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(54) METHOD OF COATING A TAPE MEASURE BLADE

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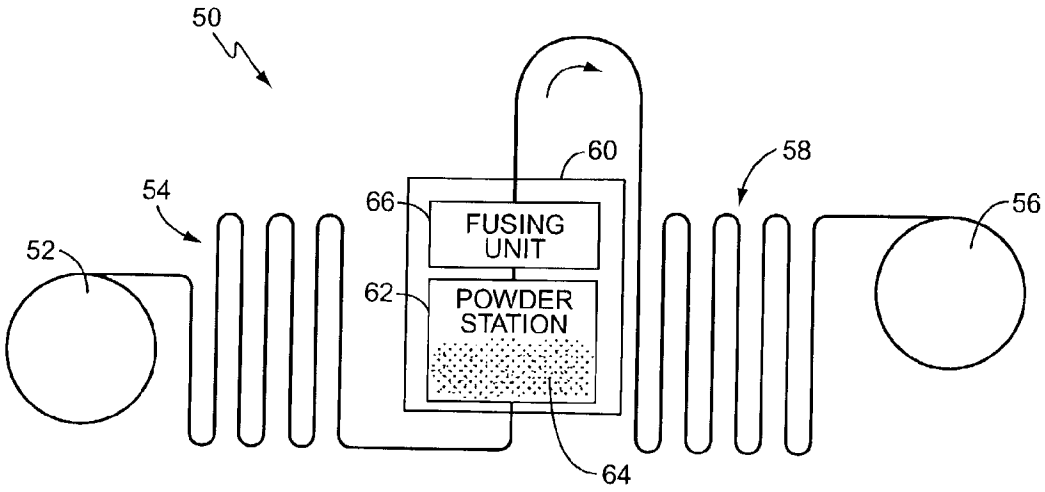
(57) **ABSTRACT**

A metallic tape blade may be substantially coated with a powder and then passed through an induction unit to heat the powder and form a coating on the blade, with the blade having a concavo-convex cross-section when passing through the induction unit. Alternatively, the metallic tape blade is substantially covered with a powder consisting essentially of nylon having a particle size of 20 microns or less and then passed through an induction unit to heat the blade and form a nylon coating derived from the powder thereon. Alternatively, a nylon coating is applied to the metallic tape blade, with the coating having a thickness of not more than 0.0015 inches and an abrasion resistance according to ASTM D968-81 of at least 30 liters of sand. One or more of these aspects may be combined to form a tape blade having a protective coating thereon.



