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(54) **Spool for winding yarns**

(57) Spool for winding yarn, comprising a substantially cylindrical central core (11), hollow inside, and a flange (13) attached to a first end (12) of the central core

(11), wherein both the central core (11) and the flange (13) are made of aluminium alloy and zinc or similar alloys of very high resistance.

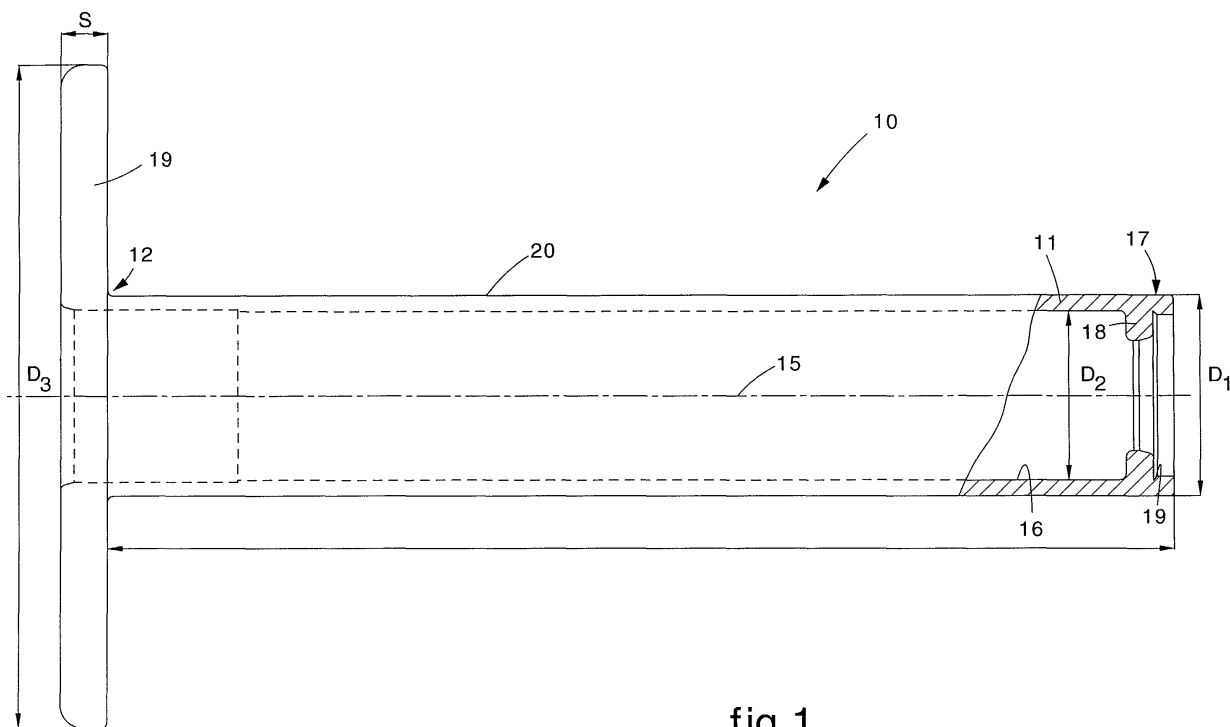


fig.1

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Description

[0001] The invention concerns a metal spool for winding yarns, particularly thin or extra thin yarns, with a count of about 20-30 denier, of the type able to be used, for example, to make women's stockings. The spool allows to make very consistent bobbins, weighing about 3.5-4 Kg or more, and to work at very high winding speeds, in the region of about 2,000 metres per minute.

BACKGROUND OF THE INVENTION

[0002] In the state of the art, a yarn with a greater or lesser degree of elasticity, wound onto the central core of a spool, discharges very high forces onto said spool, when it settles; these forces directly depend on the number of coils wound and can generate pressure on the core itself in the range of several hundred bar.

[0003] To prevent the central core from being deformed due to this pressure, it is therefore necessary for the spools to be very strong and resistant. At the same time, however, the spools have to be quite light, so that they can be easily handled by the workers who have to move the full spools, usually manually, for example from a winding machine of the bobbins to another machine for weaving or making up.

[0004] The state of the art includes a metal spool consisting of a central cylindrical core, hollow inside, and a single flange welded to one end of the central core. This conventional spool weighs about 700 g, has a standardized length of 280 mm and a size such as to allow to form spools of yarn with a weight of about 600-700 g, so that the ratio between the weight of the wound yarn and the weight of the empty spool is about 1:1.

[0005] Considering the winding time of a yarn with a count of 20-30 denier, at a winding speed of about 2,000 metres per minute, is in the region of 10-15 minutes, this means that the worker has to handle each cop (bobbin wound on the spool) moving it from one machine to another, after a relatively short time.

[0006] This is a limit which considerably reduces productivity, since the time needed to handle each cop by the worker has a negative affect on the whole working cycle.

[0007] The present Applicant has devised and embodied this invention to overcome this shortcoming and to obtain further advantages as will be explained hereafter.

