May 20, 1924. 1,494,440

H. PARKER

REENFORCING END FOR FIBER CORES

Filed Aug. 16, 1923 2 Sheets-Sheet 1

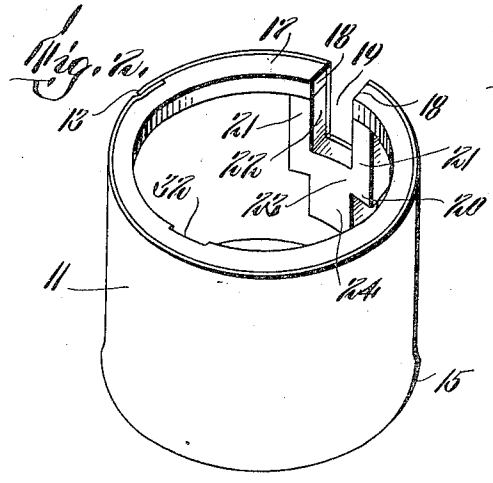


Fig. 2.

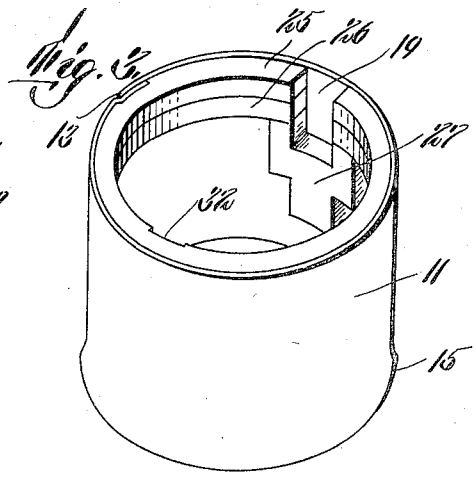


Fig. 3.

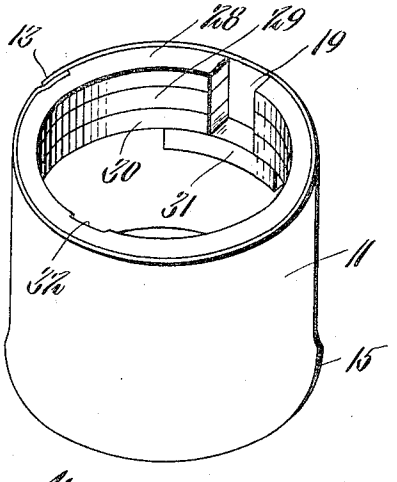


Fig. 4.

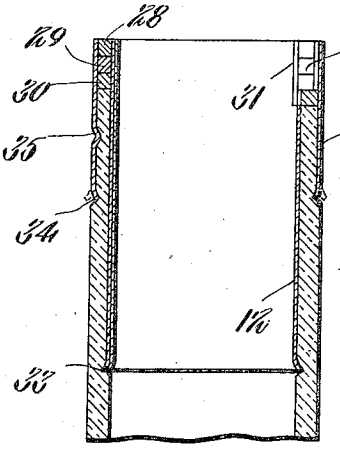


Fig. 1.

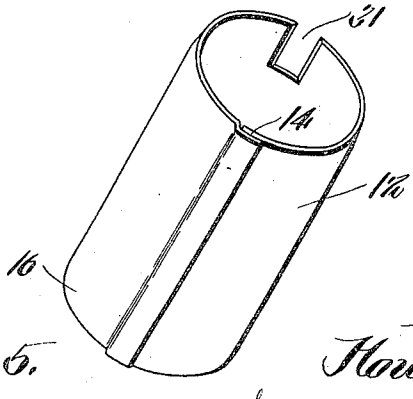


Fig. 5.