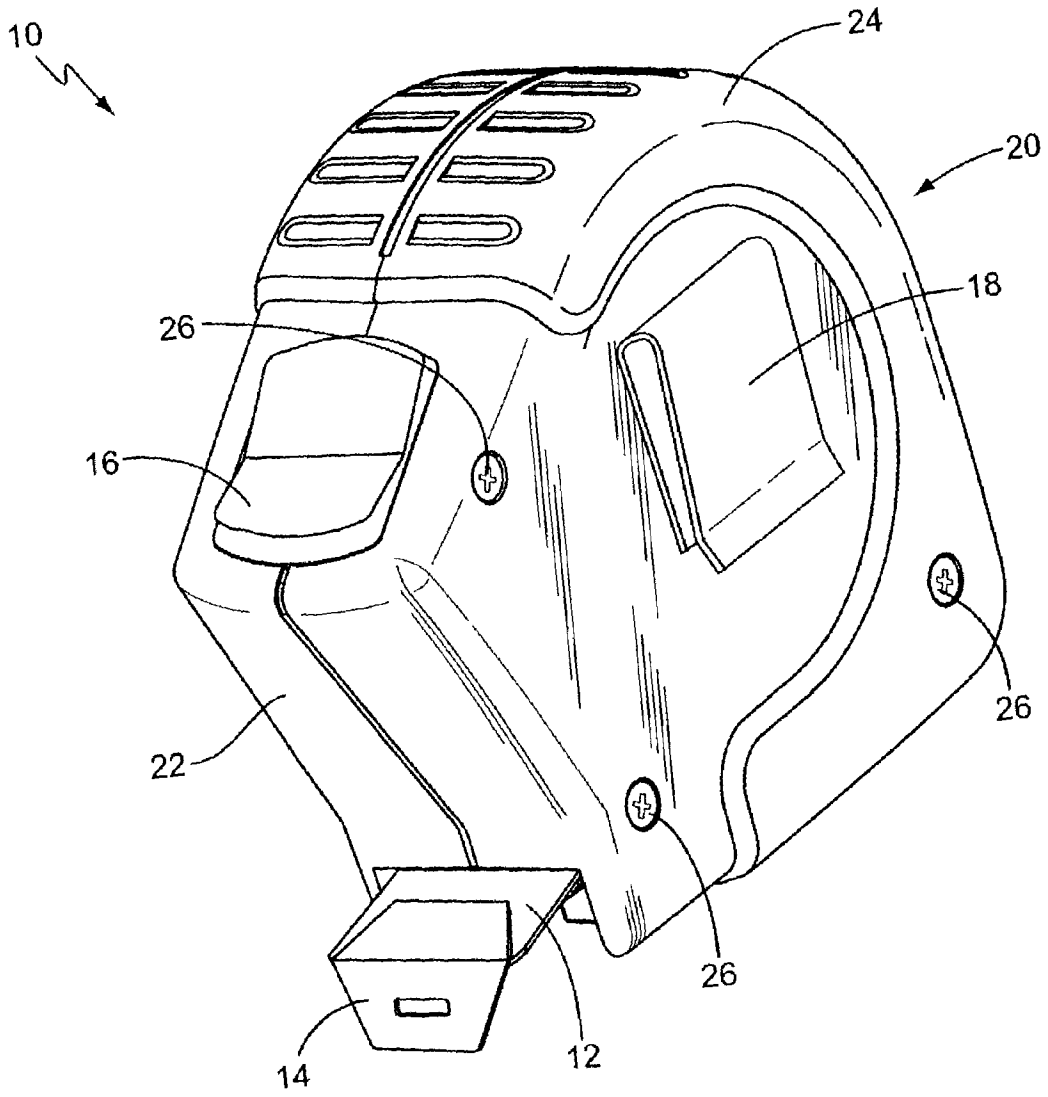


FIG. 1

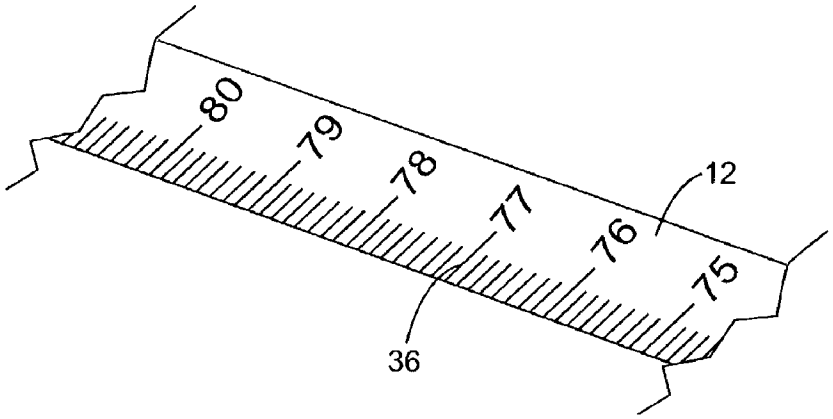


FIG. 2

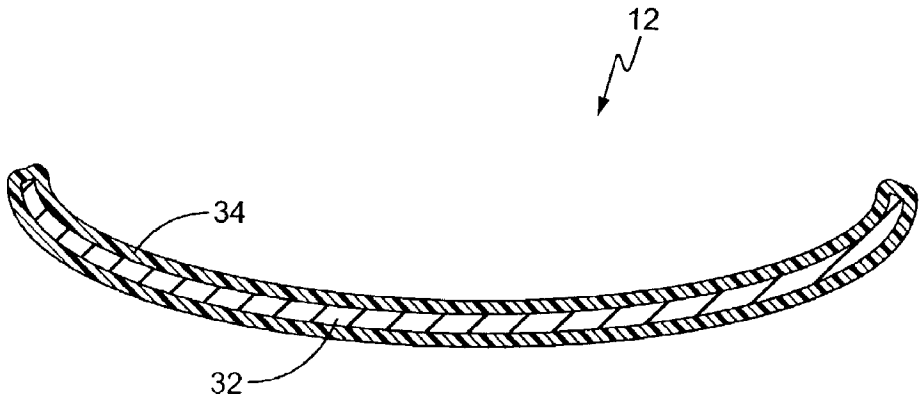


FIG. 3

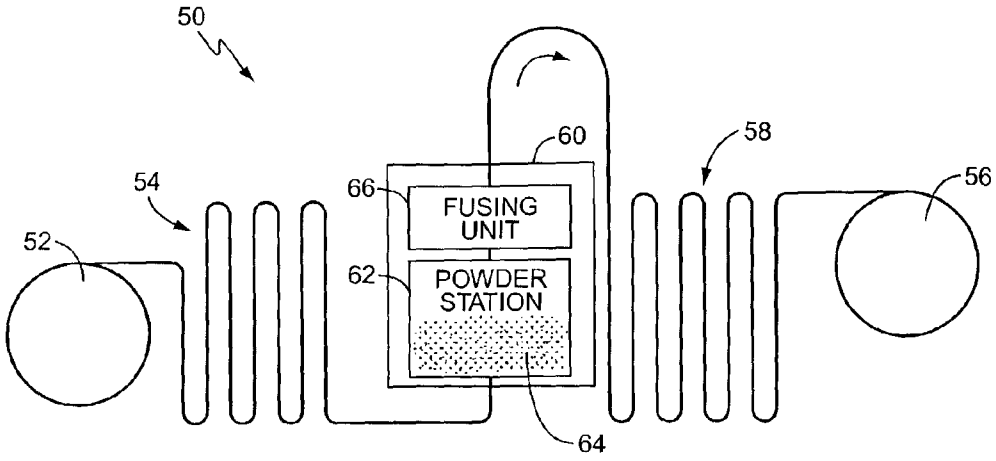


FIG. 4

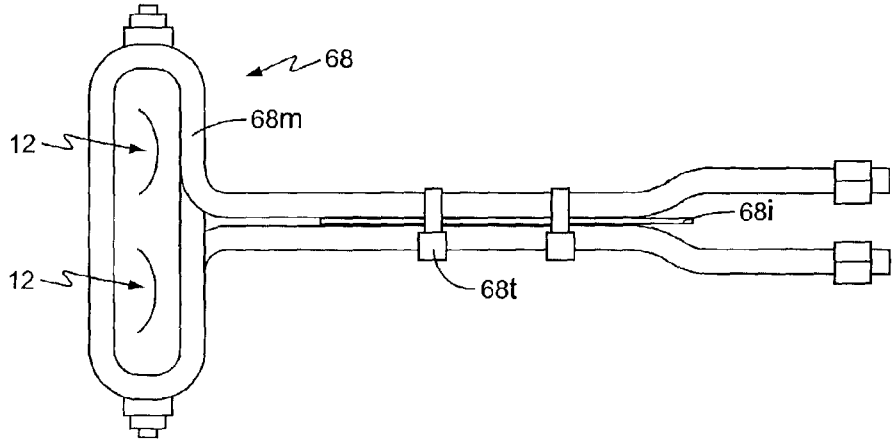


FIG. 5A

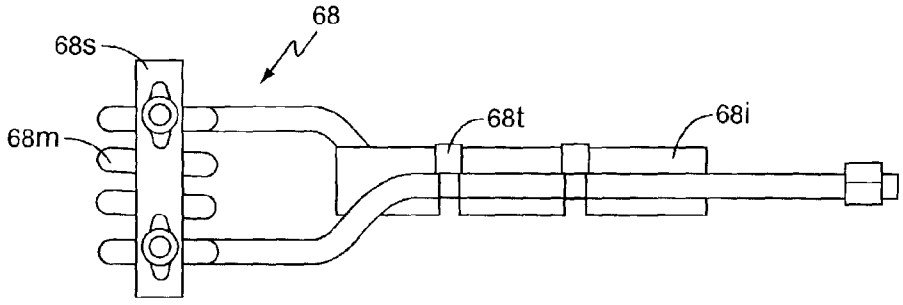


FIG. 5B

METHOD OF COATING A TAPE MEASURE BLADE

FIELD OF THE INVENTION

[0001] The present invention is directed generally to tape measures and, more particularly, to a coated tape measure blade and a method of making the same.

BACKGROUND OF THE INVENTION

[0002] Modern power return tape measures (or "tape rules") typically include a coiled tape that is spring-biased towards a retracted position. A housing generally surrounds protects the tape and biasing spring and includes an opening through which a distal end of the tape extends. The distal end of the tape is pulled away from the housing during use, and when released, the spring pulls the tape back into the housing so that the tape returns to the retracted position.

