United States Patent

Lit et al.

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[54] **ROTATABLE DISPENSER FOR PRECUT LENGTHS OF WIRE**

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[73] Assignee: **General Electric Company**

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[52] **U.S. Cl.** **211/70**, 211/164, 242/55.2, 312/73

[51] **Int. Cl.**.....**A47f 7/00**, A47f 13/04

[58] **Field of Search**.....211/70, 49 D, 49 S, 164, 163, 211/60, 13, 61, 67, 89; 221/34, 307; 312/73, 97, 72, 86, 97.1

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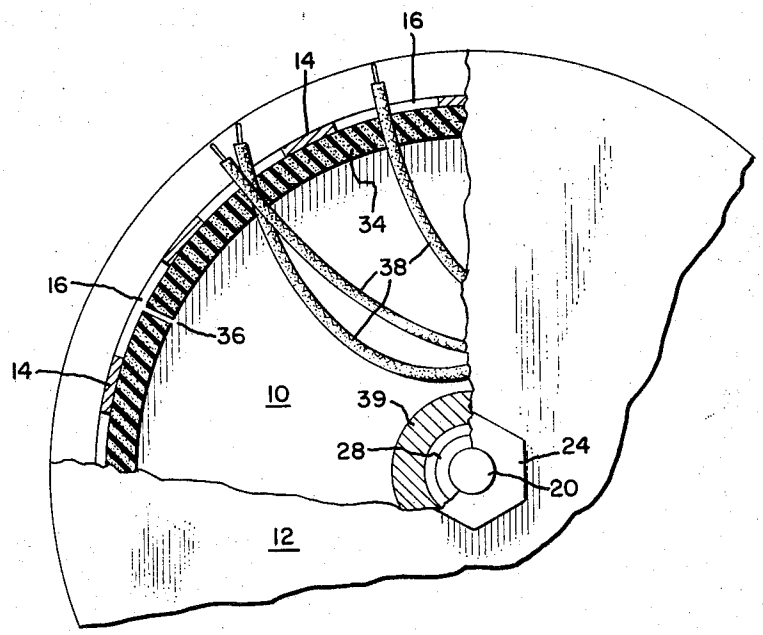
[57] **ABSTRACT**

A rotatable dispenser for lengths of wire used in the manufacture of electronic or electrical equipment. The dispenser includes a holder comprising a pair of discs spaced apart by a perpendicular circumferential wall preferably either integral with or permanently secured to one of the discs. When the other of the discs is set aside, precut lengths of wire may be loaded in bundles into the cavity defined by the first disc and the circumferential wall. Each bundle is loaded with one end of each of its wires protruding through a dispensing opening formed in the circumferential wall. With the second disc in place, the holder is rotatably mounted on a work bench mount or a floor mount adjacent a work bench. Each dispensing opening in the circumferential wall would preferably be labeled with the type and length of wire so that a worker could easily select each individual wire as he needs it.

