

Oct. 20, 1942.

J. B. SEEVER

2,299,113

COIL FORM AND THE LIKE

Filed Dec. 8, 1939

2 Sheets-Sheet 1

Fig. 1.

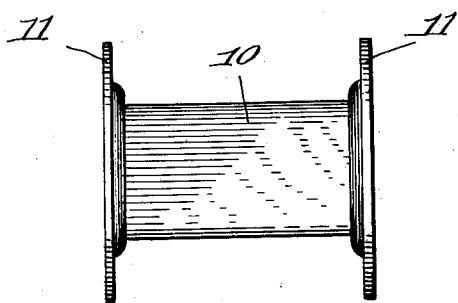


Fig. 2.

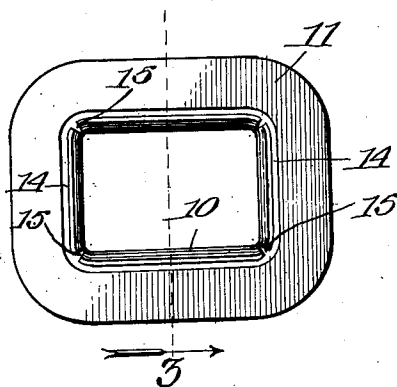
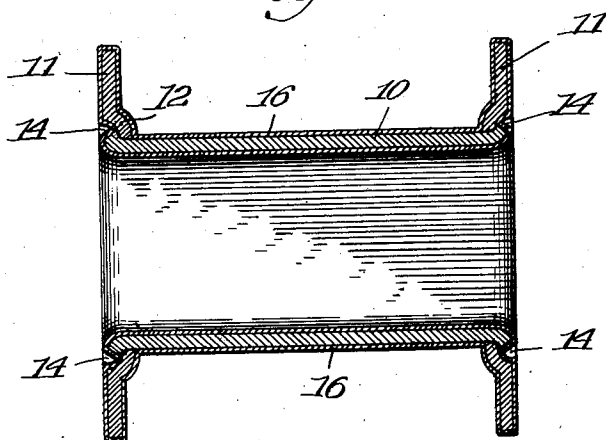


Fig. 3.



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Fig. 4.

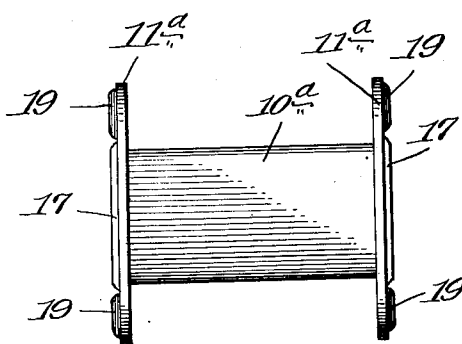


Fig. 5.

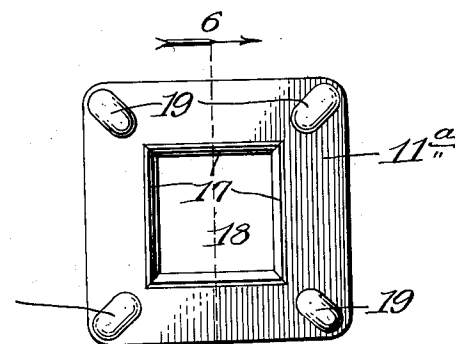


Fig. 6.

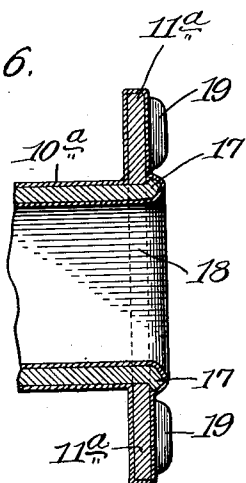


Fig. 7.

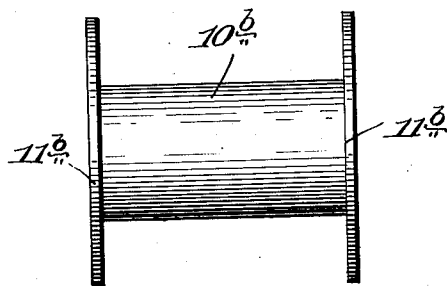


Fig. 8.

