May 26, 1964 L. COHEN 3,134,557

METAL SPOOL

Filed Sept. 16, 1960 2 Sheets-Sheet 1

Fig. 1

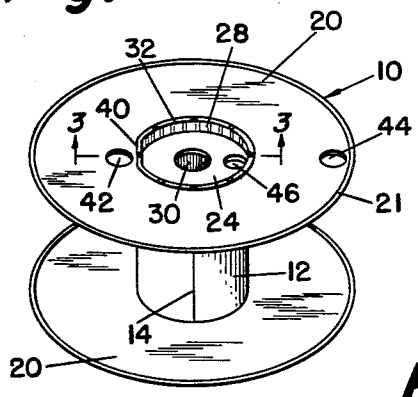


Fig. 2

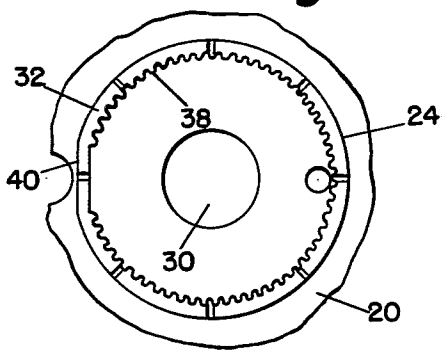


Fig. 3

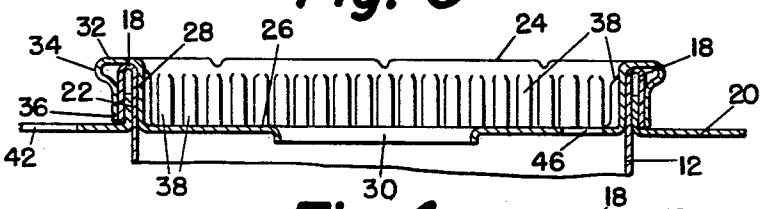


Fig. 4

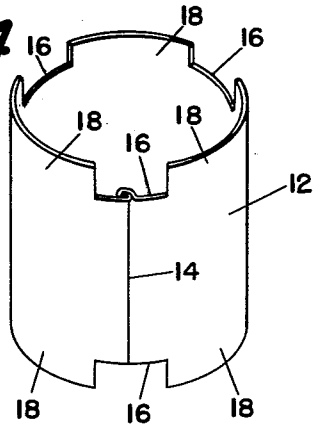


Fig. 5

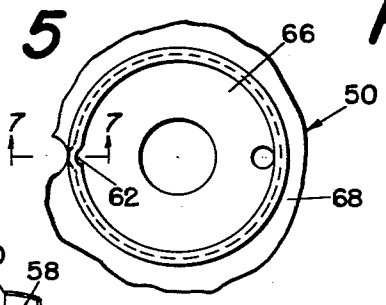


Fig. 6

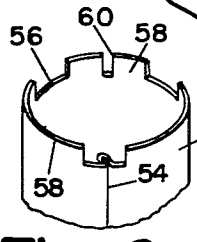


Fig. 7

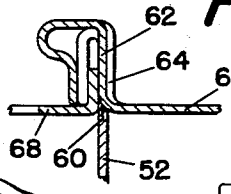


Fig. 9

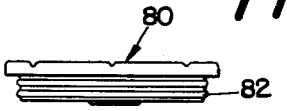
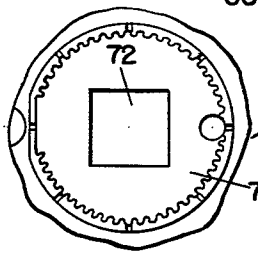


