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SELF-INDICATING FILAMENTARY SUPPLY

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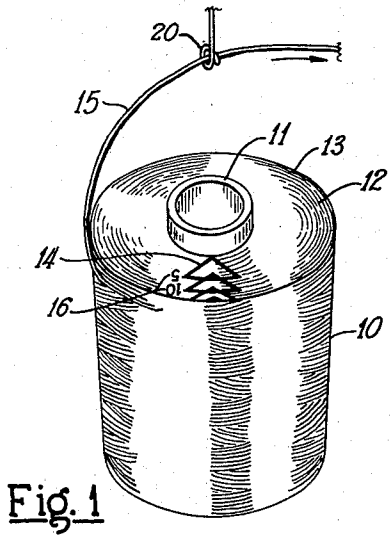


Fig. 1

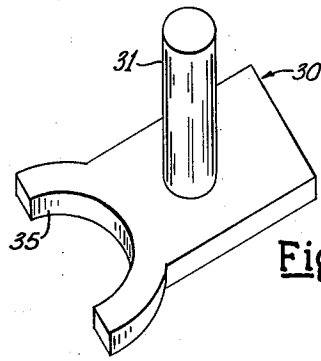


Fig. 2

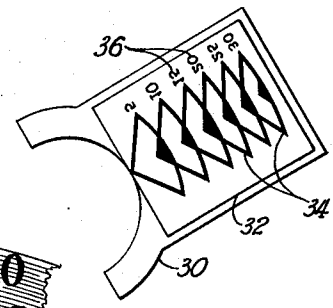


Fig. 3

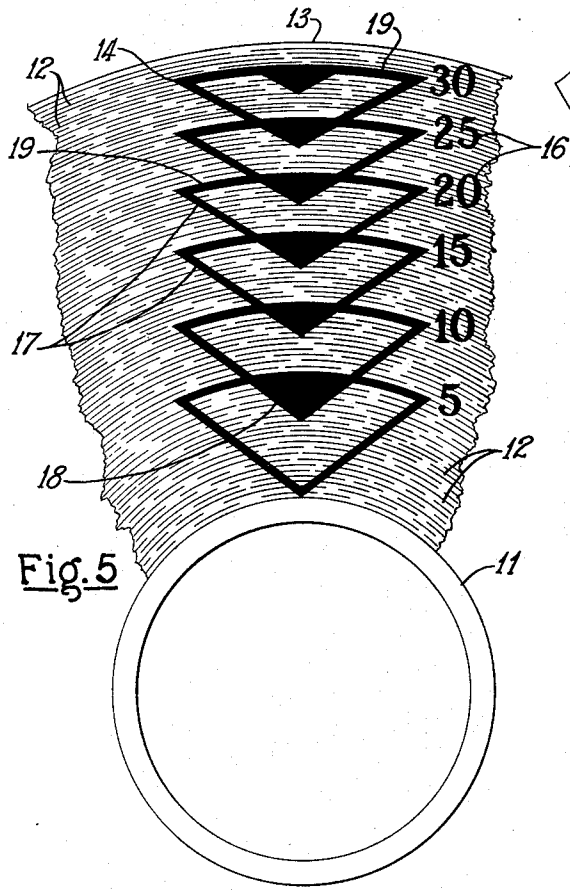


Fig. 5

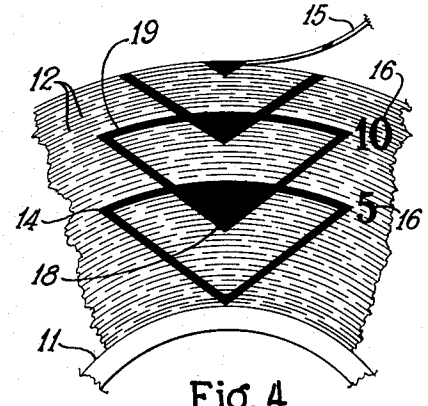


Fig. 4

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SELF-INDICATING FILAMENTARY SUPPLY

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The present invention relates to wound supplies of continuous filamentary material, and more particularly the invention relates to supplies of filamentary material that are wound in the form of a plurality of superimposed layers of the material.

