

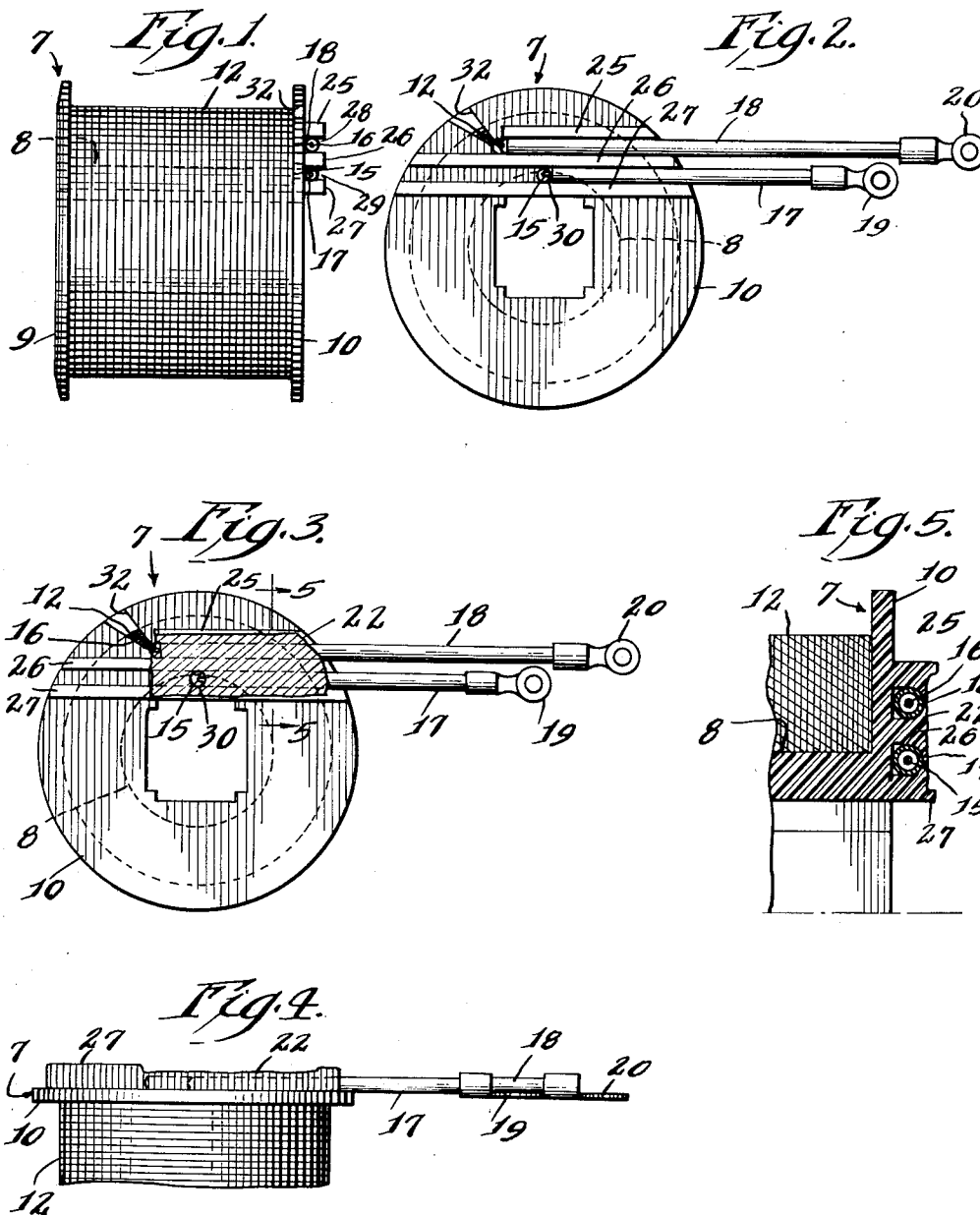
Sept. 12, 1961

J. F. WAHL

2,999,962

COIL CONSTRUCTION

Filed June 10, 1957



Inventor.
John F. Wahl.

By. Zabl, Baker, York, Jones & Rothman
Attorneys.

1

2,999,962

COIL CONSTRUCTION

John F. Wahl, Sterling, Ill., assignor to Wahl Clipper Corporation, Sterling, Ill., a corporation of Illinois
Filed June 10, 1957, Ser. No. 664,673
2 Claims. (Cl. 317-158)

This invention relates to a coil construction, and more particularly to an arrangement for the lead or terminal wires of an electromagnetic coil.

Electromagnetic coils of the type used in many vibrating appliances comprise numerous turns of small diameter wire wound on a spool. Such wire is weak in structural strength and subject to breakage during assembly or use of the appliance. The lead or terminal ends of this wire necessarily are connected to other circuit elements within the appliance and it is essential that they be given a strain-resistant characteristic.

One object of the invention, therefore, is to provide a coil construction wherein a strain-resistant quality is imparted to the wire leads.

Another object of the invention is to provide a coil construction wherein the wire leads are enclosed in sleeves which are in part integral with the spool on which the wire is wound.

Another and more detailed object of the invention is to provide a coil construction wherein one end face of the coil spool is provided with grooves which receive portions of sleeves which enclose the lead ends of the coil, the sleeve portions being integral with the spool material which defines the grooves.

The construction of this invention eliminates the need for providing separate strain-resistant conductors, and greatly reduces the labor and time previously required for fabricating coils with strain-resistant leads.

Other objects, advantages and details of the invention will be apparent as the description proceeds, reference being had to the accompanying drawing wherein one form of the invention is shown. It will be understood that the description and drawing are illustrative only and that the scope of the invention is to be measured by the appended claims.

