March 31, 1970 R. F. GILDART 3,503,569

WIRE FRAME REELS

Filed Jan. 12, 1968 2 Sheets-Sheet 1

FIG. 1

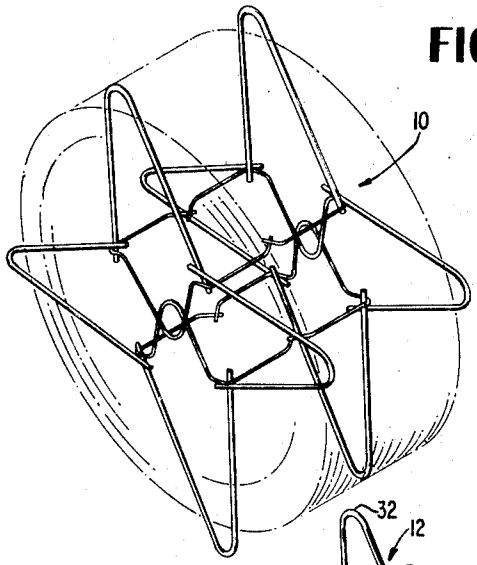



FIG. 2

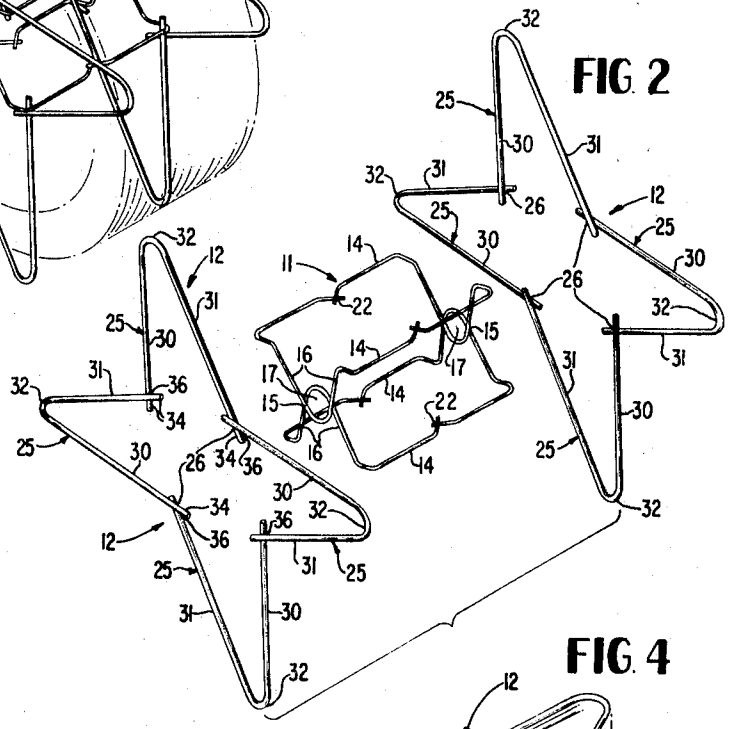



FIG. 7

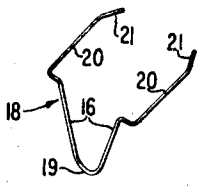



FIG. 3

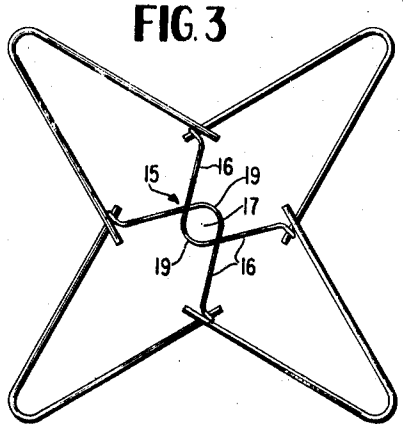
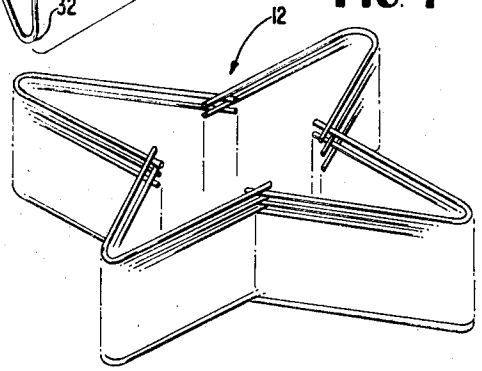