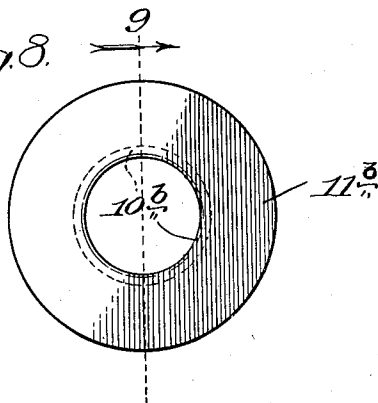
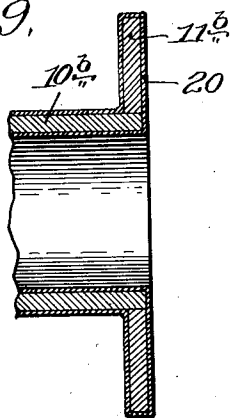


Fig. 9.



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UNITED STATES PATENT OFFICE

2,299,113

COIL FORM AND THE LIKE

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Application December 8, 1939, Serial No. 308,259

4 Claims. (Cl. 242—119)

This invention relates to a coil form and the like. It is particularly useful as a bobbin or spool for coil windings, although it obviously will be applicable to other uses.

An object of the invention is to provide a simple and inexpensive structure and also an expeditious method for forming the same, the structure enabling windings to be supported on a light, sturdy form. A further object is to provide a method and means for supporting windings, the form being made of laminated tape and set in permanent position by simple and inexpensive steps. Other specific objects and advantages will appear as the specification proceeds.

The invention is illustrated in a preferred embodiment, by the accompanying drawings, in which—

Figure 1 is a side view in elevation of a spool embodying my invention; Fig. 2, an end view in elevation; Fig. 3, an enlarged longitudinal sectional view taken on line 3 of Fig. 2; Fig. 4, a side view in elevation of a modified form of the invention; Fig. 5, an end view thereof; Fig. 6, a broken sectional end view of the structure shown in Figs. 4 and 5 taken on line 6 of Fig. 5; Fig. 7, a side view in elevation of a modified form of spool or bobbin embodying my invention; Fig. 8, an end view of the structure shown in Fig. 7; and Fig. 9, a detail sectional view, the section being taken as indicated at line 9 of Fig. 8.

In the illustration given, 10 designates a tubular core, and 11, side flanges secured to the core.

The core 10 is formed by drawing gummed tape about a mandrel so that the adhesive secures one tape winding to the next and provides a laminated tubular body. The tape is preferably provided with water-soluble adhesive which is moistened just prior to the winding operation. Preferably a relatively long tube is formed, and this is subsequently cut into the desired lengths for the coil form.

The flanges 11 may be formed of fiber, Bakelite, or any other suitable material. They are provided with a central opening adapted to receive the core body 10. In the illustration given, the flanges 11 are provided with an inwardly-turned recess adapted to receive the swaged ends of the core.

In the assembly of spools of this type heretofore, rather extensive operations have been followed. I have discovered that the assembly operation can be accomplished briefly and with excellent results by following the steps set out below.

After the short length of core 10 has been formed, I place the flanges 11 in their desired

position, snugly receiving the core and near the ends thereof. The ends of the core are then swaged inwardly to form the upwardly-turned flanges 14. The blow of the metal members striking the edges 14 and directing them upwardly shatters the water-soluble adhesive which is now dry and tends to separate slightly the tape windings at the edge of the structure. To facilitate the swaging operation when a rectangular core is used, I cut the edges so as to form the V-shaped spaces 15, as indicated more clearly in Fig. 2.