The principal object of this invention is the provision of a wound supply of continuous filamentary material that is visibly self-indicating as to the quantity of the material contained in the supply at any given time during the existence or utilization of the supply.

A further object of the invention is the provision of a wound supply of filamentary material incorporating a quantity indicating means that is a visible, readily readable, integral part of the supply.

An ancillary object of this invention is the provision of a wound supply of filamentary material incorporating an integral quantity indicating means adapted to identify more than one characteristic of the supply material.

Briefly described, this invention is a wound supply of continuous filamentary material composed of a plurality of superimposed layers of adjacent coils of the material having edges associated to form an exposed surface, and indicia integrally affixed on the exposed surface and arranged to represent increments of the quantity of the material in the supply. The indicia may be imprinted or otherwise formed on the exposed surface in one or more colors in conformance with a color code system to identify characteristics of the filamentary material of the supply.

The supply of this invention affords many advantages to the producer and the user thereof. The supply may be wound directly as the filamentary material is produced in a filament forming process or it may be wound from previously formed sources of supply. Conventional winding apparatus may be utilized to form the supply. The quantity indicating marking or indicia may be readily and economically applied to the supply. It provides a means for ready identification of the origin and other characteristics of the filamentary material of the supply. It provides a ready means for taking inventory for the producer and the user. It permits the user to tell at a glance how much material is being used in a product fabricated from the material of the supply and assists him in unwinding the particular quantity of the material desired on a given occasion of use. Further, it permits the user to tell at a glance how much material remains in the supply at any given time.

The aforegoing objects and advantages of the invention and other objects and advantages which hereinafter appear may be fully understood from a study of the following detailed description taken in connection with the accompanying drawing which is illustrative of a preferred embodiment of the invention, it being understood, however, that the invention is not restricted to a strict conformity with the showing in the drawing but may be changed and modified as long as such changes make no material departure from the salient features of the invention as expressed in the appended claims.

In the drawing:

FIGURE 1 is a perspective view of a wound supply of continuous filamentary material embodying the principles of the invention, the filamentary material illustrated as being continuously withdrawn from the supply for further processing;

FIGURE 2 is a top plan view, in perspective, of apparatus for applying indicia to a core wound supply of filamentary material and similar in configuration to a supply of the type illustrated in FIGURE 1;

FIGURE 3 is a bottom plan view illustrating the indicia producing surface of the apparatus of FIGURE 2;

FIGURE 4 is an enlarged, fragmentary end view of the indicia bearing surface of the partially consumed wound supply of FIGURE 1 slightly modified as to the point at which the filamentary material is being withdrawn from the supply; and

FIGURE 5 is an enlarged, fragmentary end view of the indicia bearing exposed surface of an unused wound supply of filamentary material constructed in accordance with the concepts of this invention.

Referring now to the drawing in greater detail, FIGURE 1 depicts one form of a visibly self-indicating wound supply of continuous filamentary material constructed in accordance with the principles of the present invention, and from which the filamentary material **15** is being withdrawn and fed in the direction of its length through a suitable guide **20** to suitable apparatus (not shown) for further processing. The body of the supply **10** is built up of continuous length filamentary material **15** which has been serially wound on a core **11** in a manner to form a plurality of superimposed layers **12** of adjacent coils or convolutions of the material. The layers **12** are substantially of equal length in a direction axial of the core **11** and have edges or end potrions which are associated to form a common exposed surface **13** extending radially from the core **11**.

Integrally imposed on the exposed surface **13** and radially extending from the inner periphery thereof are measuring marks or indicia **14** calibrated and arranged to represent increments of the quantity of filamentary material in the supply **10**. Adjacent the indicia **14** are quantity indicating numerals **16**. In this instance each successive numeral toward the core **11** is indicative of a proportionally lesser quantity of filamentary material in the supply.

By this arrangement as the filamentary material **15** is serially withdrawn from the supply **10**, the exposed surface **13** is progressively depleted in proportion to the quantity of filamentary material **15** withdrawn from the supply **10** thereby providing the user with a ready indication of the quantity of material remaining in the supply at any given time during the withdrawal.