FIG. 4




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WIRE FRAME REELS

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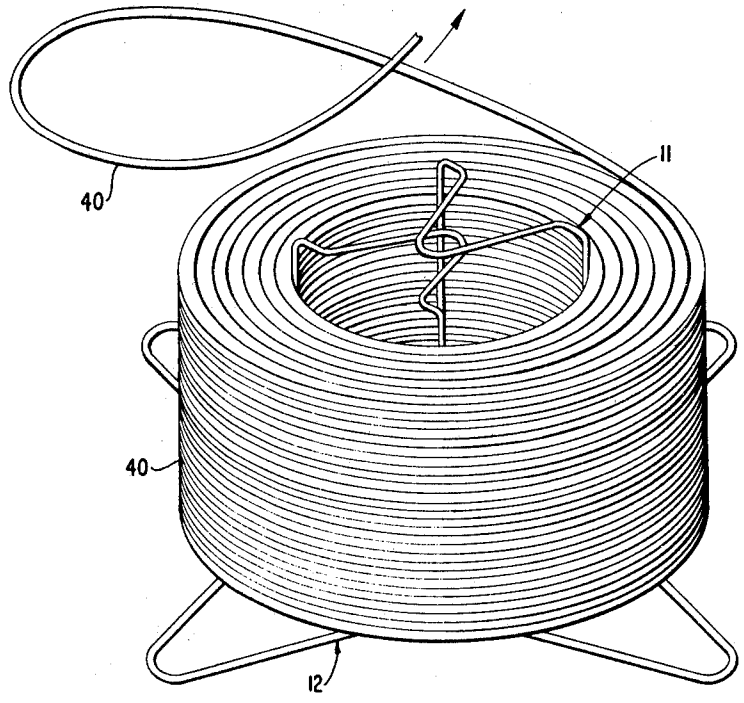



FIG. 5

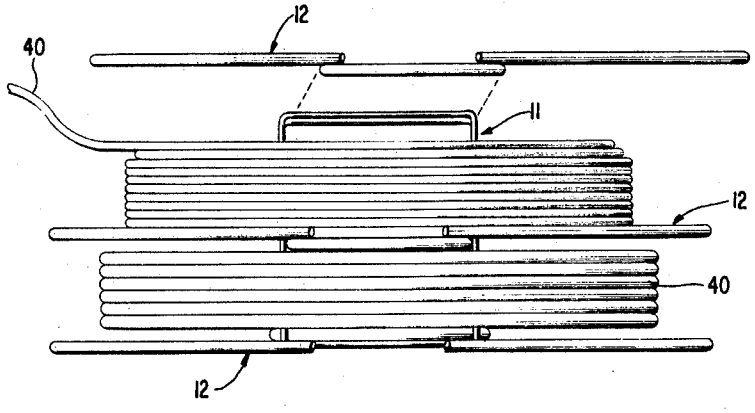



FIG. 6

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# WIRE FRAME REELS

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U.S. Cl. 242—77.2 12 Claims

## ABSTRACT OF THE DISCLOSURE

A collapsible reel including wire frame end flanges which may be manually removed from the reel to permit uncoiling or stranded material wound thereon, and manually reinstalled on the reel without regard to the presence of material wound on the reel.

This invention relates to reels, and particularly to wire frame reels especially useful for handling coils of material such as electrical wire, cable, line, or the like, and which may readily be manually assembled or disassembled without regard to the presence of a coil of wire on the reel.

It is well-known in the prior art to construct a reel for carrying coils of stranded material such as wire, electricians cable, or the like (hereinafter sometimes referred to generally as cable) in the form af a frame constructed from lengths of steel rods or wire shaped into the desired configuration to support the coil. This construction will be referred to generally herein as a wire frame construction, it being understood that the wire, or rods, used in such construction may frequently be relatively heavy and rigid rods or bars. It is also known to construct such wire frame reels in the form of a spool having removable end flange members in the manner illustrated in U.S. Patent No. 1,862,199, the normal purpose of these removable end flanges being to permit the reel to be knocked down when empty so as to occupy less space for storage.