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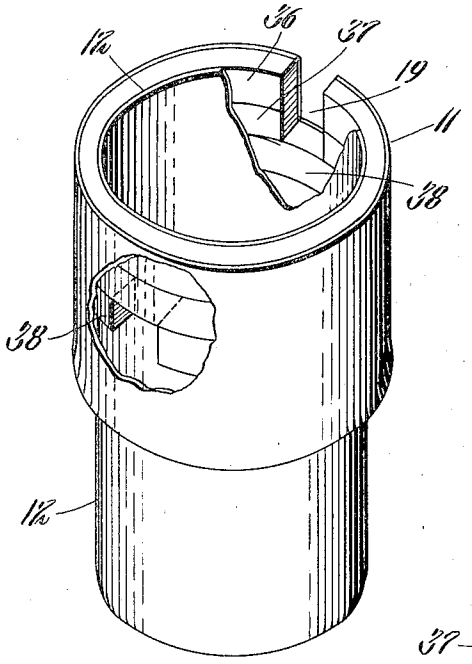


Fig. 6.

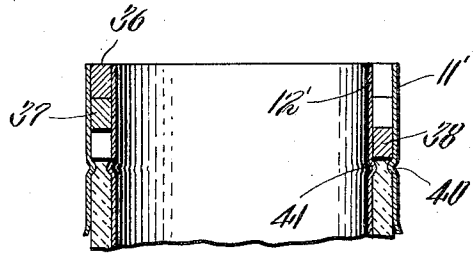


Fig. 7.

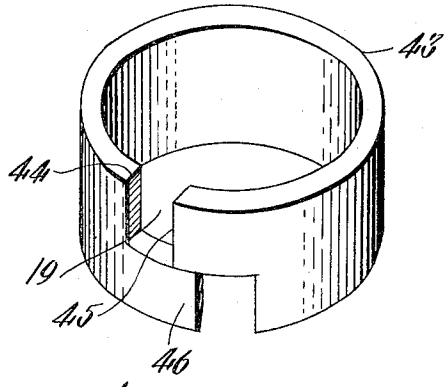


Fig. 8.

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Patented May 20, 1924. 1,494,440

UNITED STATES PATENT OFFICE.

HOWARD PARKER, OF BERLIN, NEW HAMPSHIRE, ASSIGNOR TO BROWN COMPANY, OF BERLIN, NEW HAMPSHIRE, A CORPORATION OF MAINE.

REENFORCING END FOR FIBER CORES.

Application filed August 16, 1923. Serial No. 657,804.

To all whom it may concern:

Be it known that I, HOWARD PARKER, a citizen of the United States, residing at Berlin, in the county of Coos and State of New Hampshire, have invented new and useful Improvements in Reenforcing Ends for Fiber Cores, of which the following is a specification.

This invention relates to tubular cores on which paper may be wound in a roll, and more particularly to those cores, the body of which consists of a fibrous tube produced by winding paper or wet paper pulp upon a mandrel.

The object of the invention is to provide a metal end or reenforcing member for such cores to impart strength thereto at the points of greatest strain or stress.

Referring to the drawing,—

Figure 1 represents a longitudinal section through one end of a core embodying the present invention.

Figure 2 represents an end member in process of construction, the inner sleeve being omitted.

Figure 3 represents another form of end member, of which the inner sleeve is omitted.

Figure 4 represents still another form of member embodying the invention.

Figure 5 represents the outer sleeve which is employed in the finished form of the end members shown in Figures 2, 3 and 4.

Figure 6 shows another embodiment of the invention in which the bridge member is clamped by the split ring members against an internal head formed in one or the other (or both) of the sleeve members.

Figure 7 represents a section through the same after the split rings and metal sleeves are assembled and before the welding and finishing operations are performed.

Figure 8 illustrates another form of split ring which may be used.

The reenforcing end member of the tube is necessarily provided with a driving notch or seat to receive the pin or key of the driving element by which the core is driven, and it is important that this seat should be so reinforced that it is capable of withstanding the stresses of the driving member and the wear of the pin or key. Likewise the metallic end member should be secured to the fiber core in such wise as to prevent any rotative or angular dislocation one relatively to the other.

In addition to providing a core having these desirable or necessary characteristics, it is the especial object of my invention to provide an end member which is relatively light, inexpensive and of great strength and durability.