5 Claims, 4 Drawing Figures



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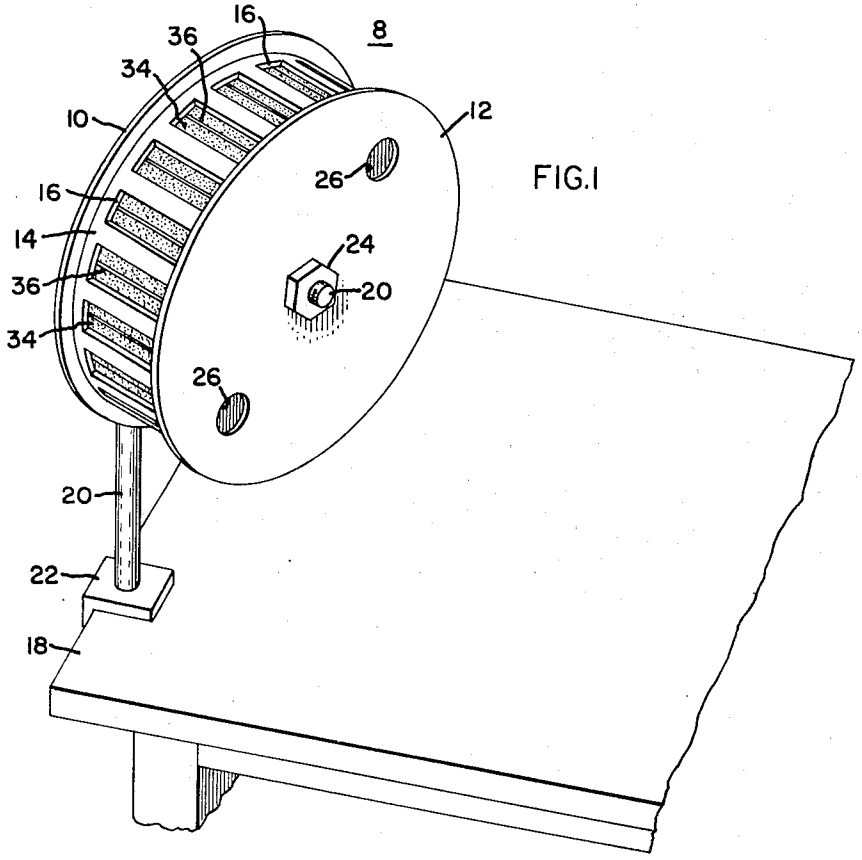