It is also well-known to form stranded material in a coil and package the coil in a container such as a folded paperboard carton, with the material being withdrawn from the inside of the coil through a central opening cut or otherwise formed in the container. This method of packaging is commonly employed for electrical cable of the type used in household or other wiring, in which case the electrican places the coil in a central location and pulls the cable from the central opening in the carton as necessary. However, this results in the wire frequently binding, with the coil being dragged across the floor, and results in substantial wasted effort and time to free the tangled wire within the carton. Accordingly, it is a primary object of this invention to provide an improved wire frame reel for use in storing and handling coiled electrical cable and which will readily admit cable to be uncoiled therefrom over one end of the reel.

Another object is to provide an improved wire frame reel including an end flange which may readily be manually installed and/or removed from the reel without regard to the presence of material wound upon the reel.

Another object is to provide a wire frame reel including flanges which may be manually installed and/or removed from the reel without the use of extraneous fasteners and without regard to the presence of material stored on the reel.

Another object is to provide such a reel in which such flanges may be mounted at various points axially along the length of the reel.

Another object is to provide such a reel in which a plurality of such flanges may be employed to segment the reel to permit a plurality of separate coils of material to be separately stored on the reel.



Another object is to provide such a reel which may be disassembled for storage and shipment, and which may be readily and easily assembled for use.

The foregoing and other objects are attained in a reel including a wire frame spool made up of a plurality of elongated rod members supported at their opposed ends by a wire frame spider or hub member, with the radially outward ends of the hub legs rigidly secured to the ends of the rods of the spool. The end flanges of the reel are of wire frame construction and include a plurality of radially extending spoke members which may be manually deflected to resiliently engage the axial rod members of the spool to support the flanges in position on the reel. The legs of the hub engage the spokes when the flanges are installed on the reel to prevent unintentional removal of the flange. If desired, one or more stops may be provided along the length of the rod members of the spool so that a flange member may be mounted intermediate the ends of the spool to divide the reel into segments, thereby permitting a number of different coils of material to be stored in separate axially spaced areas on the reel.

Other objects and advantages of the invention will become apparent from the following specification, taken with the drawings, in which:

FIG. 1 is a perspective view of a wire frame reel according to the present invention;

FIG. 2 is an exploded view similar to FIG. 1, and showing the various components of the reel;

FIG. 3 is an end elevation view of the reel shown in FIG. 1;

FIG. 4 is a perspective view of a number of flange members shown in stacked relation for storage or shipment;

FIG. 5 is a perspective view showing wire being uncoiled from the reel;

FIG. 6 is an elevational view illustrating the reel employed to store two separate coils of wire; and

FIG. 7 is a perspective view, on an enlarged scale, of an element of the reel structure.

Referring now to the drawings in detail, a reel assembly according to the present invention is illustrated generally by the reference numeral **10**, and includes a wire frame spool **11** and a pair of identical end flanges **12** mounted one on each end of the spool **11**. The spool **11** is a welded wire frame structure comprising four generally parallel longitudinally extending bar members **14** supported in fixed relation to define a core for the reel upon which stranded material may be coiled. The bars **14** are retained in their spaced relation by a pair of spiders, or hubs **15** located one at each end of the reel. The hubs **15** each include four generally radially extending legs **16** each having their radially outer end connected one to the end of each of the bars **14**, and each having their radially inner ends interconnected adjacent the longitudinal axis of the spool. Preferably the legs **16** of each of the hubs **15** are interconnected to form an eyelet or opening **17** along the longitudinal axis of the spool for receiving an axle or a shaft to support the reel for rotation about its longitudinal axis to permit material to be wound thereon or unwound therefrom in the conventional manner.

As best seen in FIGS. 2 and 7, the spool **11** may be fabricated from four identical preformed rod elements **18** each of which includes a pair of legs **16** integrally joined at their radially inner end by an arcuate segment **19** and having integrally formed on their radially outer end a portion **20** of the bars **14**. Preferably the bar segments **20** have their terminal end bent inwardly as at **21**, as will be more fully explained hereinbelow.

The spool is assembled by joining two of the preformed elements **18** together with the arcuate segments **19** in opposed overlaying relation to define the eyelet **17** of one of the hubs. Two of these subassemblies are then

joined by welding together the overlapped portion **21** of the bar segments **20** to form an inwardly directed rigidly welded joint illustrated at **22** in FIG. 2. This joint **22** serves as a positive stop to limit telescoping movement of the flanges **12** axially along the bars **14** as will be more fully explained hereinbelow.

It should be pointed out that, while the spool is constructed of relatively rigid wire or bar stock, it is, nevertheless, sufficiently resilient so that the legs **16** may be manually deflected slightly to facilitate assembly and disassembly of the reel.

