

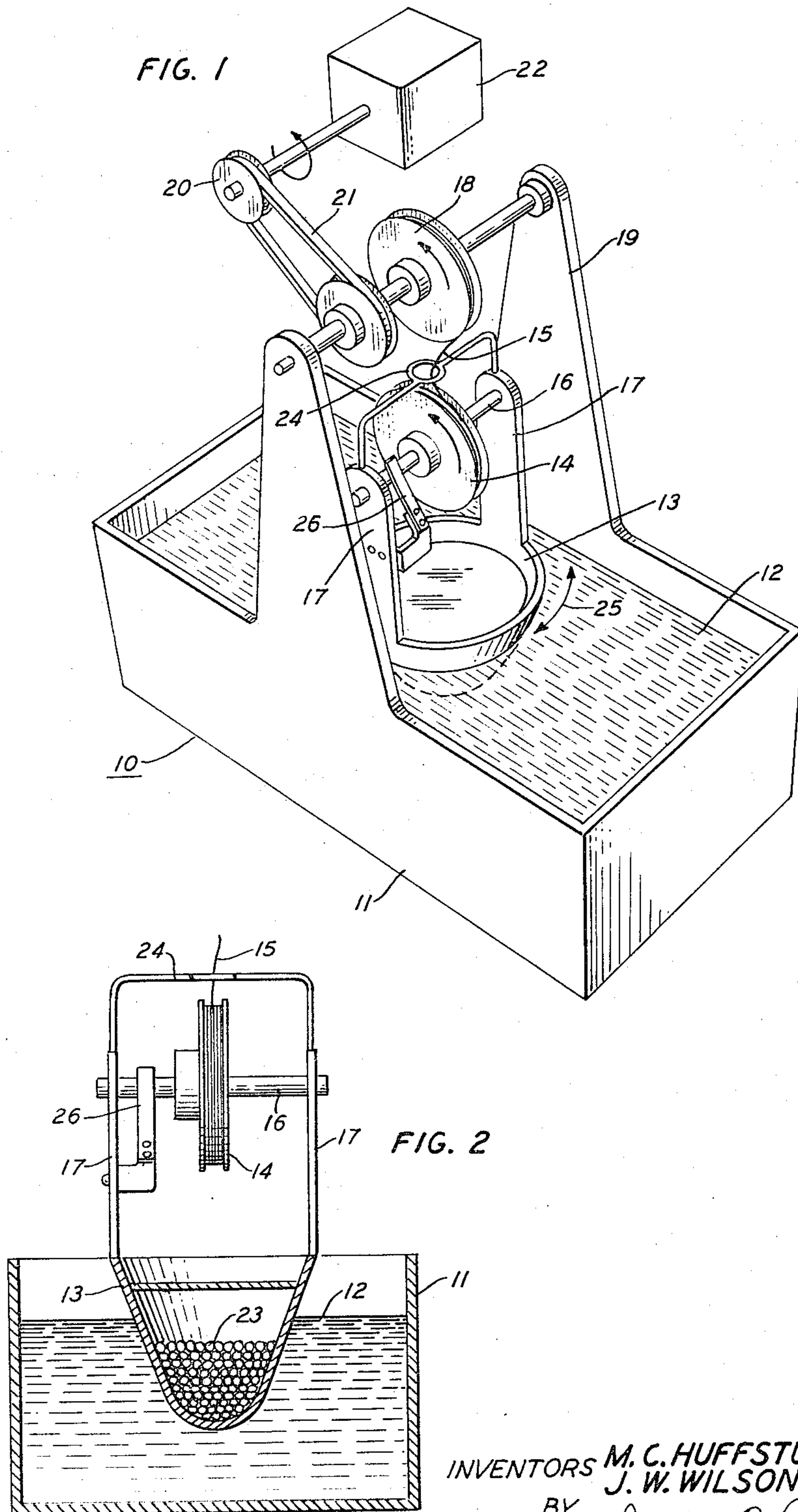
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SPOOLING BOBBIN FOR UNTWISTING WIRE

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SPOOLING BOBBIN FOR UNTWISTING WIRE

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5 Claims. (Cl. 57—1)

This invention relates to wire spooling devices, and specifically to apparatus for substantially eliminating the wound-in wire twist generated in the wire spooling process.

In the manufacture of most sizes of wire, a certain amount of unintended wound-in twist or elastic torsional strain is imparted to the wire as it is fed onto its storing spool. The extent of such twist is greater with smaller diameter wires and is most pronounced in fine wires of 1 to 5 mils in diameter, where frequently it measures two or more radians per meter. For most applications, the wound-in twist is of no particular consequence and hence is ignored. In a few important cases, however, even the slightest degree of twist can be critical. For example, wire that has been electroplated with an outer magnetic film is extremely sensitive to any torsional strain and, in fact, has been found to lose its magnetic uniformity with any change in torsional strain.