In the drawing:

FIG. 1 is a front elevational view of a coil construction embodying the invention, the structure being illustrated at an intermediate step in fabrication;

FIG. 2 is an end elevational view of the construction shown in FIG. 1;

FIG. 3 is an end elevational view of the finished construction;

FIG. 4 is a top plan view of a fragmentary portion of the finished construction, and

FIG. 5 is an enlarged sectional view on line 5-5 of FIG. 3.

Referring now to the drawing, a coil construction embodying the invention includes a spool 7 having a hollow core 8 and two end portions 9 and 10. A metallic core (not shown) subsequently is received within spool core 8.

At least one of the spool end portions, for example end portion 10, is made of fusible material such as one of the polymeric amides (nylon). In practice, the entire spool including core and end portions is molded of such material, although the invention in its broadest aspect may be practiced with a spool having only a single fusible end portion or a spool having a part of an end portion of fusible material.

Wire 12 is wound in many layers on core 8 between end portions 9 and 10, it being noted that wire 12 ordinarily is of small diameter and of poor strain-carrying capability.

Wire 12 has two end lengths which serve as leads for the coil, namely an inner or underlying end length 15

2

and an outer end length 16. Both end lengths of wire 12 are disposed to lie adjacent a fusible end portion of spool 7. As here shown, both wire end lengths are positioned adjacent end portion 10 of the spool, although one end length might be positioned adjacent one end portion and the other end length positioned adjacent the other end portion, if desired, provided, of course, that both end portions are made of fusible material in whole or in part.

A sleeve 17 of fusible material encloses inner end length 15 of wire 12 and a sleeve 18 encloses outer end length 16 of wire 12, the sleeves being coextensive with the respective end lengths and lying adjacent fusible end portion 10. Sleeves 17 and 18 are made of a fusible material such as a vinyl resin which has softening and melting temperatures of the same order as those of the fusible end portion or portions of spool 7.

Sleeves 17 and 18 extend to the free ends of the respective inner and outer end lengths 15 and 16 of the wire and are provided at the free ends with terminal members 19 and 20 which are mechanically connected to the sleeves and electrically connected to the wire ends.

The portions of sleeves 17 and 18 adjacent the end portion or portions of spool 7 are made integral with the adjacent end portion by application of sufficient heat to soften and melt the fusible material in both the sleeves and adjacent spool end portions. The fusing heat is applied in a localized manner by suitable means such as a soldering iron or application of a beam of infrared heat. The materials quickly soften and melt upon being heated and fuse together quickly when the heat source is removed. Irregular surface 22 in FIGS. 3-5 illustrates the structure following application and removal of the heat.

In the form of the invention here illustrated, spool end portion 10 is provided on its outer face with three spaced parallel ribs 25, 26 and 27 of fusible material. These ribs define a pair of grooves 28 and 29 (FIG. 1) which receive portions of the sleeves 17 and 18. As shown in FIG. 1, sleeve 17 and its enclosed inner end length 15 lies within groove 29 between ribs 26 and 27 and sleeve 18 and enclosed outer end length lie in groove 28 between ribs 25 and 26.

Ribbed end portion 10 has an aperture 30 therethrough which leads to groove 29, and inner end length 15 of wire 12 extends through this aperture so the wire and its associated sleeve may occupy the groove.

The periphery of end portion 10 has a notch 32, and outer end length 16 of the coil wire passes through this notch and into groove 28.

FIGS. 3-5 illustrate the character of the construction after the application of heat. As will be observed, the fusible material of the ribs and the fusible material of the adjacent sleeves are joined together into an integral whole. Thus, sleeves 17 and 18 serve to carry whatever strain is experienced during assembly and use, and the enclosed wire is essentially strain-free. Further, minimum labor and time is involved in the construction.

From the above description it is thought that the construction and advantages of the invention will be readily apparent to those skilled in the art. Various changes in detail may be made without departing from the spirit or losing the advantages of the invention.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A coil construction comprising a spool having a core and two end portions of electrical insulating material, wire wound on said core between said end portions, at least three spaced parallel ribs of fusible material on the outer face of one of said end portions, said ribs defining two elongated grooves, said ribbed end portion having an aperture therethrough leading to one of said grooves, the inner end length of said wire extending through said aperture

3

and lying in said one groove, the outer end length of said wire lying in the other of said grooves, a sleeve of fusible electrical insulating material on each end length of said wire and lying in part in the respective grooves, said sleeves each having a free end beyond said grooves, a terminal member mechanically fixed to the free end of each sleeve and electrically connected to the wire therein, said ribs and portions of said sleeves between said ribs being in fused relation with each other, whereby strain between said spool and said terminal members is carried by said sleeves and said wire end lengths are free of strain.

2. A coil construction comprising a spool having a core and two end portions of electrical insulating material, wire wound on said core between said end portions, one of said end portions being of fusible material and having two grooves on the outer face thereof, said one end portion having an aperture therethrough leading to one of said grooves, the inner end length of said wire extending through said aperture and lying in said one

4

groove, the outer end length of said wire lying in the other of said grooves, a sleeve of fusible electrical insulating material on each end length of said wire and lying in part in the respective grooves, said sleeves each having a free end beyond said grooves, a terminal member mechanically fixed to the free end of each sleeve and electrically connected to the wire therein, portions of said sleeves within said grooves being in fused relation with said one end portion, whereby strain between said spool and said terminal members is carried by said sleeves and said wire end lengths are free of strain.

References Cited in the file of this patent

UNITED STATES PATENTS

1,517,770	Ziegler	Dec. 2, 1924
2,339,432	Stahl	Jan. 18, 1944
2,534,119	Gethmann	Dec. 12, 1950
2,753,533	Houser	July 3, 1956