SUMMARY OF THE INVENTION

[0008] The spool for winding yarns according to the invention is set forth and characterized in the main claim, while the dependent claims describe other innovative characteristics of the invention.

[0009] One purpose of the invention is to achieve a spool which, also with a standardized length, a limited weight and easy to handle, allows to wind a large quan-

tity of yarn, in the region of about 3,500-4,000 g, particularly of fine or super-fine yarn, that is to say, with a count of about 20-30 denier.

[0010] In this way, although the weight of the spool is contained to a value scarcely above the weight of conventional spools, the ratio between the weight of the yarn wound onto the bobbins and the weight of the empty spool increases by about three times compared with the state of the art.

[0011] In accordance with this purpose, the spool according to the invention comprises a substantially cylindrical central core, hollow inside, and a flange at one end thereof, both made of aluminium alloy and zinc or similar alloys with very high resistance.

[0012] Advantageously the aluminium alloy is the one known internationally under the registration number 7075 or similar.

[0013] The central core has an outer diameter of between about 49 and 53 mm and an inner diameter of between about 41 and 45 mm, while the flange has a thickness of between about 11 and 13 mm and an outer diameter of between about 166 and 170 mm.

[0014] The overall weight of the spool is between about 1,200 and 1,300 g.

[0015] Another purpose of the invention is to achieve a spool which allows to detect, easily and automatically, when the yarn has finished unwinding around its central core, using photo detector systems of a conventional type.

[0016] In accordance with this purpose, at least part of the central core of the spool is light absorbent. To be more exact, the central core comprises a dark surface, made for example by anodizing the aluminium alloy of which the central core is made, which otherwise would reflect the light.

BRIEF DESCRIPTION OF THE DRAWINGS

[0017] These and other characteristics of the invention will be clear from the following description of a preferential embodiment, given as a non-restrictive example with reference to the attached drawings wherein:

Fig. 1 is a side view, partly sectioned, of a spool according to the invention.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENT

[0018] With reference to Fig. 1, a spool 10 according to the invention comprises a central core 11, substantially cylindrical in shape, to the first end 12 of which a flange 13 is friction welded, arranged substantially orthogonal to the longitudinal axis 15 of the central core 11.

[0019] The central core 11 is provided inside with a cylindrical cavity 16, coaxial with the longitudinal axis 15 and through, and is shaped in such a manner as to have,

at a second end 17 thereof, an annular ribbing 18 and an annular seating 19 to house a conventional count marker, not shown in the drawing, for example of the type described in the Italian patent n°. 1.299.748 granted to this Applicant on 4 April 2000.

[0020] Both the central core 11 and the flange 13 are advantageously made of aluminium alloy 7075 or similar.

[0021] The central core 11 has a length L of about 268 mm, an outer diameter D_1 of about 51 mm and an inner diameter D_2 of about 43 mm, while the flange 13 has a thickness S of about 12 mm and an outer diameter D_3 of about 168 mm.

[0022] The overall weight of the spool 10 is about 1,250 g.

[0023] On the spool 10 as described above, up to 3,500-4,000 g of yarn can be wound, with a count of about 30 denier, without the central core 11 deforming under the considerable pressure, about 350 bar, exerted by the wound yarn.

[0024] The time needed to completely wind the yarn, at a winding speed of about 2,000 metres per minute, is about 60-65 mins.

[0025] The outer surface 20 of the central core 11 is anodized and black, or in any case a very dark color, so that it is light absorbent, unlike the yarn wound onto the spool 10 which is usually light in color and hence reflects the light. In this way, any conventional photocell, not shown in the drawing, is able to recognize when the yarn has finished unwinding from the spool 10, and send a corresponding electric signal able to stop the machine on which the spool 10 is mounted.

[0026] It is obvious however that modifications or additions can be made to the spool 10 as described heretofore, without departing from the spirit and scope of the invention.

[0027] It is also obvious that, although the invention has been described with reference to a specific example, a skilled person shall be able to achieve many other equivalent forms of spool, all of which shall come within the field and scope of this invention.

Claims

1. Spool for winding yarn, comprising a substantially cylindrical central core (11), hollow inside, and a flange (13) attached to a first end (12) of said central core (11), the spool being **characterized in that** said central core (11) and said flange (13) are made of aluminium alloy and zinc or similar alloys of very high resistance.
2. Spool as in Claim 1, **characterized in that** said aluminium alloy is the one known internationally under the registration number 7075 or similar.
3. Spool as in Claim 1, **characterized in that** said cen-

tral core (11) has substantially an outer diameter (D_1) of between about 49 and 53 mm and an inner diameter (D_2) of between about 41 and 45 mm.