Accordingly, one object of the invention is to eliminate simply and inexpensively the wound-in twist often found in spooled wire.

A further and broader object of the invention is to produce wire which has substantially no twist in the first instance.

These and other objects are accomplished in accordance with the invention by a spooling device in which the wire is respooled from one bobbin floating in a low-viscosity liquid onto another bobbin rigidly mounted above it.

In one illustrative embodiment, the lower bobbin containing the twisted wire is affixed to a boat or dish which floats freely on the surface of a liquid. The axis of rotation of the lower bobbin is parallel to the liquid surface. The dish's axis of rotation is perpendicular to the liquid surface, as are the planes of rotation of both bobbins. Pursuant to the invention, as the upper bobbin is slowly reeled, any torque present in the wire is translated into rotational movement of the dish and the wire is thus untwisted.

The primary feature of the invention resides in a free floating spooling bobbin containing the wire with undesired twists therein, which rotates on a liquid surface in response to the unraveling of the wire from the floating bobbin.

Other objects and features of the invention will be described in the recitation to follow of an illustrative embodiment thereof and in the drawing in which:

FIG. 1 is a perspective view of apparatus embodying the invention; and

FIG. 2 is a sectional side view of the apparatus.

In FIG. 1 the inventive apparatus, designated generally as 10, is shown comprising a vessel 11 for holding a low viscosity liquid 12 such as water, water-alcohol solutions, or a low-vapor pressure organic liquid, and a floating dish 13 on which a lower spooling bobbin 14 is mounted. A fine wire 15 containing some unwanted elastic torsional strain is wound upon bobbin 14. Supports such as 17 mount bobbin 14 for rotational movement

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about its horizontal axis 16. Wire 15 typically is 2 mils in diameter; and bobbin 14 may be 5 inches in diameter and 1/2-inch long, to accommodate up to 1000 feet of such wire. An adjustable frictional drag such as 26 restrains the rotation of the bobbin 14 to prevent uncontrolled uncoiling.

Above bobbin 14, a second similar bobbin 18 is fixedly mounted with respect to vessel 11 by some means such as arms 19. The rotational axis of bobbin 18 is parallel to the surface of liquid 12. Motive means such as pulley 20, belt 21, and drive 22 cause bobbin 18 to revolve slowly at about 1 r.p.m. for example.

As seen in FIG. 2, dish 13 advantageously is deeply bowl-shaped and has smooth outer sides to reduce frictional drag with the liquid to a minimum. Since dish 13 will respond more readily to applied torsional forces when it is relatively light, it is desirable to construct it with as little mass as possible. Further, an over-all shape for the assembly of dish 13 and bobbin 14 that exhibits a low moment of inertia is preferred for the same reason. The bowl bottom of dish 13 lies under the center of gravity of the dish 13-bobbin 14 assembly. Weights 23 are placed as ballast in the dish bottom. This arrangement lowers the metacentric height of the structure without adding unduly to its moment of inertia. It is preferable to include a wire guide such as 24 to feed the wire 15 from bobbin 14 in a direction as nearly as possible in line with a vertical drawn through the dish bottom, so that a smooth rotational movement of dish 13 is realized.

As bobbin 18 slowly revolves, wire 15 is fed up from bobbin 14 through the wire guide 24. Any torsional strain present in wire 15 at any given time is translated into rotational motion of dish 13 as shown by double arrow 25.

Apparatus constructed in accordance with this invention makes possible the removal of wound-in twist in fine wire to the extent that the end product does not exceed two radians of twist in 800 meters. The same apparatus illustrated may readily be employed in the production of wire, as a way of avoiding the impartation of twist to the wire.

It is to be understood that the above-described arrangements are merely illustrative of the application of the principles of the present invention. Various other arrangements may be devised by those skilled in the art without departing from the spirit and scope of the claims to follow.

What is claimed is:

1. Wire spooling apparatus comprising a rotatable bobbin containing a wire having wound-in twist, a low viscosity liquid, means for floating said bobbin upon the surface of said liquid, and means for unwinding said wire from said bobbin, the latter rotating upon the surface of said liquid in response to release of torsional strain present in said wire, whereby the wound-in twist is removed.

2. Apparatus in accordance with claim 1 wherein said low viscosity liquid is water.

3. Apparatus in accordance with claim 1, wherein said floating means comprises a deep dish with ballasting in the center thereof, and means for rotatably mounting said bobbin centrally on said dish.

4. Apparatus in accordance with claim 3 wherein said unwinding means comprises a reel for receiving the wire for the rotatable bobbin, and means for slowly revolving said reel.

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5. Apparatus in accordance with claim 4, further including means for guiding the wire away from said rotatable bobbin in approximate vertical alignment with the center of gravity of said dish and bobbin combination.

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