[0003] The tape blades for such devices are typically formed from a metal ribbon that assumes a concavo-convex configuration when outside the housing, but that is wound into a revolute coil inside the housing with each layer of the coil having a flat cross-section. While the base material of the blade is typically metal, the surface of the blade material is rarely bare metal. Instead, the blade material is typically painted, printed with length indicia, and then coated with a polymer coating to improve abrasion resistance and/or reduce friction. This polymer coating is typically applied by passing the ribbon material over a coating roller and then through an oven to cure the coating.

[0004] Obviously, increasing the blade coating thickness has the beneficial effect of increasing the abrasion resistance; however, increasing the coating thickness increases also the space consumed by the coiled blade, thereby deleteriously increasing the overall size of the tape measure.

[0005] Separately, the conventional technique of applying the polymer coating to the blade material—using a coating roller—has proved somewhat problematic, particularly in forming a coating of a relatively uniform thickness without undesirable voids.

[0006] As such, there remains a need for alternative methods of coating a tape measure blade. While it is not required, it is preferred that the alternative methods address one or more of the problems discussed above.

SUMMARY OF THE INVENTION

[0007] The present invention is directed to a coated tape measure blade and a novel method of making the same. In one embodiment of the invention, a metallic tape blade is substantially coated with a powder and then passed through an induction unit to heat the powder and form a coating on the blade, with the blade having a concavo-convex cross-section when passing through the induction unit. In another embodiment, the metallic tape blade is substantially covered with a powder consisting essentially of nylon having a particle size of 10-20 microns or less and then passed through an induction unit to heat the blade and form a nylon coating derived from the powder thereon. In yet another embodiment, a nylon coating is applied to the metallic tape blade, with the coating having a thickness of not more than about 0.001 inches or less per side and an abrasion resistance according to ASTM D968-81 of at least 30 liters, and more preferably at least 40 liters, of sand. In still other embodiments, one or more of these aspects are combined to form a tape blade having a protective coating thereon.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] **FIG. 1** shows a power return tape measure that may employ a tape blade constructed in accordance with the present invention.

[0009] **FIG. 2** is a perspective view of a concavo-convex tape blade.

[0010] **FIG. 3** is a cross-sectional view of the tape blade of **FIG. 2**.

[0011] **FIG. 4** shows a process line for forming a coating on the tape blade of **FIG. 2**.

[0012] **FIG. 5A** shows a top view of a coil having a non-circular shape suitable for the induction unit of the process line of **FIG. 4**.

[0013] **FIG. 5B** shows a side view the coil of **FIG. 5A**.

DETAILED DESCRIPTION OF THE INVENTION

[0014] As the present invention relates to a coated tape measure blade, particularly for so-called power return tape measures, a brief discussion of such devices may be helpful in understanding the present invention. As illustrated in **FIG. 1**, a power return tape measure, generally designated **10**, typically includes a coilable measuring tape or blade **12** and an associated housing **20**. The distal end of the tape **12** may include an end hook **14** to prevent it from being retracted into the housing **20**. A tape-biasing device (not shown), such as a spring, is operatively connected to the tape **12** to bias it towards a retracted orientation. A locking mechanism, including a toggle **16** or similar actuator is provided to aid in controlling the movement of the tape **12** into and out of the housing **20**. One or both sides of the housing **20** may include a clip **18**, as desired. The housing **20** may include a main case or shell **22** and a grip element **24** mounted on the shell **22**. Shell **22** is preferably made from a durable material such as a hardened plastic (e.g., ABS, polycarbonate, or the like) and may be constructed from two portions joined together by suitable screws **26**, as is known in the art. The housing **20** is preferably sized to fit within a user's hand, and also conveniently stored on a work belt or in a toolbox. As the present invention primarily relates to the tape blade **12**, additional details of the construction of the tape measure **10** are not necessary for one of ordinary skill in the art to understand the present invention. If additional details are desired, see U.S. Pat. Nos. 4,527,334; 4,976,048; 6,349,482, and U.S. patent application Ser. No. 10/174,629, filed Jun. 19, 2002, which are incorporated herein by reference.

[0015] The tape blade **12** is typically formed from a relatively thin metal ribbon **32** shaped to form the desired concavo-convex cross-sectional shape (as shown in FIGS. **2-3**) when extended from the housing **20**, and the desired flat cross-section when coiled inside the housing **20**. The underlying metal ribbon **32** is typically a steel alloy, such as medium to high carbon steel (e.g., 1095 steel or 1050 steel), with a thickness in the general range of 0.004 to 0.0055 inches. While not required, the ribbon **32** forming the core

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