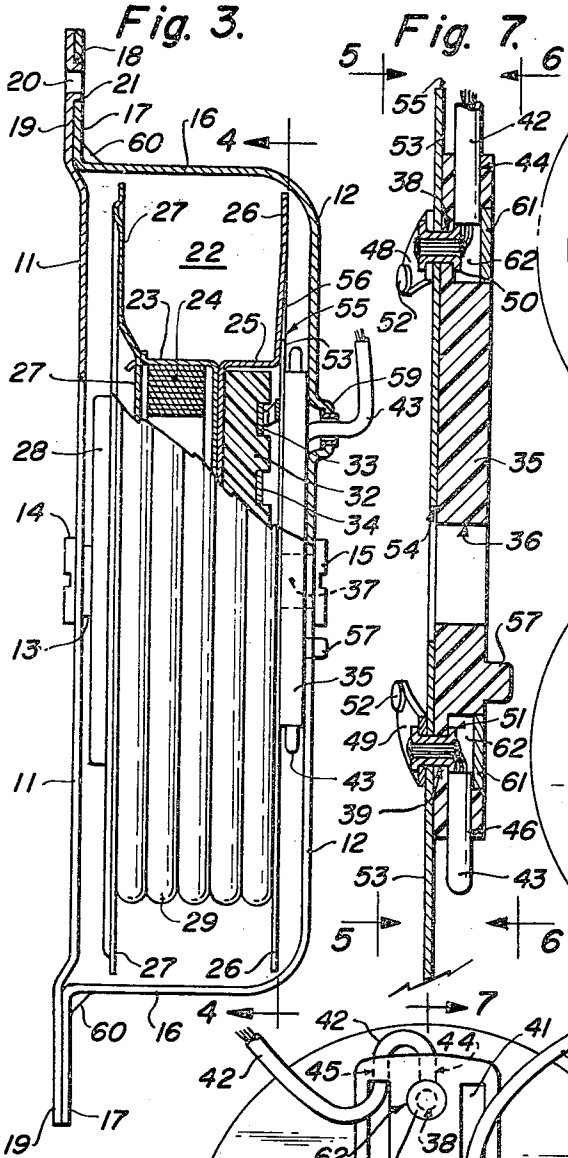


Fig. 7.

Fig. 4.

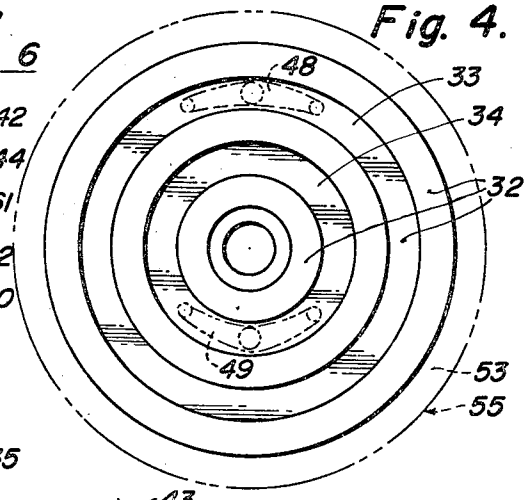
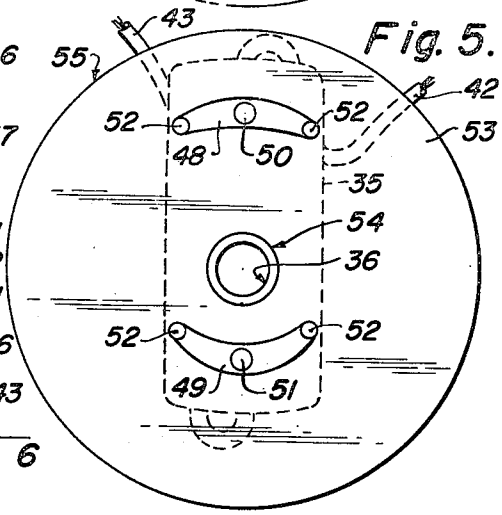


Fig. 5.