FIG.1

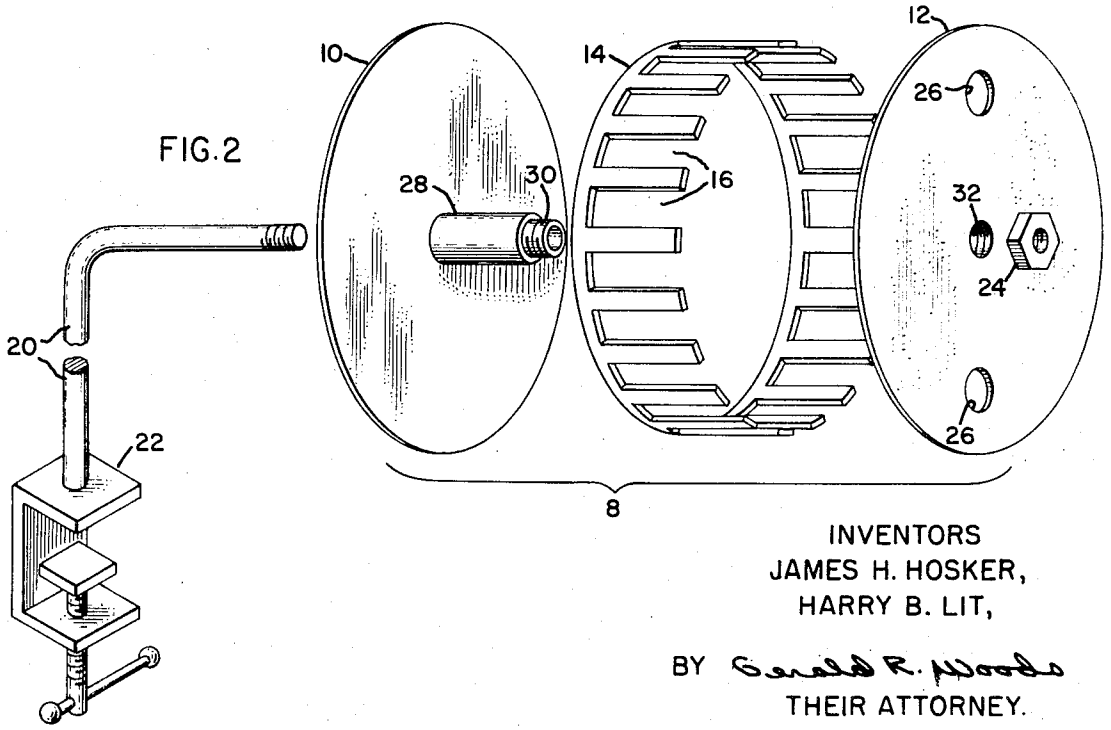

FIG.2

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FIG.3

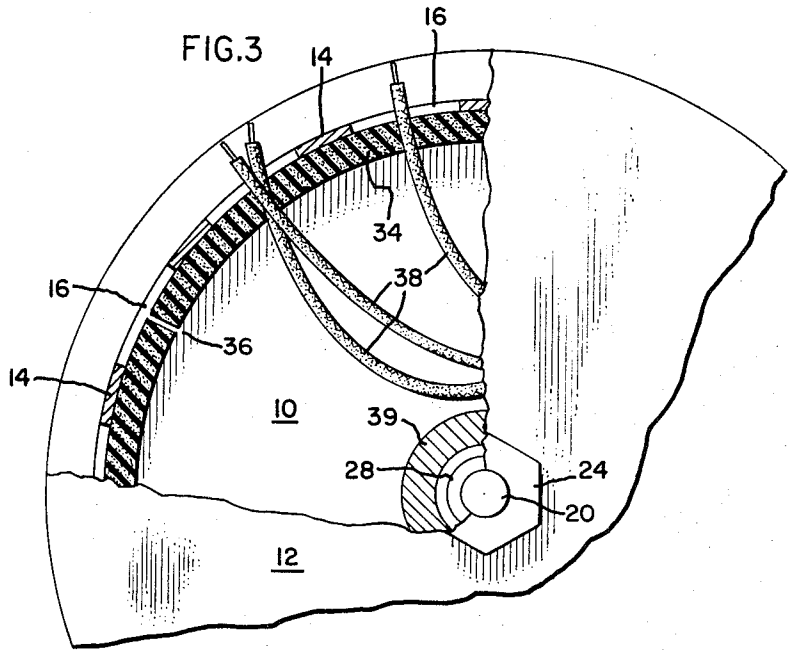
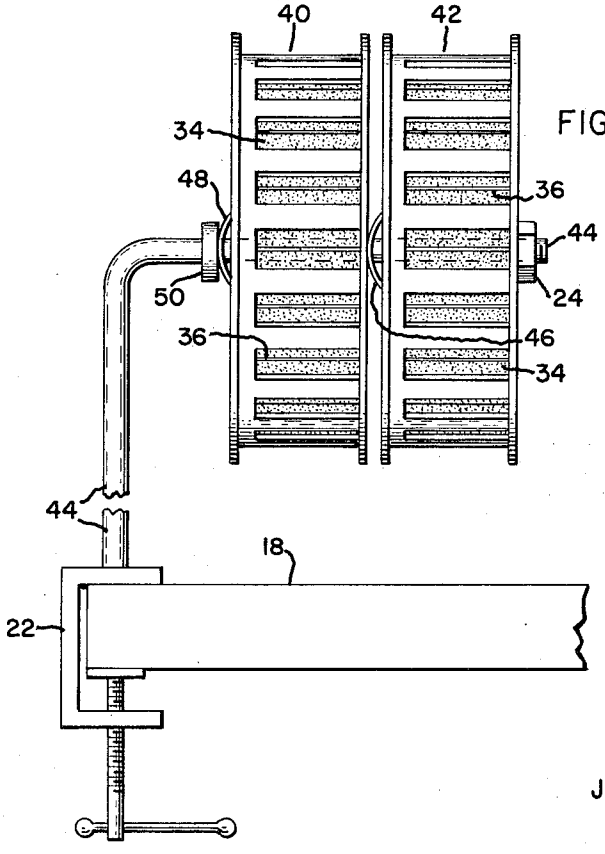


FIG.4



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ROTATABLE DISPENSER FOR PRECUT LENGTHS OF WIRE

BACKGROUND OF THE INVENTION

The present invention relates to dispensers and more particularly to a rotatable dispenser for storing precut lengths of wire for use in the manufacture of electronic or electrical equipment.

