March 3, 1953 G. D. ATWOOD 2,630,394

METHOD OF MAKING A PIRN

Filed Jan. 27, 1945

Fig. 1.

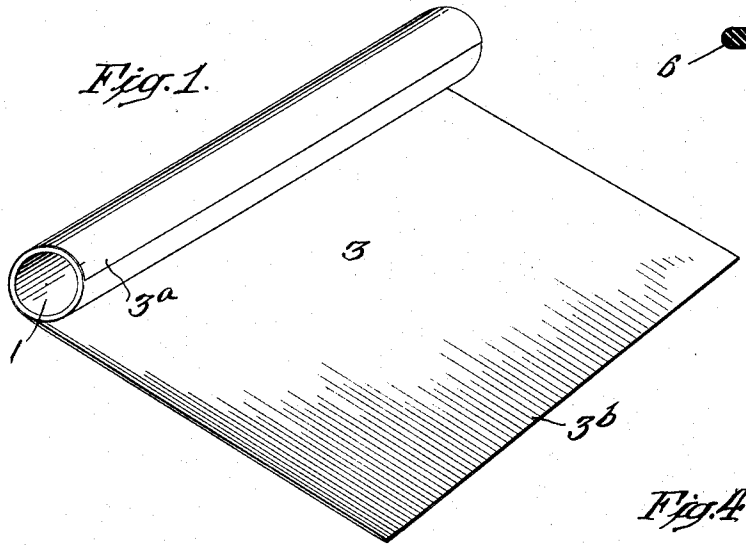


Fig. 2.

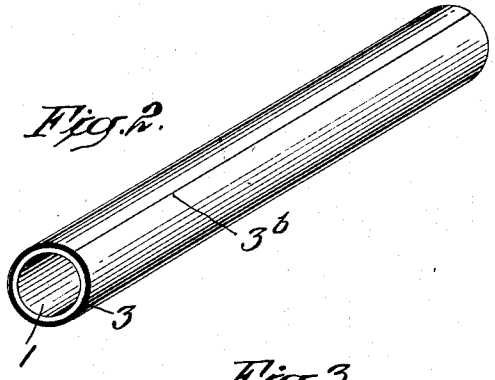


Fig. 3.

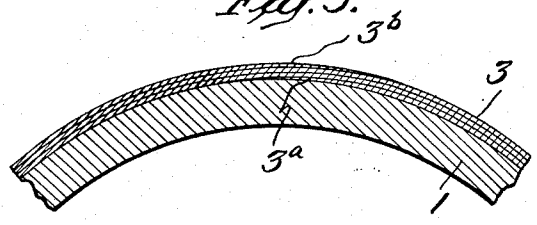
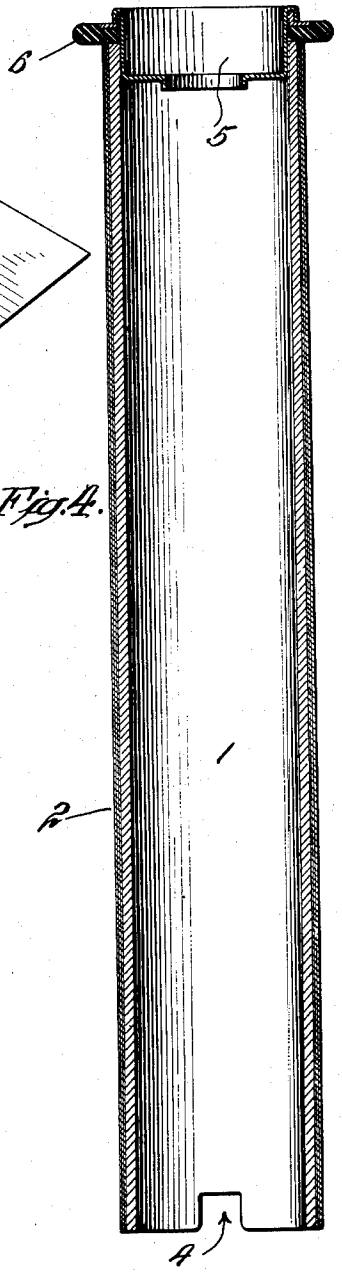


Fig. 4.



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METHOD OF MAKING A PIRN

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Application January 27, 1945, Serial No. 574,919

2 Claims. (Cl. 154—83)

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This invention relates to improvements in textile spools and more particularly to pirns.

The general object of the invention is to provide a spool having improved characteristics as to weight, strength, dynamic balance and surface texture.

A further object of the invention is to provide an inexpensive and simple method of manufacturing such spools.

With these general objects and still other objects which will appear in the following full description in mind, the invention consists in the combinations and arrangements of parts, details of construction and methods of manufacture which will now first be fully described in connection with the accompanying drawing, and then be more particularly pointed out in the appended claims.

In the drawing:

Figure 1 is a perspective view showing the way in which a surfacing sheet is applied to a barrel member;

Figure 2 is a view showing the barrel member of Figure 1 with the surfacing applied;

Figure 3 is a fragmentary view in cross section of the article of Figure 2 and on a very much enlarged scale; and

Figure 4 is a central longitudinal section of a completed pirn, on an intermediate scale of enlargement.