After the structure has been formed with flanges 14 struck upwardly and resting within the recess 12 of flanges 11, I immerse the form in a solution of a hardening varnish, lacquer, or condensation product such as phenol formaldehyde solution. Such products are well known and need not be described in detail. The layer of varnish or lacquer 16 forms on the outside of the core 10 and provides a shoulder against the flanges 11 which under normal circumstances will prevent the flanges from moving inwardly. At the same time, the hardening material penetrates the edges of the flanges 14 where the swaging has caused a slight separation of the paper laminations. The hardening lacquer fills these spaces, with the result that the flanges 14 are permanently set in position with the firmness substantially of metal. Further, the tendency of the hardening lacquer to form within the V-shaped recesses 15 prevents the flanges 14 from tending to return to their original position. Thus, by very few and simple steps, a product is formed which is extremely sturdy and which may be formed at exceedingly low cost. As already stated, the swaging of the edges of the laminated core provides the spaces between the paper layers for receiving the hardening lacquer, and further in their outwardly-turned position. Thus, the flowing of the lacquer or resin itself into the spaces provides the permanent lock against outward movement of the flanges 11, while at the same time a thin layer of lacquer on the outer surface of the core between the flanges serves to prevent inward movement of the flanges prior to the coil winding operation, since relatively small stress in this direction is experienced.

In the operation of forming the structures, the tape windings on the mandrel are carried on quickly to form long tubes, which in turn are cut into short lengths. The flanges are slipped on to the core, the ends are swaged, and the form is dipped and then dried in an oven. The product is then complete.

It will be noted that in the foregoing construction, the outer surface of the spool is flush, the recess of the flange receiving the swaged ends of the core. With this structure, the spool or bobbin can be readily inserted within a compartment with a firm bearing against the walls thereof.

In the modified structure shown in Figs. 4, 5 and 6, the core 10^a extends through and beyond the central opening in the flange 11^a. The ends of the core are swaged at 17 and then later covered with the hardening coating 18.

In order to provide a flush outer surface, as well as to protect the corners of the flanges 11^a, I press outwardly portions of the flange 11 to form outwardly extending bosses 19, the outer ends of the bosses lying in a plane substantially even with the coated swaged ends 17. Thus there is provided a smooth outer face for the flanges.

In the structure shown in Figs. 7, 8 and 9, a circular core 10^b is used and the ends thereof are substantially flush with the outer surfaces of the flanges 11^b. The coating 20 of lacquer or varnish, etc., extends evenly along the outer sides of the flanges 11^b and the outer edge portions of the core 10^b. In this structure, the hardening material provides a ring on each side of each flange 11^b to hold it in position. It will be noted that the outer surfaces as well as the inner surface of the flange are flat, thus providing firm anchorage means for the ends of the spool.

While in the foregoing description, I have set forth certain steps in sequence and certain details of structure for the purpose of illustration, it will be understood that considerable variation may be made in them without departing from the spirit of my invention. I wish it to be understood that I do not desire to be limited to the exact details of construction shown and described, for obvious modifications will occur to a person skilled in the art.

I claim:

1. A form for windings and the like, comprising a laminated hollow paper core, flanges carried by said core in spaced relation thereon, at least one of said flanges being at the end of the core and being engaged by a rearwardly-turned end portion thereof, the laminations of said rearwardly-turned end portion being separated, and a hard material within the space between said separated laminations of said end portion of the core and adhering thereto to maintain said end portion in rearwardly turned position.

2. A form for windings and the like, comprising a laminated tubular hollow paper core of substantially uniform cross section throughout its length, flanges carried by the core and frictionally engaging the outer surface of the same at the end portions thereof, the end portions of said core being swaged outwardly and rearwardly and being in engagement with said flanges, the laminations of said swaged end portions being separated, and a hard resinous material within the space between said separated laminations and adhering thereto to maintain said end portions in the swaged position whereby the flanges are locked on the core.

3. A form for windings and the like as set forth in claim 1 wherein the flange at the end of the core is provided with outwardly-struck bosses at spaced points thereon, the outer surface of each of the bosses being substantially near the plane of the end of the rearwardly turned portion of the core.

4. A form for windings and the like as set forth in claim 1 wherein the core is of polygonal cross sectional shape and is equipped with V-shaped recesses at the corners of the rearwardly-turned end portion thereof, said recesses being held in separated position by a hard material received therein and adhering thereto.

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