In manufacturing electronic or electrical equipment, it is an established industry practice to cut and strip lengths of wire at a central cut station. The wires are then bundled and carted to assembly stations where the wires are installed either directly in the equipment being manufactured or in wire harnesses, bundles of wire leads which are installed as units in the equipment being manufactured. Since the precut lengths of wire are brought in bundles to the assembly station but are installed individually, a dispenser must be provided for storing the wires at the station prior to their use.

A suitable dispenser may be defined as one which stores the numbers and types of wires needed for a particular assembly operation, and which permits a worker to easily reach all wires in the dispenser and to easily distinguish one type of wire from another. A suitable dispenser may be further defined as one which requires a minimum amount of space at an assembly station, which protects the ends of wires from damage and which minimizes tangling of wires when an individual wire is withdrawn.

There are several different types of dispensers in use. Among the simplest of these are the type in which wires are merely draped across pegs or longer rods. While this type is inexpensive and easy to fabricate, it has several drawbacks. Wires draped near the end of a long rod or on lower pegs are more difficult for a worker to reach. When an attempt is made to extract a single wire from this type of dispenser, other wires are sometimes dragged from their place on the dispenser which can result in a jumbled pile of wires at the foot of the dispenser unless the worker takes the time and trouble to replace each inadvertently removed wire. A further disadvantage of this type of dispenser is that it cannot be used for short wires and does not protect the wires from dust or damage. Another type of dispenser in use consists of parallel troughs into which different kinds of wires may be loaded. One of the major disadvantages of this type of dispenser is that not all troughs can be positioned within easy reach of a worker. Except for a few of the nearest troughs, a worker has to feel blindly for the wires he wishes to extract. Due to their simplicity, dispensers made of troughs, pegs or rods are generally "homemade" devices fabricated by the manufacturer of the electrical or electronic equipment.

More sophisticated dispensers are available. Among these are dispensers in which wires are stored in vertical tubes grouped somewhat like the pipes in a pipe organ and having dispensing openings near the bottom of each tube. The maximum length of wires that may be stored in the tubes is generally limited by the length of the individual storage tubes while the minimum length is limited by the fact that shorter wires tend to fall out of the tubes.

Another type of commercially available dispenser is a wire-formed rectangular rack with dispenser slots on one side. Rectangular racks are bulky, taking up as much as 25 percent of the available work surface area on a typical workbench, and do not allow an operator to reach all stored wires with equal ease.

Each of the dispensers mentioned above has an additional significant disadvantage. The capacity of each is limited both in the number of different types and and in the total number of wires which can be stored. Because of the complexity of electrical or electronic equipment being manufactured today, the required wires and types of wires often exceed the capacities of the prior art dispensers described. The capacity of some types of the prior art dispensers may, of course, be increased by grouping several units. However, the groupings require a considerable amount of assembly station space and often must be located at least partly beyond an operator's convenient reaching distance.

SUMMARY

The present invention is a rotatable dispenser for precut lengths of wire or other elongated materials which has a large capacity for different kinds of material, requires a minimum amount of assembly station space, provides equal access to all stored lengths, permits extraction of a single length of material without tangling, and provides protection for lengths of material. Dispensers constructed in accordance with the present invention are inexpensive and easily grouped to provide different dispensing arrangements which meet the requirements of different types of assembly operations.

A rotatable dispenser constructed in accordance with the present invention includes a canister-type holder with one or more openings in a circumferential wall. Precut lengths of material are loaded into the holder with one end of each length protruding through an opening in the circumferential wall. The holder is rotatably mounted on a suitable support at an assembly station.

BRIEF DESCRIPTION OF THE DRAWINGS

While the specification concludes with claims particularly pointing out and distinctly claiming that which is regarded as the present invention, certain details of preferred embodiments of the invention may be more readily ascertained from the following detailed description when read in conjunction with the accompanying drawings in which:

FIG. **1** is a perspective view of an assembled dispenser mounted at an assembly station workbench;

FIG. **2** is an exploded perspective view showing the basic components of the dispenser of FIG. **1**;

FIG. **3** is a partially cutaway elevation of one sector of a dispenser showing certain internal components not depicted in FIGS. **1** or **2**; and

FIG. **4** is an edge view of a pair of holders mounted on a single support to provide increased wire dispensing capacity.