Fig. 8



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METAL SPOOL

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Fig. 10

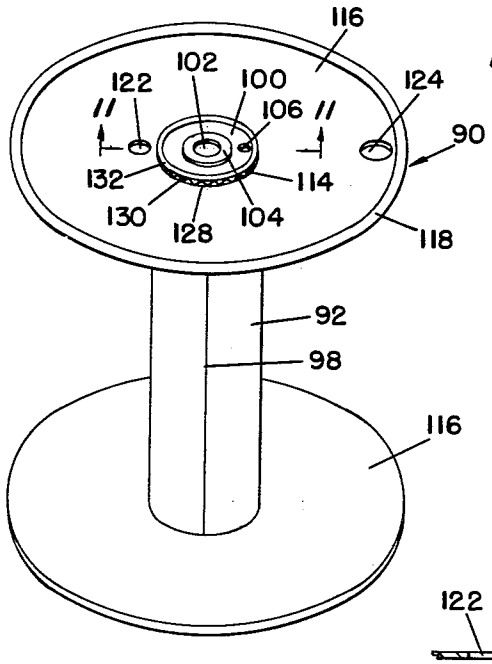


Fig. 11

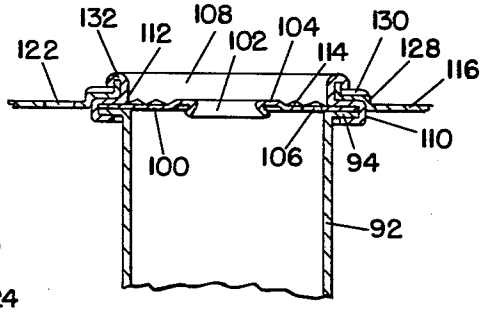
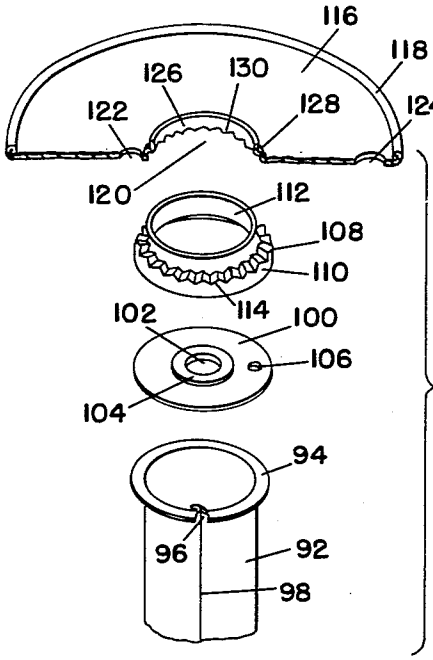


Fig. 12



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United States Patent Office

3,134,557
Patented May 26, 1964

3,134,557

METAL SPOOL

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Filed Sept. 16, 1960, Ser. No. 56,402
8 Claims. (Cl. 242—118.61)

This invention relates to spools for holding coils of wire or cable, and it particularly relates to spools of this type which are constructed of separate parts which are pre-formed and then connected together.

Spools of the aforesaid type are provided with the coils of wire or cable by inserting the spool on an arbor or mandrel and then rotating the spool while its core is in contact with a longitudinally movable strip of the wire or cable, the drive connection being through one of the flanges of the spool.

There are various types of separable spool constructions now in use. One such construction comprises a tubular core which is connected to a disc-like flange at each end by bending each end of the core around the periphery of a central aperture in the corresponding flange and applying a central cover plate or cap into each central aperture in overlying relation to the bent over edge of the core. The cap is provided with a central aperture to permit insertion of the arbor or mandrel. The cap acts as a protective cover for the raw edges of the bent-over portions of the core and also serves to provide a finished look to the spool.

Although the above-described spool is generally effective for its purpose, it is subject to several disadvantages. One such disadvantage is the relative movement or slippage between the core and the flanges if the bent over edges become the least bit loose on the flanges. Since the driving connection is to a flange, when such slippage occurs, the core does not rotate and the strip of wire or cable is not wound on the spool.

Another disadvantage of the above-described spool is the high cost incident to the use of separately machined caps and to the necessity of having labor with sufficient skill and experience to properly assemble the parts without undue buckling and crinkling of the edges of the core.

It is one object of the present invention to overcome the above and other disadvantages of the prior spools of this type by providing a separable spool construction wherein there is no slippage between the core and the flanges under conditions of use.

Another object of the present invention is to substantially decrease the cost of labor and material while maintaining a high quality of product.

Another object of the present invention is to provide a spool of the aforesaid type which is relatively simple in construction and easy to manufacture.

Other objects and many of the attendant advantages of this invention will be readily appreciated as the same becomes better understood by reference to the following detailed description when considered in connection with the accompanying drawings wherein:

FIG. 1 is a top perspective view of a spool embodying the present invention;

FIG. 2 is an enlarged, fragmentary top plan view of the spool of FIG. 1;

FIG. 3 is a further enlarged, fragmentary sectional view taken on line 3—3 of FIG. 1;

FIG. 4 is a perspective view of the core portion of the spool of FIG. 1;

FIG. 5 is a fragmentary top plan view of a second embodiment of the invention;

FIG. 6 is a fragmentary perspective view of the core utilized in the form of the invention shown in FIG. 5;

FIG. 7 is an enlarged, fragmentary, detailed sectional view taken on line 7—7 of FIG. 5;

FIG. 8 is a view similar to FIGS. 2 and 5 but showing a further modified form of the invention;

FIG. 9 is a side elevational view of a still further modified form of the invention;

FIG. 10 is a perspective view of yet another embodiment of the present invention;

FIG. 11 is an enlarged, fragmentary sectional view taken on line 11—11 of FIG. 10; and

FIG. 12 is an exploded view of the spool of FIG. 10.