In FIGURES 2 and 3 of the drawing, there is illustrated an apparatus for the application of indicia to the exposed, substantially flat surface of a core wound supply of filamentary material, similar in configuration to that shown in FIGURE 1. The device is essentially a manually operable stamp composed of a stamp body **30** having a hand grip **31** affixed to the top surface thereof. The frontal portion of the body **30** has an arcuate cut out portion which forms a wall surface **35** adapted to conform to and engage the projecting circumferential outer wall of the core of the supply in a concentric, semi-encircling, snug fitting relationship which insures an accurate application of the indicia to the exposed surface of the supply.

Affixed to the bottom surface of the stamp body **30** is indicia reproducing surface **32** formed of a suitable stamping material, such as rubber or gelatin. Engraved on the surface **32** are indicia **34**, and quantity indicating numerals **36** which have been calibrated and arranged in relation to the quantity of filamentary material contained in the particular configuration of the supply they are to imprint.

The location of and spacing between indicia **34** may be computed mathematically, or it may be done by actually unwinding the filamentary material from a supply formed in accordance with a predetermined manufactur-

ing standard, and measuring the quantities of filamentary material at given points of depletion of the exposed surface of the supply. By either method, accurate location of the indicia can be established for the exposed surface of any given configuration of the supply.

It is to be noted that when the exposed surface of the supply has been wound to a contour other than the relatively flat surface illustrated in FIGURE 1, such as for example an exposed surface that is slightly tapered in a direction toward the outer periphery of the supply, that the indicia reproducing surface 32 will be contoured in accordance with the taper or other configuration of the exposed indicia bearing surface for full complementary engagement therewith.

In the utilization of the stamp, the indicia reproducing surface 32 is inked with one or more colors by impressing it against a suitable inking pad. It is then positioned in relation to, and brought into engagement with, the exposed surface of the supply for reproduction of the quantity indicating indicia thereon.

In FIGURE 4 of the drawing the exposed indicia bearing surface 13 of FIGURE 1 is shown in a stage where the filamentary material 15 is being withdrawn from the zone bearing the quantity indicating indicia 14. The depletion of the exposed surface and of the indicia thereon by the serial withdrawal of the edge portions or end convolutions of the layers 12 of filamentary material 15 is clearly indicated, as is the progressive reduction in the magnitude of the marking on the supply. In this instance, as also is shown in FIGURE 1, the serial withdrawal of the filamentary material 15 from the supply is illustrated as having progressed to a stage where between 12½ and 15 pounds or approximately 13½ pounds of filamentary material remain in the supply. In this connection the indicia 14 are overlapping sectors, or triangles each having an arcuate base 19. The triangles are so arranged that their arcuate bases are spaced to represent 5 pound increments of the filamentary material of the supply, while the apices of the overlapping portions 18 of the indicia are solid markings and so located as to subdivide the 5 pound quantities contained between adjacent arcuate bases. In other words, the solid overlap portions 18 each represent 2½ pound quantities of the supply.

In FIGURE 5 there is illustrated an exposed indicia bearing surface 13 constructed substantially similarly to that shown in FIGURES 1 and 4 with the slight modification that in this instance the exposed surface is representative of an undepleted or unused supply of filamentary material. The quantity indicating indicia 14 have been integrally affixed to the exposed surface 13 in the form of overlapping triangles or sectors radially spaced from the innermost of the layers 12 adjacent the core 11 and extending toward the outermost layer, and compose a readily readable, continuous graduated marking.

The quantity of filamentary material in the supply is subdivided into equal 5 pound increments by the arcuate, graduated base portions 19 of the indicia 14. In turn, the 5 pound increments are subdivided into 2½ pound increments by the calibrated, overlapping, solid portions 18 of the indicia.

The layers 12 beyond the outermost of the arcuate portions 19 contain a quantity of filamentary material equivalent to the quantity contained in increments delimited by adjacent arcuate portions, the quantity of the unmarked layers being known by their relation with the outermost indicia. Termination of the marking a short distance from the outermost layers of the supply is advantageous in marking supplies which by the manner of their formation have a tendency for the outermost layer edges to be dislodged or sloughed by the application of pressure thereto, even the slight pressure necessary to affix the indicia. Nevertheless, it is often desirable that the arcuate portion 19 of outermost of the indicia 14 be coextensive with the outermost edge portion or convolution forming

the outer periphery of the exposed surface 13. In this case, the application of the indicia additionally serves as a quality control check, for if the outermost arcuate portion is not coextensive with the outer periphery of the exposed surface, as it has been calibrated to be, it is readily apparent that the supply is out of the manufacturing specification and adjustment must be made in the supply forming equipment.