The end flanges **12** are illustrated in the drawings as being made up of four elongated rod elements **25** each bent into a substantially V-shaped configuration and rigidly joined at their ends, as at **26**, into a four-pointed substantially star-shaped configuration. The two legs **30, 31** of each of the elongated bars of the flanges **12** extend radially outwardly and are joined at their outer end in fixed relation with respect to one another by an arcuate segment **32**. The separate arcuate segments **32** of the flange define, in effect, the outer periphery of the flange **12**, with the legs, or spokes **30, 31** extending radially inwardly therefrom to engage and support the side face of a coil of material wound upon the reel. As used herein, the terms "radial", or "radially" are intended to refer to relative spacing or direction from a central point, and not as a straight line or ray extending from that central point.

As most clearly illustrated in FIG. 3, the spokes **31** of each V-shaped bar segment **25** are rigidly welded in overlapping relation to the inner end of a spoke **30** on another of the V-shaped elements. The overlapped end portions **34** cooperate with the spokes **30, 31** to define a V-shaped hook **36** at the radially inner end of each of the spokes **30, 31**.

While the steel bar stock or wire employed to form the spokes **30** is relatively heavy, and preferably of larger guage than that employed to form the spool **11**, the spokes are, nevertheless, capable of limited resiliently resisted deflection by the application of manual pressure. Thus, by positioning one of the hooks **36** over a bar **14** adjacent the arm **16** and applying manual pressure between the spokes of the flange and successive arms around the hub, the arms and the spokes may be deflected in the plane of the flange sufficiently to permit successive hooks **36** to be positioned over the bars **14** to install a flange on the spool. The overhanging portion **34** of the spokes will then engage the arms **16** to prevent the flange from sliding axially off the spool. By installing a second flange **12** on the spool **11**, in the manner just described, the assembled reel illustrated in FIG. 1 is completed.

Referring to FIGS. 1 and 6, it is believed apparent that one of the flanges **12** may be slid axially inward from the end of the spool until the end portions **34** engage the stops **22** to position the flange adjacent the center of the spool. A third flange could then be installed on the end of the spool to complete the reel having two axially spaced segments for supporting separate coils of material.

Referring now to FIGS. 5 and 6, a coil of material such as the cable commonly employed in electrical wiring systems may be placed upon the reel, either by winding the cable directly on the reel or by removing one of the end flanges **12** and telescoping a separately formed coil onto the spool **11**, and subsequently reinstalling the end flange. The cable **40** may then be unwound from the reel by inserting an axle or mandrel through the eyelets **17** of the reel and permitting the reel to rotate thereon to unwind the cable. Alternatively, the reel may be positioned on its end (one of the flanges **12**) and the upper flange manually removed. The cable may then be pulled off the end of the reel, unwinding the cable from the outside of the coil as it is pulled over the end of the flange. Thus, an electrician may follow the conventional practice of positioning a coil of cable centrally within a room where he is working, and removing lengths of wire as desired merely by pulling the wire upwardly off the end



of the reel. Upon completion of the job, or movement to another location, the end flange may be quickly and easily manually replaced upon the end of the spool to facilitate transportation of the cable. Any excess cable which has been removed can quickly and easily be rewound on the reel.

The embodiment of the invention illustrated in FIG. 6 may be particularly useful in instances where it is frequently desired to use two different sizes or types of stranded material. In this embodiment, it is only necessary to remove the proper flange to permit removal of the size cable desired. It is believed apparent that the reel could readily be adapted to provide three separate storage areas, in which case the cable coiled on the center area would be removed as in a conventional reel.

While I have disclosed and described a preferred embodiment of my invention, I wish it understood that I do not intend to be restricted solely thereto, but that I do intend to include all embodiments thereof which would be apparent to one skilled in the art and which come within the spirit and scope of my invention.

I claim:

**1.** In a collapsible wire frame reel including a spool and a pair of flanges mounted one on each end of said spool, the improvement wherein said flanges each comprise a wire frame having means defining an opening therein for telescopingly receiving the end of said spool, retaining means on said spool, and mounting means on said flange for engaging said retaining means to releasably retain said flange on said spool, said retaining means and said mounting means being supported for limited resiliently resisted deflection in a plane substantially perpendicular to the longitudinal axis of said spool to permit said flanges to be installed and removed from said spool without regard to the presence of material wound on said reel.