Referring now in greater detail to the various figures of the drawing wherein similar reference characters refer to similar parts, there is shown a spool, generally designated **10**, comprising a core **12** formed from a single sheet or strip of metal bent into cylindrical or tubular shape. The ends of the metal strip are held together by the seam **14**.

At each end of the tubular core **12**, the peripheral edge is slotted at spaced intervals, as at **16**, to form peripherally spaced tabs **18**. The seam **14** extends longitudinally of the core between opposed slots **16**.

At each end of the core **12** is connected a disc-like flange **20**. Each flange **20** is provided with a rolled outer rim **21** and with a central aperture coaxial with the hollow core and of slightly larger diameter so that the core may fit snugly therein. The aperture is defined by an upstanding peripheral wall or rim **22**.

When the ends of the core are inserted through the central apertures of their respective flanges, the tabs **18** are bent around the peripheral wall **22** and are retained in this position by a cover or cap **24**. The fact that spaces **16** are provided between the tabs prevents any buckling or crinkling of the bent portions.

The cap **24** comprises a centrally recessed bottom wall **26** defined by an upstanding peripheral wall **28**. The recessed bottom wall **26** is provided with a central aperture **30** and the peripheral wall **28** is provided with a radially outwardly extending flange **32** which is bent to form a lateral bead **34** from which depends a portion **36** frictionally engaged with the tabs **18**.

In order to maintain a positive engagement between the parts at all times, the peripheral wall **28** of the cap **24** is provided with vertical ribs or corrugations **38** which positively grip the inner surface of the tabs **18** and hold them securely clamped against the peripheral wall **22**. The cap is also provided with a flat **40** which acts like a key to prevent relative rotational movement between the cap and the flange. In this manner, all the component parts are held in fixed relation to each other.

The flanges **20** are each provided with a hole **42** to accommodate the drive finger of the machine for rotating the spool and a hole **44** to receive the outer end of the wound wire or cable, the inner end being attached to a hole **46** in the cap **24**.

In FIGS. 5, 6 and 7 there is shown an alternate form of the device wherein the spool **50** is similar to spool **10** in that it comprises a tubular core **52** having a longitudinal

seam 54 and slots 56 at each end to define tabs 58. However, one of the tabs 58 is provided with a slot 60 for receiving a rib 62 on the peripheral wall 64 of the cap 66 mounted on flange 68. The rib 62 provides a toothed means which serves both to retain the core against movement relative to the flange 68 and to retain the cap 66 against movement relative to the flange. A plurality of ribs and slots may be used where desired. In other respects, the spool 50 is identical to spool 10.

In FIG. 8 there is shown a spool 70 which is identical to spool 10 except that the central aperture 72 of the cap 74 is of square cross-section rather than round. This permits the use of similarly shaped drive shaft which is, in effect, keyed to the spool. This arrangement eliminates the necessity for a drive hole such as shown at 42. This is advantageous because it often happens that the drive finger acts to tear or distort the drive hole 42, thereby damaging the spool and interfering with the efficient operation of the machine.

In FIG. 9 there is shown a modified form of cap wherein the cap 80 is identical to cap 24 except that instead of utilizing vertical ribs or corrugations, such as shown at 38, the cap 80 is provided with horizontal or circumferential corrugations 82 on its central depressed portion.

In FIGS. 10, 11 and 12 there is illustrated a preferred embodiment of the invention which comprises a spool, generally designated 90. This spool 90 comprises a tubular core 92 having open ends, each end being defined by a peripheral, outwardly extending radial flange 94. The flange 94 is interrupted at 96 to permit the longitudinal seam 98 to be properly made.

Adapted to be mounted at each end of the core 92 is a cap assembly which includes a disc 100 centrally apertured at 102 with this central aperture being defined by an upstanding rib 104. The disc 100 seats on its corresponding flange 94 and is provided with a driving hole 106 just inwardly of its seat on the flange.

With the disc in position on the flange 94, a cap 108 is applied thereover. This cap 108 is of generally annular configuration with a rim 110 integral with an axially extending peripheral flange 112. The upper surface of the rim 110 is provided with an annular series of corrugations or teeth 114.

The spool 90 is provided with disc-like flanges 116 somewhat similar to the flanges 20 in that they are each provided with a rolled outer rim 118 and a central aperture 120. Holes 122 and 124, similar to corresponding holes 42 and 44, are also provided. However, contrary to flanges 20, in the flanges 116, the central aperture 120 is defined by a peripherally upstanding wall flange 126 extending from a raised annular rib 128. The rib 128 is corrugated or toothed, as at 130.