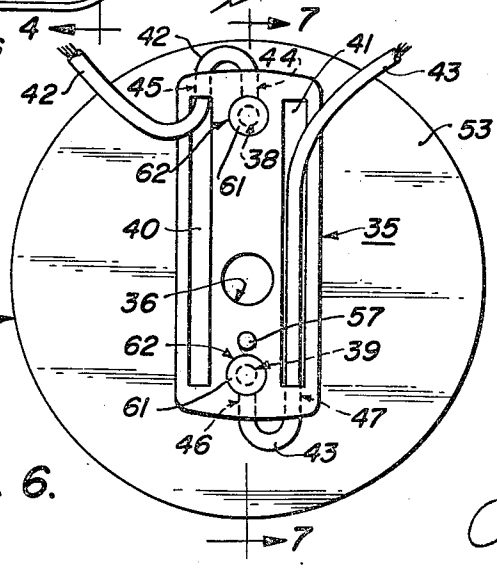


Fig. 6.

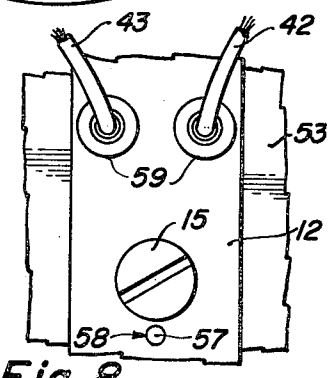


Fig. 8.

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United States Patent Office 3,489,866
Patented Jan. 13, 1970

3,489,866

ELECTRICAL CORD REEL

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Continuation of application Ser. No. 453,787, May 6, 1965. This application July 11, 1968, Ser. No. 747,024
Int. Cl. H02g *11/00;* F16j *15/34;* F16i *15/54*
U.S. Cl. 191—12.2 8 Claims

ABSTRACT OF THE DISCLOSURE

In an electric cord-reel, a thin circular dust-barrier disc formed of a form-retaining though transversely resilient insulating sheet material, such as a thin fiber-board, impregnated fiber sheet or plastic sheet, stationarily mounted to the stationary brush-block of the electrical cord-reel and to the electrical contact-brushes carried thereby, said dust-barrier disc having its inner portion supported by said brush-block and having an outer portion thereof extending radially outwardly from its inner block-supported portion and being unsupported in an axial direction except by the inner block-supported portion of the disc and being resiliently flexible in an axial direction in relation to such inner portion of the disc and having an annular peripheral portion bearing resiliently against the face of the juxtaposed cord-retaining flange of the rotary cord-take-up adjacent the collector-ring chamber in the hub of the cord-take-up.

This application is a continuation of my copending application Ser. No. 453,787, now abandoned.

The present invention relates to electric cord-reels generally of the type exemplified by the electric cord-reels of U.S. Patents 2,391,840, 2,443,701 and 2,521,178, and has for its object the better maintenance of good electrical contact between the electrical brushes and the electric collector-rings, without any attention thereto by the user, and the prevention of the accidental intrusion of foreign objects into the zone of said rings and brushes, and to shield the electric collector-rings and brushes from metal and carbon dust which may cause an electrical shorting or leakage, and also to shield same from non-conductive dust which may impair the electrical contact between the collector-rings and brushes.

In electrical cord-reels the contact between the electrical brushes and the electrical collector-rings tends to deteriorate in time due to dust gathering on such collector-rings and brushes, which dust tends to interfere with the electrical contact therebetween, and also tends to create wear. Dust particles also tend to absorb and render less effective the film of lubricant which is applied to the collector-rings in the course of the manufacture of the cord-reel, thus further tending to render the electrical collector-rings and brushes less effective in the course of time. If on the other hand the dust is of metal or carbon, then in time the danger of an electrical shorting or leakage develops.

One of the objects of the present invention is a simple and inexpensive dust-guard construction in electric cord-reels, which permits more ready and quick assembly in relation to the electrical brushes and the brush-mounting insulator-block, and which will be effective without deterioration over long periods of time.

The further object of the present invention is a generally simplified, less expensive and yet effective cord-reel construction and the mounting thereof.

The above and other objects will appear more fully from the following description and the accompanying drawings, in which like reference characters indicate like parts.

FIGURE 1 represents a front perspective view of a cord-reel exemplifying an embodiment of the present invention.

FIGURE 2 represents a rear elevational view of the same.

FIGURE 3 represents an elevational view of a cord-reel embodying the present invention, partly in section on lines 3—3 of FIGURES 1 and 2.

FIGURE 4 represents a view of the collector-rings and the disc-like insulating member in and to which they are mounted—viewed normal to the plane of said rings and of said insulating disc (the spacial relationship of the brushes and of the dust-guard disc being indicated in dotted lines).

