METHOD OF MAKING CONCAVO-CONVEX TAPE MEASURES

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Fig. 1

Fig. 2

Fig. 3

Fig. 4

Fig. 5

Fig. 6

Fig. 7

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METHOD OF MAKING CONCAVO-CONVEX TAPE MEASURES


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1 Claim. (Cl. 33—137)

This invention relates to the manufacture of tape measures and pertains more particularly to a process or method of making measuring tapes of known concavo-convex cross sectional shape.

Such a tape when drawn out from its case possesses sufficient stiffness to serve as a straight extensible measuring rule.

The term "tape measure" will be used to define a piece of concavo-convex tape of appropriate length, width, thickness and curvature, to be rod-like or self-sustaining when extended, for use under ordinary conditions, for example, the taking of measurements in vertical, inclined or horizontal directions. Such units are usually made four feet to eight feet long.

The claimed subject matter relates to a novel method of manufacturing such units.

An object of our invention, broadly considered, is to provide a simple method for converting flat flexible ribbon metal, steel for example, into concavo-convex tape units that are characterized by being metal sheathed on their convex backs and marked by etching on their concave faces.

It may be noted that in the completed tapes produced by our new method the metal sheathing on the back is employed because it presents a convex surface that is wear resisting and runs smoothly in and out from its tape case without appreciable friction and presents a polished glossy attractive appearance. The etched concave face is employed because it produces a background of dead black, leaving numerals and graduation marks of the original bright metal of the ribbon standing out in bold contrast against the black background, although alternately, it may have the marks in black against a background of the ribbon metal in its natural finish.

It is also an object of the invention to improve the accuracy and clearness of the graduated markings by applying them to a strip of ribbon metal in the flat, thereby avoiding the inconvenience of creating such markings after the tape has been bent to its concavo-convex shape, as distinguished from methods heretofore employed.

Another object is to increase the speed and facility of manufacturing flexible tapes of concavo-convex cross sectional shape while decreasing the cost of quantity production by reducing the number of manipulations and process steps heretofore required, yet producing a superior article.

A further object is to avoid waste caused by longitudinal splitting of the ribbon while feeding it lengthwise between forming rolls. Hereafter there has been considerable loss of partly fabricated material on account of a crack starting in the tape at the rolls and running through to a considerable length of the supply of ribbon metal before being detected.

Our method comprises manufacturing steps each of which, considered by itself, has been known in the making of tape measures that are flat and etched on both sides. However, such steps carried out as herein described and substantially in the order given together constitute a novel and useful method by which the advantageous results herein set forth are obtained.

The steps of our process are serially illustrated in the accompanying drawing in which:

Fig. 1 is a view of a strip of flat ribbon metal stock.

Fig. 2 is a fragmentary perspective view of a stock strip painted on one face with paint that prevents plating metal from adhering.

Fig. 3 shows the piece illustrated in Fig. 2 after plating the back, the paint having been removed from the face.

Fig. 4 shows the tape of Fig. 3 with markings formed on the unplated face by painting with acid proof ink.

Fig. 5 shows the piece illustrated in Fig. 4 after having been etched and the ink removed.

Fig. 6 is a diagrammatic view showing the manner of rolling the strip to concavo-convex form.

Fig. 7 is a perspective view of a completed piece of tape.

This process is distinguished from earlier practice by the fact that among other things, the step of plating the back of the tape is arranged in a new relation to the other steps, whereby the electroplated metal is utilized as an acid resisting protective covering for the strip of ribbon metal while its front face is being etched.

Cost of manufacture is thereby reduced because the necessity is avoided of first painting the back of the ribbon and printing the front, then etching the front, unmasking the back by washing and finally painting the front, all of which, according to earlier methods would have to be done before the back could be electroplated. Our invention is further differentiated in that, contrary to established practice and belief, we have demonstrated that flat ribbon metal can be rolled to concavo-convex shape most satisfactorily after its back has been plated, and a stronger, more rigid and more satisfactory tape is thereby produced.

For both of the reasons just mentioned manu-
Facturing labor is saved over prior methods of making concavo-convex tapes.

In carrying out our claimed method we take flat flexible ribbon metal stock and having first covered the front face of the ribbon with a coat of non-corrodible paint, we deposit, preferably by electroplating, on the back of the ribbon an integral sheathing of a metal such as nickel or chromium. After the back has been plated and the front has been washed clean of the coat of paint, the desired markings and background are applied to the front of the flat ribbon. This is done in known manner by printing with non-corrodible ink on the unplated face of the tape, then etching the un-inked surface in the usual manner and finally washing off the masking ink. If the graduation lines and figures themselves are printed in ink the subsequent etching operation will produce light figures against an etched dark background. If the background is printed leaving the areas of the markings exposed, the result will be dark markings against the light metal background of the original ribbon. At this stage the ribbon is still in the flat but now carries on its front face the desired markings and the back is covered by a sheathing of metal. It is next cleaned and its etched face is coated with lacquer.

In the final step of the process, which is bending the plated, etched and lacquered flat strip into concavo-convex cross-sectional shape, a step is employed to prevent loss of material caused by splitting or cracking the ribbon lengthwise as it passes between the usual power driven forming rolls that bend it into concavo-convex cross-sectional shape. The innate toughness and flexibility of the sheathing apparently tends to prevent such splits and cracks from starting during the rolling process, thereby reducing wastage on account of spoiled material. Furthermore, the chance of spoiling any considerable length of tape by splitting is eliminated by severing the unit lengths from the ribbon while it is in the flat, and putting the units through the rolls individually, so that if a crack starts it will not spoil more than one unit length, say, from four to eight feet.

Having thus described our invention, what we claim and desire to secure by Letters Patent is:

The herein described method of making a concavo-convex measuring tape which consists in depositing on one face only of a flat flexible metallic ribbon, a coating of metal that is not affected by etching fluid, next etching on the opposite face of the ribbon appropriate graduated markings and finally shaping the ribbon to concavo-convex cross-sectional form with the said metallic coating constituting the convex face.

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