Referring to the drawing, 10 indicates a fiber core, of which only a portion is shown, but it will be understood that this is of any desired length and diameter and that it is provided with an end member at each extremity.

In general, the end member consists of three elements, namely an outer sleeve, an inner sleeve, and an intervening annular metallic member which may be formed in several parts. The outer sleeve 11 and the inner sleeve 12 are each formed of a flat blank of relatively thin sheet metal, e. g. sheet iron or sheet steel, bent into cylindrical form with its longitudinal edges overlapped. It is desirable that the outer surface of sleeve 11 and the inner surface of sleeve 12 should be unbroken cylindrically, and consequently one edge 13 of sleeve 11 is inset, whereas the corresponding edge 14 of sleeve 12 is outset, in each case, the thickness of the overlapping other edge of the sleeve. The overlapping edges of each of the two sleeves are electrically automatically welded, either by spot welding or line welding as may be desired.

The diameters of the two sleeves are such that they will receive, with a driving or friction fit, the end of the fiber core, and the core is internally and externally grooved to receive the inset or outset overlapping edges of the sleeves. To assist in placing the end members, when completed, on the core, the inner end (as it might be termed) of the sleeve 11 is slightly flared as at 15, and the inner end of sleeve 12 is slightly contracted as at 16. Preferably the inner sleeve is at least double the length of the outer sleeve, to assist in preventing the dislocation of the core end.

Between the outer ends of the two sleeves, I place the intermediate annular member which comprises one or more split rings which are of a thickness approximately a little less than that of the fiber core, and which receive the thrust of the driving key or pin. Each ring is substantially circular, but its ends are separated a distance sufficient to form a driving seat or notch of the

desired width. In Figures 2, 3 and 4, I have shown the end members as being respectively provided with one, two or three of such rings.

In Figure 2, a split ring is indicated at 17, and its end faces 18, 18, form the side walls of the seat or notch 19. In this case, I complete the seat by a bridge member 20, having parallel arms 21, the inner faces 22 of which are flush with the faces 18, the cross bar 23 and an extension 24. In Figure 3 there are two rings 25, 26, and a bridge member 27, of the same general form as that at 20 but with shorter arms. In Figure 4 there are three rings 28, 29, 30, the end faces of which form the sides of the seat or recess 19, and a bridge member 31 which is in effect the same as the cross bar of the member 23 in Figure 2. These various members are all autogenously welded together and are then assembled with the outer and inner sleeves so that the outer ends of the sleeves are flush with the exposed outer face of the ring member. The inner sleeve is formed with a notch 31 registering with the notch or seat formed by the ring or rings and the bridge member. The rings are grooved as at 32, 32 to receive the overlying lapped edge 14 of the inner sleeve.

The end of the fiber core is notched to receive the bridge member, and it is driven or crowded into the metal end until it bears against the intervening member thereof as shown in Figure 1. Then, by suitable tool or appliance, the rear end of each sleeve is more or less forced into or embedded in the fiber core, as indicated at 33, 34, so that the wall of the core is clamped between the sleeves and the metal end member as a whole and is securely locked in place. The bridge members may be drop forged or may be stamped from heavy sheet metal, and the rings may be formed from drawn bars of appropriate shape in cross section.

When the metal end is formed of its several elements, it is to all intents and purposes an integral or unitary structure, in view of the electric welding together of the several elements. It is not necessary, where several rings are employed, to weld them directly one to the other, since their being welded to the sleeves is sufficient to connect them one to the other.

The sheet metal sleeves are very thin, so that, when the end of the core is inserted, it is compressed sufficiently so that the cylindrical surface of the body of the core is flush with or has substantially the same external diameter of the outer sleeve. Thus ordinarily it is unnecessary to reduce the diameter of the ends of the core by a cutting or abrading operation. It is evident that, if desired, the outer sleeve may be notched to register with the seat in the intermediate member and the notch in the inner sleeve, as shown in Figure 2. Also, if desired, indentations may be made in the outer sleeve as at 35, to force a protuberance into the body of the fiber core to assist in securing the metal end on the core.