FIGURE 5 represents a similar view of the electrical brushes and the dust-stop or dust-guard disc to which they are mounted—viewed generally on line 5—5 of FIGURE 7.

FIGURE 6 represents an elevational view, on line 6—6 of FIGURE 7, of the outer face of the brush-mounting block and the dust-guard disc.

FIGURE 7 represents a section on line 7—7 of FIGURE 6, on an enlarged scale.

FIGURE 8 represents a fragmentary view of a detail of the invention.

In the embodiment of the present invention shown in the drawings, the electric cord-reel includes two arbor-supporting band-like or strap-like sheet-metal members or plates **11** and **12**, between which the opposite ends of the stationary arbor **13** are secured by means of the screws of **14** and **15** which are threaded into threaded axial holes in the ends of the arbor—the end of the arbor mounted to the plate **11** having a "flat" thereon and the plate **11** having a corresponding elongated hole therein in which such "flat" nests, so as keyingly to interlock the arbor **13** and the strap **11**, to prevent the arbor from rotating in relation to the strap **11**.

The strap **12** has a pair of opposite portions **16** bent at a right angle to the main body of the strap **12**, and the portions **16** flank the reel at diametrically opposite portions thereof, as shown particularly in FIGURES 1 and 3. From each of the reel-flanking portions **16**, a securing-tab **17** is bent outwardly as indicated in FIGURES 1 and 3, and each of the securing-tabs **17** is provided with a hole **18**. The band strap **11** is provided with offset securing tab portions **19**, and these tabs are provided with holes **20** flanked by a slight tubular projection **21** drawn from the tabs **19** (around the holes **20**) and these tubular projections **21** nest in the holes **18** in the mounting tabs **17**, thereby to dowel the mounting-tabs **17** and the mounting-tabs **19** to each other.

The cord-storing reel designated generally by the numeral **22** includes a dished spring-housing member **23** in which the cord-retrieving or cord-winding spring **24** is operatively mounted, with its outer end anchored to said dished spring-housing member and with its inner end anchored to the arbor **13**. The cord-storing reel **22** further includes a dished insulator-receiving member **25** secured to the dished spring-housing member **23** and having a cord-retaining flange **26**. The cord-storing reel **22** further includes a spring-enclosing and cord-retaining disc **27** secured to the open side of the dished spring-housing member **23** in the manner indicated in FIGURES 2 and 3.

A dished latch-housing **28** is secured to the disc **27**, and within said housing **28** any suitable reel locking and releasing mechanism may be provided for retaining the reel **22** against cord-retrieving rotation by the spring **24** and optionally to release said cord-reel **22** so as to permit the spring **24** to retrieve the cord thereon. Details of such locking and releasing mechanism are not shown because same may be any conventional reel locking and

releasing mechanism, as, for instance, the mechanisms shown in U.S. Patents 2,391,840 and 2,521,178.

The electrical cord **29** is disposed on the cord-reel **22** in the manner indicated in FIGURES 1 and 3 and is paid out tangentially through any suitable cord-pay-out member **30** mounted in or to the housing of the appliance in which the cord-reel is installed, with the axis of the hole **31** thereof generally tangent to the reel. An anti-friction bushing, grommet or eyelet (not shown) may be provided in the hole **31**.

The inner end of the cord **29** extends radially inwardly through the hub-portion of the dished member **25** and then into the round insulating-block **32** mounted to or nested in the dished member **25**, where the individual wires thereof are soldered to the collector-rings **33** and **34** in any conventional manner (not shown).

A brush-carrying block **35**, formed of insulating material (such as a molded plastic), is shown in FIGURE 7 on a scale approximately twice that of FIGURES 3, 5 and 6. The brush-block **35** includes a central opening **36** through which the cylindrical terminal portion **37** of the arbor **13** extends—the hole **36** of the brush-block **35** being centered by the arbor-end **37** nested therein. Rivet-holes **38** and **39** extend through the block **35**, spaced from the axis of the hole **36** at the respective radial distances of the collector-rings **32** and **33**, as indicated in FIGURES 4 and 7.

The brush-block **35** also includes grooves **40** and **41**, recessed into the outer face thereof, in which grooves the stationary electrical leads **42** and **43** are adapted to nest, as indicated in FIGURE 6.