A typical conventional pirn is constructed of solid wood, such as maple, formed by turning operations to the desired outer contour and provided with a central bore for fitting on a spindle. Such pirns have the disadvantage of high cost and excessive weight and they are also subject to damage which impairs or destroys their utility. Later proposals involve the use of composite structures of metal and pasteboard or the like. In such structures it has been found necessary as a practical matter to utilize an outer pasteboard tube as a barrel member together with suitable expansible reinforcement structure therein, for the reason that it has not been possible to apply a coating of pasteboard or similar material to a barrel and obtain the necessary concentricity and dynamic balance. Such concentricity and dynamic balance are of the highest importance, as lack of concentricity and balance produce objectionable vibration with consequent wear on the spindle bearings, which again aggravates the vibration. These conditions are most serious when handling very fine synthetic fibers such as nylon or glass fibers.

In my previous application, Serial No. 530,826

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filed April 13, 1944, for Pirn, now abandoned, I have disclosed a pirn consisting basically of a single metal tube together with a bearing adapter for mounting the lower end of the same upon a whorl and engaging the spindle. The pirn of the present invention is similar to that in my said application in that the barrel comprises a unitary tubular metal member 1 which is a seamless drawn tube made of aluminum, Duraluminum, steel or other material having the necessary characteristics of strength. Such a metal barrel in itself, however, possesses the disadvantage that if it is marred in any way, there may be created sharp irregularities which will catch and damage the fiber, and accordingly the pirn of the present invention is provided with a surface 2 of paper or similar material which is sufficiently soft so that damage to the yarn will be prevented. Since it is not practical to unreel fiber from a pirn where the fiber is unsatisfactory, such fiber is removed by slicing through it, more or less parallel to the pirn axis, necessarily cutting or scoring the pirn surface to some extent. Where this surface is of metal, its utility will thereby be destroyed but a paper or similar surface will merely be slightly indented or grooved, without suffering significant damage. It has not been found possible hitherto to provide an entirely suitable paper or pasteboard surfacing for a pirn barrel. Such surfacings have been provided in the form of a pasteboard or similar tube which is slid over the barrel and collapses against the same under pressure of the yarn when wound thereon and it has also been proposed to form a surfacing by compressing felted material, such as a blanket of paper stock, upon the barrel with a suitable adhesive or bonding agent. Neither of these procedures will produce a truly uniform and concentric barrel surface. As will be apparent, if the outer surface is not concentric with the inner barrel either the inner barrel or the yarn package being wound thereon will be eccentric and the tendency of the pirn to vibrate will thereby be increased. I have found, however, that by wrapping a previously formed and compacted sheet of paper or similar material upon the barrel in wet condition, and thereafter drying the same, a smooth, uniform and concentric surfacing may be produced. As shown in the drawing, the pirn barrel member or body 1 is provided with a suitable surface by merely wrapping a rectangular sheet of paper, 3, thereon. The paper may be kraft or other suitable paper and may be a few thousandths of an inch in thickness and of length sufficient to wrap the barrel two or three times,

the ends are preferably tapered off and the width is of such length as to bring the outer tapered end 3–*b* over the inner tapered end 3–*a* when the paper has been wrapped on the barrel, as indicated in Figure 3.

Prior to wrapping, the paper is soaked in adhesive such, for example, as rice paste and will therefore shrink as it dries. The result of such shrinkage is to build up relatively great tension in the paper, thus compressing the paper wrapping firmly and smoothly layer upon layer and upon the barrel. Normally there will be little or no slippage of one layer over another during the drying and setting process and since a plurality of layers are utilized it is immaterial whether the paper grips the barrel surface with sufficient force to prevent slippage when the shrinking commences. The paper may be wrapped with a slight overlap at one or both ends of the metal tube, which overlap is thereafter trimmed off to make the wrapping flush with the barrel end, where necessary.

The pirn is completed by cutting slots 4 through the metal and paper coating thereon to form means for engaging the lugs of the whorl. The upper end is provided with a suitable bearing member such as the member 5 for engaging the spindle end and with a washer 6 to provide a bearing surface for the fiber being wound, if desired.

What is claimed is:

1. The method of manufacturing pirn barrels which comprises wrapping a sheet of paper soaked with adhesive upon a metal barrel body to form a plurality of layers thereon and thereafter drying the said sheet to form a smooth and tensioned surface coating upon the barrel.

2. The method according to claim 1, in which the ends of said sheet are tapered and the sheet is of such length as to bring the said tapered ends in overlying relation when wound upon the barrel.

GEORGE D. ATWOOD.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
554,631	Fuller et al.	Feb. 11, 1896
1,090,399	Kuttner	Mar. 17, 1914
1,704,174	Clarke	Mar. 5, 1929
1,876,094	Taylor	Sept. 6, 1932
1,927,985	Leahey	Sept. 26, 1933
2,133,137	Hackett	Oct. 11, 1938
2,279,630	McMahon	Apr. 14, 1942
2,359,604	Atwood	Oct. 3, 1944