The end member, as thus disclosed,—comprising the inner and outer sheet-metal sleeves and the intermediate member, which is so formed as to provide a notch or seat for the core-driving pin or key,—forms an annular socket into which the end of the core may be inserted or driven. Said intermediate member, in this aspect of the case, consists of one or more split rings with the ends spaced apart, and a bridge member which if welded to the ring or rings bridges and forms the end wall of the recess or key seat, and prevents the rings from being expanded or contracted when the core is being driven. Said intermediate member thus considered as a whole is annular and is formed or provided with the notch or key seat. By forming the sleeves of thin sheet metal, it is unnecessary to greatly reduce and thus weaken the wall of the core, as would be the case were the core end member formed of a casting, while at the same time I secure increased strength and decreased weight. While for many reasons it is advantageous to form the sleeves from blanks of flat sheet metal bent into cylindrical form and having the overlapping edges welded or otherwise secured together, I should not regard it as a departure from the spirit and scope of the invention if each sleeve were formed from thin drawn seamless metal tubes which for this purpose may be regarded as thin sheet metal in contradistinction to cast metal.

In Figs. 6 and 7 I have shown a "metal end" or reenforcing end, in which the inner and outer sleeves are formed of seamless drawn metal, although for purposes of economy and convenience it is preferable to form them of flat sheet metal blanks bent into cylindrical form as hereinbefore described. I have also shown that the bridge of the intermediate member may be in the form of a split ring, so that the parts which form said intermediate member may all be alike, and thereby simplify the manufacturing operations. In this instance I may employ three rings 36, 37, 38, although the two rings 36 and 37 could be made in one piece if desirable. But as illustrated, however, they are all the same size but with the ring 38 so arranged as to bridge the end of the notch 19 formed by the spaced ends of the rings 36, 37. The spaced ends of ring 38 may be approximately diametrically opposite the notch 19. Either or both of the sleeves is formed with means cooperating with the rings 36, 37, for clamping the ring 38 between them. Such means

may consist of abutments, such for example as beads 40, 41, formed in the sleeves 11', 12',—internally on the former and externally on the latter. Of course either bead or abutment could be omitted, and in practice I omit it from the sleeve 11. In assembling the parts, the three rings are slipped on the inner sleeve 12, so that the notch provided by the spaced end faces of the rings 36, 37 registers with the recess (such as that at 31 in Fig. 5) and with the body of the ring 38 bridging the notch. The parts thus far assembled are telescoped into sleeve 11, and by a power press or other suitable instrumentality are forced thereinto until the ring 38 bears firmly against the bead 40. This operation has the effect of peening the edges of the sleeves, whereby the parts are all firmly clamped together. By an electric welding machine the rings 36 and 37 (and 38, if desired) are welded to the two sleeves. Only the ends of the rings 36, 37 need be welded to the sleeves. In any event, the bridge ring 38 is firmly clamped against the bead or beads of the sleeves but of course it, too, may be welded in place as desired. Then by a grinding machine or other instrumentality the peened ends of the sleeves are removed, leaving the exposed face of ring 36 and the ends of the sleeves flush. In this construction, when the inner sleeve is formed with a bead or other equivalent stop or abutment, it serves accurately to locate the intermediate member in reference to the finished ends of the sleeves. When the "reenforcing end" is completed, it is placed on the extremity of the core and there secured as herein previously described.

The bridge member need not be formed separately from the split ring. In fact, a single split ring 43, such as shown in Fig. 8, may be employed, so cut from a bar that when bent into circular form its opposing end faces 44, 45, form the notch, or seat, which is bridged by the projection 46 on one of its ends. This ring may be secured in place between the sleeves and its overlapping end portions welded to said sleeves.

The generic invention or improvements hereinbefore set forth have previously been described in my application Serial No. 618,852, filed February 13, 1923, of which the present application is in part a continuation.