A hole **44** extends from the rivet-hole **38** through the end of the brush-block **35** and another hole **45** extends from the end of the brush-block into the groove **40**, so that the electrical lead **42** may first pass from the rivet in the hole **38** outwardly and then back into the groove **40**. Similar holes **46** and **47** are provided at the other end of the brush-block **35** for the like passage of the electrical lead **43** from the rivet in the hole **39** into the groove **41**.

The two-pronged electric-contact brushes **48** and **49** are made of flat spring bronze or like spring-metal and have square rivet-receiving holes therethrough in the central portions thereof with small outwardly turned keying tabs bent from two sides of each square hole in the center of each brush and extending into the square rivet holes in the brush-block **35**, so as to prevent the brushes from turning in relation to the brush-block. The hollow tubular rivets **50** and **51** extend through the said rivet-holes in the brushes and through the rivet-holes **38** and **39** in the brush-block and are riveted over to secure the brushes to the block.

To the opposite ends of each of the brushes **48** and **49**, silver or similar contact-members **52** are mounted for more effective electrical sweep-contact with the collector-rings **33** and **34**.

The ends of the metallic conductor-wires within the leads **42** and **43** are extended through the hollow tubular rivets **50** and **51** and are soldered therein.

Between the riveted central portions of the brushes **48** and **49** and the juxtaposed inner face of the brush-block **35**, a dust-stop or dust-guard disc **53** is operatively disposed, as indicated in FIGURES 1, 3, 5, 6 and 7—said disc being formed of a form-retaining though slightly resilient insulating material (such as thin fiber-board, impregnated fiber or plastic).

Disc **53** has a central opening **54** therein to clear the arbor-end **37** and corresponding generally to the arbor-hole **36** in the brush-block **35**. The outer periphery **55** of the disc **53** bears resiliently against the slightly concave face **56** of the cord-retaining flange **26**, with just sufficient pressure to form a dust-seal, but not with sufficient force to impose any significant braking action on the reel **22**.

A keying knob **57** is provided on the outer face of the brush-block **35**. The knob **57** passes through or nests in a corresponding hole **58** in the flat arbor-supporting strap-like member **12** and thus prevents the brush-block **35** from rotating.

The stationary electrical leads **42** and **43** pass through perforated and grommeted bosses **59** in the flat band **12**, and may have attached to their ends any suitable electrical plug (not shown), or said leads **42** and **43** may be directly connected to corresponding electrical terminals on the appliance to be served by the electrical cord-reel.

By means of the disc **53**, the electrical contact-rings **33** and **34** and the brushes **48** and **49** are sealed off from the exterior, in a manner which substantially prevents the ingress of dust into the zone of said rings and brushes, thus preserving their electrical effectiveness against deterioration due to dust.

The disc **53** also serves as an electrically insulating guard to prevent accidental contact with the collector-rings and brushes by any foreign object, such as a screw-driver, nail or stray piece of wire.

Pairs of stiffening webs **60** are formed between the portions **16** and the securing-tabs **17** of the arbor-supporting band or plate **12**.

The completed reel may be mounted to any suitable wall of the appliance which the cord-reels serve, by screws or other fastening means extending through the holes **20**.

If the reel locking-and-releasing mechanism (within the housing **28**) is of the gravity type, then the reel should be mounted in a vertical position as indicated in FIGURE 3. If, however, the reel locking-and-releasing mechanism is of the type shown in FIGURES 2, 3 and 4 of Patent 2,391,840 and in FIGURES 4 and 5 of Patent 2,521,178 then the cord-reel may be mounted to a horizontal or inclined surface (as well as to a horizontal surface).

Insulating discs **61** of compressed fiber sheet material or the like, preferably coated with a suitable wax or an analogous material, are press-fitted into the round enlarged chambers **62** in the insulator-block **35**, to provide an insulating closure for the outer ends of the rivets **50** and **51** and the electrical conductors soldered thereto, as indicated particularly in FIGURES 6 and 7. By applying a slight amount of heat to the discs **61** as they are press-fitted into the chambers **62**, the wax is momentarily melted and then resolidified, so as to adhere to the interior surface of the chambers **62**.