In assembling the spool 90, each end of the core 92 is first provided with a cap assembly. This is accomplished by holding the core upright with one end on top, then placing the corresponding disc 100 on the end of the core so that the disc rests of the flange 94. Then the cap 108 is applied by forcing the rim 110 over the flanges 94 and then bending the rim 110 around the flange 94 (as best shown in FIG. 11). In this position, the corrugations 114 help to hold the cap 108 in tight engagement with the disc 100 and flange 94 of the core. Corrugations 114 perform this function since the lower edges thereof will be forced into the top surface of disc 100. The lower surface of disc 100 will, in turn, be slightly deformed, thereby more tightly engaging the flanges 94 (FIG. 11). The opposite end of the core is then treated in the same manner.

With the cap assemblies applied to both ends of the core 92, the flanges 116 are connected thereto by inserting the flange 112 of each cap 108 through the aperture 120 of the corresponding flange 116 and then bending the flange 112 over the corresponding flange 126 to form a

locking bead 132. In this position, the corrugations 114 are interengaged with the corrugations 130 so that the parts are securely locked against relative slippage.

Obviously many modifications and variations of the present invention are possible in the light of the above teachings. It is, therefore, to be understood that within the scope of the appended claims, the invention may be practiced otherwise than as specifically described.

What is claimed as the invention is:

1. A spool comprising a tubular core having open ends, circumferentially spaced tabs on the edge of each of said ends, a disc-shaped flange connected to each end of said core, each of said flanges being provided with a central aperture defined by an upstanding peripheral rim, the end portions of said core extending through the central aperture of the corresponding flanges and the tabs thereof being bent around said rim and in frictional engagement therewith, a cap overlying the central aperture of each flange, said cap having a centrally apertured depressed portion defined by a peripheral wall and fitting within the corresponding end portion of the core, said cap having a radially outwardly extending flange overlying the corresponding bent tabs and in frictional engagement therewith, and rib means on the peripheral wall of said depressed portion in frictional engagement with the inner peripheral surface of said core to hold said core, cap and flange in locked, non-slippable engagement.

2. The spool of claim 1 wherein said rib means comprises a series of axially extending corrugations.

3. The spool of claim 1 wherein said rib means comprises an axially extending rib, said rib being frictionally engaged with walls defining a corresponding slot on one of the tabs of the core.

4. The spool of claim 1 wherein said ribs means comprises a series of circumferentially extending corrugations.

5. The spool of claim 1 wherein said cap is provided with a flat on its periphery, said flat serving to prevent relative rotation between said cap and said flange.

6. The spool of claim 1 wherein the central aperture in said depressed portion is substantially rectangular.

7. A spool comprising a tubular core having open ends, a cap assembly at each end of said core, said cap assembly including a centrally apertured disc portion covering the corresponding end of the core, said disc portion having a peripheral flange portion, a spool flange at each end of said core, each spool flange having a central opening defined by an integral upstanding circumferential wall and encompassing the disc portion of its corresponding cap assembly, the flange portion of each cap assembly being bent over and around the circumferential wall of its corresponding spool flange to form a protective circumferential bead, and toothed means formed on said cap assemblies and said spool flanges, said toothed means being permanently interlocked, whereby relative rotational movement between said cap assemblies and said spool flanges is prevented, said cap assemblies comprising a radial rim having corrugations on its upper surface, each of said spool flanges being provided with an annular rib surrounding its upstanding circumferential wall, said rib being corrugated, and the corrugations of said radial rim and of said rib being in interlocking engagement with each other to provide said toothed means.

8. A spool comprising a tubular core having open ends, said core being provided with an outwardly extending radial flange at each end, a cap assembly at each end of said core, said cap assembly including a centrally apertured separable disc positioned at each end of said core, each of said discs resting on the corresponding radial flange, a cap comprising an annular rim portion integral with an axially extending annular flange portion, said rim portion being corrugated, said disc and cap each comprising said cap assembly at the corresponding end of

the core, a spool flange at each end of said core, each spool flange having a central opening defined by an upstanding circumferential wall and encompassing the cap of its corresponding cap assembly, the circumferential wall of each spool flange being surrounded by an annular corrugated rib, the corrugated rim portion of each cap being in interlocked engagement with the corrugated rib of the respective spool flange to provide permanently interlocked toothed means, whereby relative rotational movement between said cap assemblies and said spool flanges is prevented, and the axially extending annular flange portion of each cap being bent over the circumferential wall of the respective spool flange to form a protective circumferential bead.

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