DETAILED DESCRIPTION

Referring now to FIG. **1**, a dispenser constructed in accordance with the present invention includes a canister-type holder **8** which may have first and second discs **10** and **12** spaced from one another by an intermediate circumferential wall **14** having a plurality of openings, such as opening **16**, providing access to the

cavity defined by discs **10** and **12** and circumferential wall **14**. In a preferred embodiment of the invention, the diameters of the discs **10** and **12** are greater than the diameter of the circumferential wall **14**, providing wire-protecting flanges. Also in a preferred embodiment, the circumferential wall **14** is either integral with or permanently attached to one of the discs while the other of the discs is removable. For purposes of illustration, it will be assumed that the circumferential wall **14** is attached permanently to disc **10**.

With disc **12** removed, bundles of precut lengths of wire are loaded into the cavity defined by disc **10** and circumferential wall **14** with one end of each wire protruding through one of the circumferential openings **16**. Loaded wires are held in place in the chamber by securing the second disc **12** to the first disc **10** by means of an internal threaded arrangement to be described later in connection with FIG. **2**. The assembled holder **8** may be mounted in any number of ways, either on a workbench **18** or beside the workbench on a suitable floor mount. For purposes of illustration, the holder **8** is shown as being rotatably supported on an inverted L-shaped rod **20** removably clamped to one edge of the workbench **18** by a "C" clamp **22**. The horizontal leg of rod **20** extends through aligned holes in the discs **10** and **12**. A conventional nut **24** threaded onto the threaded end of rod **20** completes the support assembly. The diameter of the rod **20** is less than the inner diameter of the aligned holes through discs **10** and **12** so that the holder **8** can rotate about the axis of rod **20**. Finger holes **26** or equivalent knobs can be provided in one or both of the discs **10** and **12**, making it easier to rotate the dispenser to bring any wire in the holder within reach of an operator.

Basic components of the assembled dispenser shown in FIG. **1** appear in the exploded perspective view of FIG. **2**. Many of the components described with reference to FIG. **1** appear again in FIG. **2** and in subsequent FIGS. **3** and **4**. Where the same component appears in different figures, the same numeral is used to identify that component in each of the figures.

In a preferred embodiment of the invention, the holder **8** consisting basically of discs **10** and **12** and circumferential wall **14** can be assembled as a unit independently of the type of support assembly that is to be used. To this end, a hollow hub **28** is attached to the inner face of disc **10** at the center of the disc. The hub **28** includes an externally threaded segment **30** at its outer end. The disc **12** includes an internally threaded element **32** at its center. While the material forming disc **12** could itself be tapped to provide the internal threads, it is preferred to permanently secure a nut to the inside face of disc **12** to provide the internally threaded element **32**. When the internally threaded element **32** is threaded onto the threaded length **30** of hub **28**, the discs **10** and **12** and the circumferential wall **14** form an assembled holder. Since the holder can be assembled as a complete unit independent of its support, the same holder can be used with different types of supports to form different dispensing arrangements. Also, the holder can be taken as a unit to a central cut station at which precut lengths of wire are automatically cut and stripped. When the holder itself is loaded at the central cut station, there is no longer any need for special carts normally used to transport bundled, precut lengths of wire from the cut station to the assembly stations.

FIG. **2** is intended to illustrate only the basic components of a dispenser constructed in accordance with the present invention and does not show certain of the components which greatly facilitate use of the dispenser when certain types of wires are to be dispensed. Additional components are shown in the fragmentary sectional view of FIG. **3**. The internal face of the circumferential wall **14** is normally lined with a layer **34** of resilient material such as foam rubber or polyurethane foam which includes slots **36** aligned with each of the openings **16** in the circumferential wall **14**. The protruding ends of loaded wires, represented by wires **38**, are forced into the slots **36**. The resiliency of layer **34** restricts the movement of wires in the holder **8** to permit the extraction of a single wire at a time. The layer **34** also tends to hold the protruding ends of the wires in place as the holder **8** is rotated so that the protruding wires, regardless of how short they may be, do not fall either out of or into the cavity.