The portion 19 of each indicia 14 is of appreciable length, and arcuately configured to conform to the contour of the exposed edge portions of the layers 12 to which it is affixed, to facilitate a ready and more accurate reading of the quantity of material in the supply. The imprinted sides 17 of the indicia 14, and the solid portions 18 afford similar assistance to the user in that the indicia has breadth and dimension the eye can follow more readily than single point locations. This is particularly advantageous when the filamentary material is being withdrawn from the supply at a rapid rate and the user is keeping a constant check on the quantity of material being consumed.

Each successive indicating numeral 16 in a direction outwardly from the core 11 is located adjacent its related arcuate portion 19 of the indicia, and in the present instance is indicative of a successively increasing amount of the total quantity of material wound about the core 11. If desired, another set of indicating numerals may be similarly located adjacent the other side of the indicia, in corresponding or inverse order to that shown. If two sets of indicating numerals are provided, one the inverse of the other, the user may unwind the supply from the outside thereof or remove the core and unwind the supply from the interior thereof with no diminution in the ease of reading the quantity of material being consumed.

As previously mentioned, the indicia may be imprinted in one or more colors in conformity with a color code system to identify various properties or characteristics of the filamentary material, such as its origin, the nature of the sizing applied thereon, or like information.

While the quantity indications have been described herein in the terms of pounds, as is customary in referring to glass filamentary material, the quantities may be calibrated and expressed in terms of yards, feet, or like units.

Obvious modifications of the invention may be made within the spirit and scope of the following claims.

We claim:

1. A wound supply of continuous filamentary material comprising a plurality of layers of filamentary material, each layer formed of a plurality of coils of the material, a plurality of said layers having edges associated to form an exposed surface adapted to be progressively depleted in proportion to the diminution in the quantity of material in the supply in the process of unwinding the filamentary material from the supply, and visible indicia on said surface arranged to represent increments of the quantity of the material in the supply.

2. A wound supply of continuous filamentary material comprising a plurality of superimposed layers of filamentary material, each layer formed of a plurality of convolutions of the material, said layers having exposed edge portions forming a common surface adapted to be progressively depleted in proportion to the diminution in the quantity of material in the supply in the process of unwinding the filamentary material from the supply, a visible graduated continuous marking on said surface providing a constant indication of the quantity of the material in the supply.

3. A wound supply of continuous filamentary material comprising a plurality of superimposed layers of the filamentary material, each layer formed of a plurality of coils of material, edge portions of a plurality of said layers associated to form a common exposed surface adapted to be progressively depleted in proportion to the diminution in the quantity of material in the supply in the process of unwinding the filamentary material from

the supply, and visible markings integrally affixed on said surface at predetermined spaced intervals to represent increments of the quantity of the filamentary material in the supply.

4. A wound supply of continuous filamentary material comprising a plurality of layers of the filamentary material, each layer formed of a plurality of coils of the material, edge portions of a plurality of said layers associated to form a common exposed surface adapted to be progressively depleted in proportion to the diminution in the quanaity of material in the supply in the process of unwinding the filamentary material from the supply, and visible graduated indicia integrally affixed on said exposed surface and extending between the inner and outer margins of said exposed surface, each graduation of said indicia indicating a given quantity of the filamentary material in the supply.

5. A wound supply of flexible filamentary material having an annular core space around which said material is wound in a plurality of superimposed layers of coils of the material, edges of the layers associated to form exposed common end surfaces, each of said end surfaces adapted to be progressively depleted in proportion to the diminution in the quantity of material in the supply in the process of unwinding the filamentary material from the supply and visible indicia integrally affixed on at least one such end surface calibrated and arranged to represent increments of the quantity of the material in the supply.