Having shown and described an embodiment of my invention, I claim the following:

1. In an electrical cord-reel including a spring-retracted rotary cord-take-up having a cord-winding hub, a pair of spaced-apart cord retaining flanges extending radially outwardly from the hub, a collector-ring chamber in one end of the hub, extending axially inwardly from the cord-retaining flange at such end of the hub and having two electrical collector rings operatively mounted therein, a dielectric brush-block stationarily mounted in relation to the cord-take-up and in operative juxtaposition to said collector rings and electrical brushes carried by said brush-block in operative juxtaposition to said collector rings, a thin form-retaining though transversely resilient insulating dust-barrier disc having its generally central inner portion stationarily mounted to and between said brush-block and said electrical brushes, fastening means securing said electrical brushes and said brush-block to each other and stationarily clamping the generally central portion of said dust-barrier disc between said electrical brushes and said brush-block, said dust-barrier disc having an outermost annular portion thereof extending radially outwardly from its inner block-supported portion and being unsupported in an axial direction except by said generally central clamped portion of the disc and being resiliently flexible in an axial direction in relation to such inner portion of the disc; such unsupported outer annular portion of the disc bearing resiliently against an annular portion of the face of the juxtaposed cord-retaining flange of the rotary cord-take-up spaced radially outwardly from the collector-ring chamber in the hub there-

of, whereby said resilient dust-barrier disc may compensate for wear in the contact between the disc and the flange.

2. In an electrical cord-reel including a spring-retracted rotary cord-take-up having a cord-winding hub, a pair of spaced-apart cord-retaining flanges extending radially outwardly from the hub, a collector-ring chamber in one end of the hub, extending axially inwardly from the cord-retaining flange at such end of the hub and having two electrical collector-rings operatively mounted therein, a dielectric brush-block stationarily mounted in relation to the cord-take-up and in operative juxtaposition to said collector-rings and electrical brushes carried by and affixed to said brush-block in operative juxtaposition to said collector-rings, a thin form-retaining though transversely resilient insulating dust-barrier disc having its generally central inner portion operatively mounted to said brush-block and stationarily held in place by said brush-block and extending radially outwardly from said brush-block and brushes into operative juxtaposition to said collector-ring chamber and forming a cover over said chamber, said disc being so disposed that the collector-rings and brushes are enclosed by said disc, said dust-barrier having an outermost annular portion thereof extending radially outwardly from its inner block-mounted portion and being unsupported in an axial direction except by said generally central block-mounted portion of the disc and being resiliently flexible in an axial direction in relation to such inner portion of the disc; such unsupported outer annular portion of the disc bearing resiliently against an annular portion of the face of the juxtaposed cord-retaining flange of the rotary cord-take-up spaced radially outwardly from the collector-ring chamber in the hub thereof, whereby said resilient dust-barrier disc may compensate for wear in the contact between the disc and the flange, said disc shielding said collector-rings and brushes.

3. In an electrical rotary cord-reel including a cord-winding hub and a pair of cord-confining flanges extending radially outwardly therefrom, electrical collector rings operatively mounted in said hub adjacent one of said flanges, a dielectric brush-block having electrical brushes secured thereto and stationarily mounted in operative juxtaposition to said rings; a thin form-retaining though transversely resilient insulating dust-barrier disc, means mounting the generally central portion of said disc to

said brush-block with said brushes exposed on one side of said disc, said disc including an unsupported annular portion extending radially beyond said disc-mounting means which is flexible in an axial direction and bears resiliently and slidably against an annular portion of the confronting face of said one flange with sufficient pressure to form a dust seal but insufficient to impose a significant braking action on the reel.

4. The combination of claim 3 wherein said one flange is slightly concave.

5. The combination of claim 3 wherein said disc-mounting means also secures said electrical brushes to said brush-block.

6. The combination of claim 3 wherein said disc is made of plastic.

7. The combination of claim 3 wherein said disc is made of fiber-board.

8. In an electrical rotary cord-reel including a cord-winding hub and at least one cord-confining flange extending radially outwardly therefrom, electrical collector rings mounted in said hub, a dielectric member having electrical brushes secured thereto in stationary operative juxtaposition to said rings, a thin form-retaining though transversely resilient insulating plastic dust-barrier disc, means non-rotatably supporting said disc at its generally central portion on said dielectric member without obstructing contact between said brushes and rings, said disc including an unsupported annular portion extending radially beyond its central supported portion and which is flexible in an axial direction and bears resiliently and slidably against an annular portion of said flange.

References Cited

UNITED STATES PATENTS

2,443,701	6/1948	Tamarin	191—12.2
3,167,161	1/1965	Appleton	191—12.2
2,750,215	6/1956	Bermingham	277—65

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U.S. Cl. X.R.

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