Where extremely long wires are to be dispensed, the inner ends of the wires sometimes become wrapped about the hub of the holder. To minimize the frictional drag on an extremely long wire, a bearing **39** shown only in partial cross section, is mounted on the hub **28**. Also, thin internal discs or spacers (not shown) may be mounted on the hub **28** (or on bearing **39** where one is used) to minimize entanglement of the inner ends of wires. Since entanglement of wires normally occurs only near the hub of the holder, the internal discs could normally have a lesser diameter than the diameter of the circumferential wall **14**.

The capacity of a holder constructed in accordance with the present invention is a function of the diameter of the circumferential wall and the distance between the plates. By adjusting these dimensions, the capacity of the holder may be varied to handle any reasonable number of wires or number of types of wires. To illustrate the adjustments in capacity which are possible, two different sizes of holders have been built. The larger of the two holders has a circumferential wall diameter of 14.5 inches, a total width of 3.75 inches, and 25 peripheral openings. It was found that this holder had a capacity of 2,000 No. 26 AWG wires, each 3 feet long. The smaller of the two holders was 12.0 inches in diameter, had a total thickness of 1.75 inches and contained 24 peripheral openings. The capacity of the smaller unit was approximately 1,000 No. 26 AWG wires, each 3 feet long.

Where a user wishes to utilize only standardized holders but finds that he requires more wire-holding capacity than a single holder can provide, two or more holders can be easily grouped to provide a dispensing arrangement with the desired capacity. FIG. **4** illustrates one of the many groupings which are possible. In that figure, a pair of identical holders **40** and **42** are rotatably supported above a workbench **18** using an inverted L-shaped rod **44** similar to the rod used in the single-holder dispenser shown in FIG. **1**. The two holders are mounted on a single rod by the simple expedient of bending rod **44** to have a longer horizontal leg. Relative motion between the holders **40** and **42** is limited by a spring washer clutch **46** mounted on the rod **44** between the two holders. A second spring

washer clutch **48** is mounted on the rod **44** between the first holder **40** and a stop member **50** welded to rod **44** to damp rotational movements of the combination so that the holders will remain in place as wires are individually extracted. An unlimited number of other kinds of groupings are possible. One grouping which may be preferred in many manufacturing applications would consist of a floor mount having an upper pair of holders and a lower pair of holders, all rotatably secured to the same mount. Floor mounts can easily be located so that a single dispenser serves more than one assembly station. For example, operators at adjacent assembly stations may work from opposite sides of a dispenser combination supported on a floor mount positioned between the two stations.

While there have been described what are regarded as being preferred embodiments of the invention, it must be recognized that variations and modifications therein will occur to those skilled in the art once the invention is known to them. For example, a wire-formed serpentine ring might be used as a circumferential wall member. Similarly, the discs could be wire formed rather than being made of the sheet material shown. It is, therefore, contemplated that the appended claims shall be construed to cover all such variations and modifications as fall within the true spirit and scope of the invention.

I claim:

1. A dispenser for precut lengths of wire including:

a. a holder having a first disc with a centrally located, externally threaded, perpendicular hub with an opening therethrough, a circumferential wall perpendicular to the first disc with a plurality of peripheral openings, and a second disc with an opening therethrough having a centrally located internally threaded element, said holder being adapted to hold precut lengths of wire with one end of each length protruding through one of the peripheral openings; and

b. means for rotatably supporting said holder.

2. A dispenser as recited in claim **1** wherein said holder further includes resilient means secured to said circumferential wall adjacent the peripheral openings, said means serving to restrict movement of wires during rotation of the holder or during extraction of a single wire.

3. A dispenser as recited in claim **1** wherein said discs extend radially beyond said circumferential wall to form wire-protecting flanges.

4. A dispenser as recited in claim **2** wherein said holder further includes a bearing mounted on said hub to provide a freely rotating surface.

5. A dispenser as recited in claim **2** wherein said discs extend radially beyond said circumferential wall to form wire-protecting flanges.

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