What I claim is:—

1. A reenforcing end for fiber cores, comprising an inner sleeve and a separately formed outer sleeve of thin sheet metal, and a separately formed intermediate metallic member located within and between the outer ends of the sleeves and secured thereto, the intermediate member being formed to provide a notch or seat, and said sleeves and intermediate member forming an annular socket to receive the end of the core.

2. A reenforcing end for fiber cores, comprising an inner sleeve and an outer sleeve of thin sheet metal, and an intermediate metallic member located within and between the outer ends of the sleeves and secured thereto, said intermediate member comprising a split ring having spaced ends to constitute a seat or recess and a bridge forming the end of said seat.

3. A reenforcing end for fiber cores, comprising an inner sleeve and an outer sleeve of thin sheet metal, each sleeve having longitudinal lapped welded edges and an annular metallic member located between the outer ends of said sleeves and secured thereto, forming with said sleeves an annular socket to receive the core end, the said annular member comprising a split ring with spaced ends forming a driving notch or seat.

4. A reenforcing end for fiber cores, comprising an inner sleeve and an outer sleeve of thin sheet metal, each sleeve having longitudinal lapped welded edges and an annular metallic member located between the outer ends of said sleeves and secured thereto, forming with said sleeves an annular socket to receive the core end, the said annular member being formed with a driving notch or seat and said inner sleeve being at least twice the length of the outer sleeve.

5. A reenforcing end for fiber cores, comprising an inner sleeve and an outer sleeve of thin sheet metal bent into cylindrical form with longitudinal edges so overlapped that the inner sleeve has an unbroken inner cylindrical surface and the outer sleeve an unbroken outer cylindrical surface, and a separately formed intermediate notched metal annular member located within and secured to the outer ends of said sleeves, to form with said sleeves an annular socket to receive the end of the core.

6. A reenforcing end for fiber cores, comprising an inner sleeve and an outer sleeve of thin sheet metal, and an intermediate metallic member located within and between the outer ends of the sleeves and secured thereto, the intermediate member being formed to provide a notch or seat, and said sleeves and intermediate member forming an annular socket to receive the end of the core, the inner ends of said sleeves being impressed or embedded into the core.

7. A reenforcing end for fiber cores, comprising an inner sleeve and an outer sleeve of thin sheet metal, and an intermediate metallic member located within and between the outer ends of the sleeves and secured thereto, and an annular intermediate member located within and secured to the outer ends of said sleeves, said intermediate member comprising a plurality of split rings

with their ends spaced to form a key seat or notch, and a bridge member bridging the end of said key seat or notch.

8. A reenforcing end for fiber cores comprising an inner sleeve, a separately formed outer sleeve, and a separately formed intermediate member secured thereto, said member comprising a split ring whose spaced end faces form a notch or keyseat, and a bridge member bridging the end of said keyseat or notch.

9. A reenforcing end for fiber cores comprising an inner sleeve, a separately formed outer sleeve, and a separately formed intermediate member secured thereto, said member comprising one or more split rings having spaced end faces, forming a keyseat or notch, and a split ring arranged with its body portion bridging the end of said notch.

10. A reenforcing end for fiber cores comprising an inner sleeve, a separately formed outer sleeve, and a separately formed intermediate member secured thereto, said member comprising a split ring whose spaced end faces form a notch or keyseat, and a bridge member bridging the end of said keyseat or notch, the end portions of said split ring being welded to said sleeves.

11. A reenforcing end for fiber cores comprising an inner sleeve, a separately formed outer sleeve, and a separately formed intermediate member secured thereto, said member comprising a split ring whose spaced end faces form a notch or keyseat, and a bridge member bridging the end of said keyseat or notch, one of said sleeves being formed with an abutment engaged by said bridge member.

12. A reenforcing end for fiber cores comprising an inner sleeve, a separately formed outer sleeve, and a separately formed intermediate member secured thereto, said member comprising a split ring whose spaced end faces form a notch or keyseat, a bridge member bridging the end of said keyseat or notch, and a bead formed on the inner sleeve against which said bridge member is clamped by said split ring.

In testimony whereof I have affixed my signature.

HOWARD PARKER.