4. Spool as in Claim 1, **characterized in that** said flange (13) has substantially a thickness S of between about 11 and 13 mm and an outer diameter (D_3) of between about 166 and 170 mm.
5. Spool as in Claim 1, **characterized in that** the overall weight of said central core (11) and said flange (13) is between about 1,200 and 1,300 g.
6. Spool as in Claim 1, **characterized in that** said central core (11) is provided inside with a cylindrical cavity (16), coaxial to its longitudinal axis (15) and through, and is shaped in such a manner as to have, at a second end (17) thereof, an annular ribbing (18) and an annular seating (19) to house a count marker.
7. Spool as in Claim 1, **characterized in that** at least a part of said central core (11) is light absorbent.
8. Spool as in Claim 1, **characterized in that** said central core (11) comprises a dark surface, made by anodizing said aluminium alloy and zinc or other similar alloy of very high resistance.

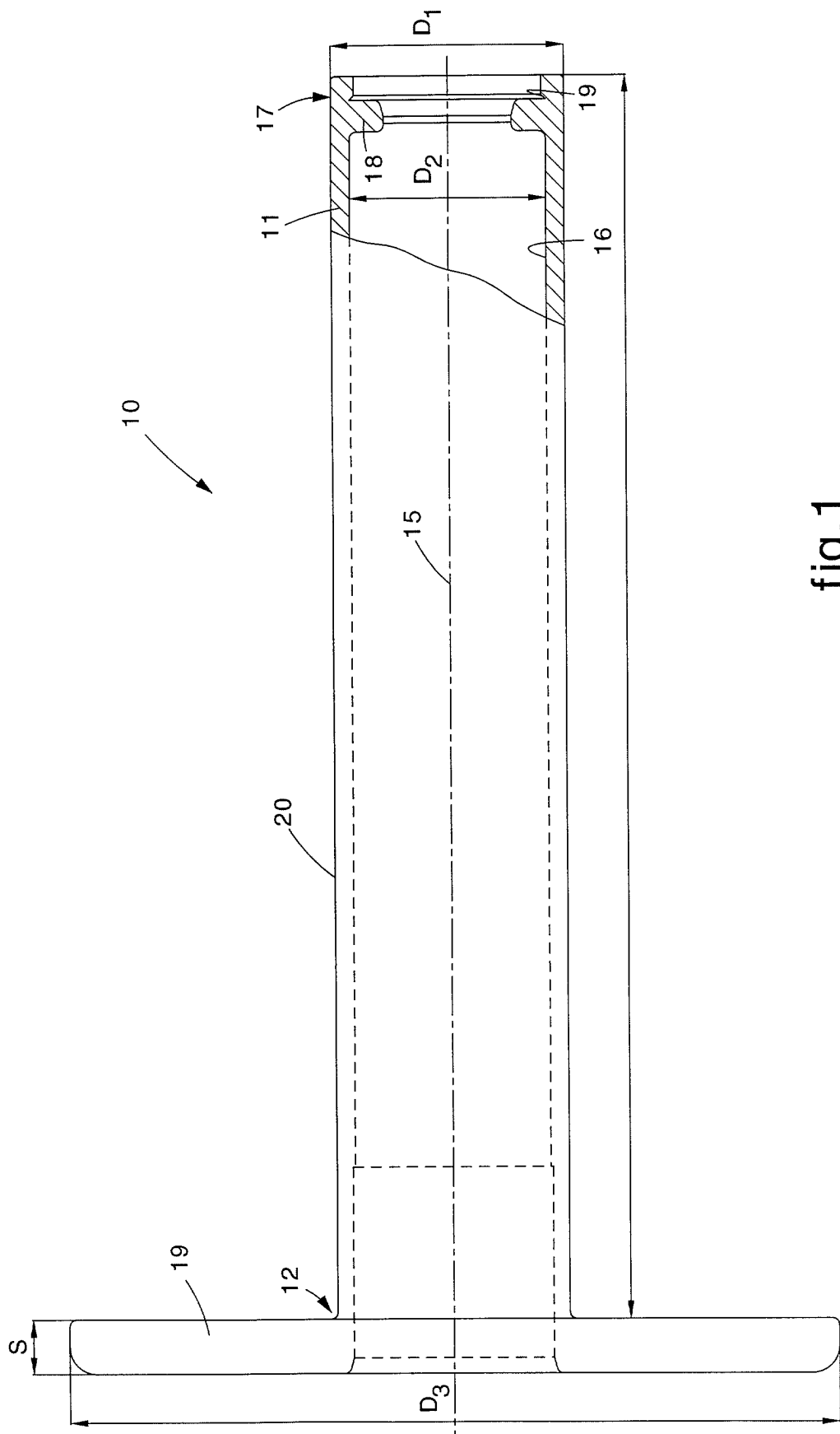


fig.1



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EUROPEAN SEARCH REPORT

Application Number
EP 01 83 0037

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Place of search THE HAGUE		Date of completion of the search 2 July 2001	Examiner D'Hulster, E
CATEGORY OF CITED DOCUMENTS X: particularly relevant if taken alone Y: particularly relevant if combined with another document of the same category A: technological background O: non-written disclosure P: intermediate document T: theory or principle underlying the invention E: earlier patent document, but published on, or after the filing date D: document cited in the application L: document cited for other reasons &: member of the same patent family, corresponding document			

EPC FORM 1503 03 82 (P04C01)



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THE HAGUE		2 July 2001	D'Hulster, E
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