**2.** In a collapsible wire frame reel as defined in claim **1**, the further improvement wherein flanges comprise a plurality of radially extending spoke members, said mounting means being supported on the radially inner ends of said spoke members in position to resiliently engage said retaining means on said spool to releasably retain said flanges thereon.

**3.** A wire frame reel as defined in claim **2** wherein said radially inner ends of said spoke members are supported for limited resiliently resisted deflection within the plane of said flanges to permit engagement and disengagement of said mounting means with said retaining means.

**4.** A wire frame reel as defined in claim **3** wherein said spool comprises a core defined by a plurality of elongated rod members supported at each end in spaced generally parallel axially extending relation by a hub including a plurality of radially extending legs, said legs each having one end connected one to each of said rod members, said legs and rod members cooperating to define said retaining means.

**5.** A collapsible reel comprising a wire frame spool including a core defined by a plurality of elongated rod members supported at least at one end in spaced generally parallel axially extending relation, by a hub including a plurality of radially extending legs, said legs each having one end rigidly connected one to each of said rod members, and a pair of flange members mounted one on opposite ends of said spool for retaining a coil of stranded material thereon, at least one of said flanges being removable, said at least one removable flange being of wire frame construction and including a plurality of radially extending spoke members, said at least one flange having a central opening therethrough of sufficient size to telescopingly receive said core, means connecting the radially outer ends of said spoke members in substantially fixed relation to one another, and hook means on said spokes in position to engage said rod members when said core is telescopingly received in said central opening to releasably retain said at least one flange on said spool, said spokes being dimensioned for limited resiliently resisted deflec-

tion relative to one another to permit said hook means to be engaged and disengaged from said rod members whereby said at least one flange may be manually installed and removed from said spool without regard to the presence of material coiled on said reel.

**6.** The collapsible reel defined in claim **5** wherein said legs are dimensioned for limited resiliently resisted deflection in a plane generally perpendicular to the longitudinal axis of said spool to facilitate installation and removal of said at least one flange.

**7.** The collapsible reel defined in claim **6** wherein each of said flanges are removable.

**8.** A collapsible reel comprising a wire frame spool including a core defined by a plurality of elongated rod members supported at least one end in spaced generally parallel axially extending relation, by a hub including a plurality of radially extending legs, said legs each having one end rigidly connected one to each of said rod members and being dimensioned for limited resiliently resisted deflection in a plane generally perpendicular to the longitudinal axis of said spool, and a pair of removable flange members mounted one on opposite ends of said spool for retaining a coil of stranded material thereon, said removable flanges being of wire frame construction and including a plurality of radially extending spoke members, means connecting the radially outer ends of said spoke members in substantially fixed relation to one another, hook means on said spokes in position to engage said rod members to releasably retain said at least one flange on said spool, a third removable flange mounted on said rod members in spaced relation to said pair of removable flanges, and stop means on at least selected ones of said rod members intermediate the ends thereof in position to engage the hook means on said third removable flange to limit movement thereof axially along said rod members, said spokes being dimensioned for limited resiliently resisted deflection relative to one another to permit said at least one flange to be manually installed and removed from said spool without regard to the presence of material coiled on said reel.



**9.** The collapsible reel defined in claim **8** wherein said flanges each comprise a plurality of rod members formed into a generally U-shaped configuration, said rod members having their free ends interconnected by welding to form a closed generally star-shaped loop having a plurality of radially outwardly extending arms each defined by a pair of spokes joined at their outer end, said hook means on said spokes projecting into said closed loop in position to engage said rod members when said flanges are installed on said spool.

**10.** The collapsible reel defined in claim **5** wherein the other end of said legs of said hubs are interconnected to define a pair of eyelets one at each end of said reel for receiving an axle to support the reel for rotation about its longitudinal axis.

**11.** The collapsible reel defined in claim **5** wherein said hooks slidably engage said rod members when said removable flanges are installed on said spool to permit said removable flanges to be slidably moved axially along said spool to position said removable flange in spaced relation to the end of said spool whereby the effective length of said reel may be varied, said legs being positioned to engage said hook means to prevent said removable flanges from being inadvertently slid off the end of said spool.

**12.** The collapsible reel defined in claim **11** further including stop means on at least selected ones of said rod members intermediate the ends thereof, said stop means being positioned to engage said hook means to limit the sliding movement of said removable flange.

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GEORGE F. MAUTZ, Primary Examiner

U.S. Cl. X.R.

242—115, 129