6. A wound supply of continuous filamentary material comprising a plurality of layers of the filamentary material, each layer formed of a plurality of coils of the material, edge portions of a plurality of said layers associated to form a common exposed surface adapted to be progressively depleted in proportion to the diminution in the quantity of material in the supply in the process of unwinding the filamentary material from the supply, and visible radially spaced indicia having an appreciable lateral dimension integrally affixed on said surface and arranged to represent increments of the quantity of the filamentary material of the supply.

7. A wound supply of continuous filamentary material comprising a plurality of layers of such material, each layer formed of a plurality of coils of the material, a plurality of said layers having edges associated to form an exposed surface adapted to be progressively depleted in proportion to the diminution in the quantity of material in the supply in the process of unwinding the filamentary material from the supply, and a visible continuous graduated marking integrally affixed on said surface and arranged to represent increments of the quantity of the material in the supply, said marking extending from the innermost exposed edge of said surface to a predetermined distance from the outermost exposed edge of said surface, said marking adapted to be concomitantly depleted with the exposed surface in the process of unwinding the filamentary material from the supply.

8. A wound supply of continuous filamentary material comprising a plurality of layers of filamentary material, each layer formed of a plurality of coils of the material, a plurality of said layers having edges associated to form an exposed surface adapted to be progressively depleted in proportion to the diminution in the quantity of material in the supply in the process of unwinding the filamentary material from the supply, and visible indicia on said surface arranged to represent increments of the quantity of the material on the supply, said indicia imprinted on said surface in more than one color to identify selected characteristics of the filamentary material of the supply.

9. A wound supply of filamentary material comprising a plurality of layers of such material, each of said layers comprised of a plurality of coils of the material, a plurality of said layers having exposed edges associated to form a common exposed surface adapted to be progressively depleted in proportion to the diminution in the quantity of material in the supply in the process of unwinding the filamentary material from the supply, and a continuous graduated marking integrally affixed on said surface and extending radially from the innermost exposed edge of said surface to a predetermined distance from the outermost exposed edge of said surface, said marking comprised of a plurality of overlapping triangles having arcuately configurated bases, the apices of said triangles directed towards the innermost exposed edge of said surface, said arcuately configurated bases being arranged to represent increments of the quantity of filamentary material in the supply, the overlapping portions of said triangles arranged to represent one-half of the increment represented by the corresponding arcuately configurated bases which they overlap.

10. A wound supply of filamentary material comprising a plurality of layers of such material, each of said layers comprised of a plurality of coils of the material, a plurality of said layers having exposed edge portions associated to form a common exposed surface adapted to be progressively depleted in proportion to the diminution in the quantity of material in the supply in the process of unwinding the filamentary material from the supply, and a continuous graduated marking integrally affixed on and extending radially from the innermost exposed edge portion of said surface to a predetermined distance from the outermost exposed edge portion of said surface, said marking comprised of a series of overlapping triangles having arcuately configurated bases, said bases conforming substantially in contour to the exposed edge portions of the layers to which they are affixed, the apices of said triangles extending in the direction towards the innermost exposed edge portion, said arcuately configurated bases arranged to represent increments of the quantity of filamentary material in the supply, each overlapping portion of said triangles arranged to represent one-half of the increment represented by the arcuately configurated base overlapped, and quantity indicating numerals adjacent each of said arcuately configurated bases.

11. A wound supply of filamentary material comprising a plurality of layers of such material, each of said layers comprised of a plurality of coils of the material, a plurality of said layers having exposed edges associated to form a common exposed surface adapted to be progressively depleted in proportion to the diminution in the quantity of material in the supply in the process of unwinding the filamentary material from the supply, and a continuous graduated marking integrally affixed on said surface and extending radially from the innermost exposed edge of said surface to the outermost exposed edge of said surface, said marking comprised of a plurality of overlapping triangles having arcuate bases, the apices of said triangles directed toward the innermost exposed edge of said surface, said arcuate bases arranged to represent increments of the quantity of the material in the supply, said arcuate bases conforming substantialily in contour to the exposed edges to which they are affixed, the outermost of said arcuate bases being substantially coextensive with the outermost exposed edges of said surface, each overlapping portion of said triangles arranged to represent one-half of the increment of the total quantity of filamentary material of the supply represented by the arcuate base which is overlapped.

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