May 5, 1931. P. O. UNGER 1,804,134

METHOD OF MANUFACTURING FLEXIBLE POSTS

Filed Dec. 27, 1927

Fig. 1.

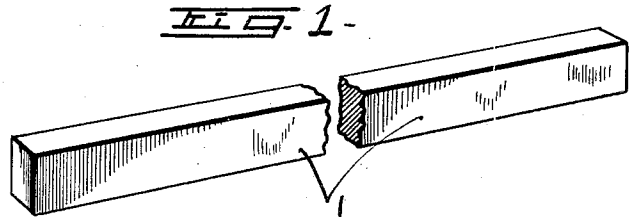


Fig. 2.

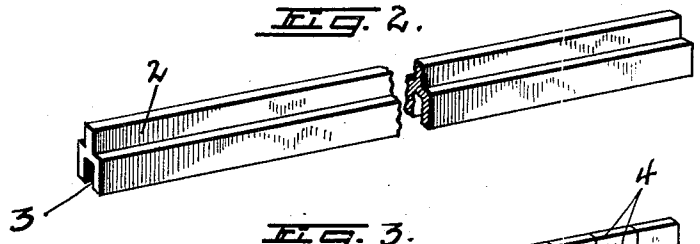


Fig. 3.

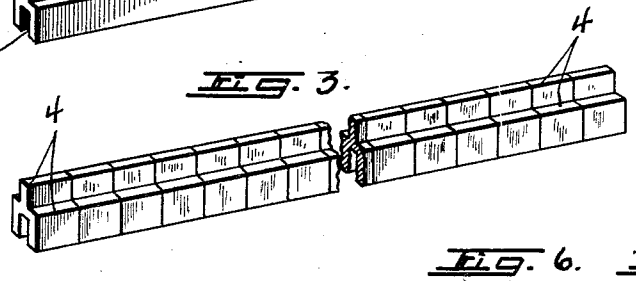


Fig. 4.

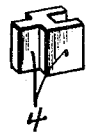


Fig. 5.

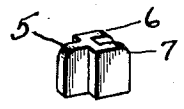


Fig. 6.

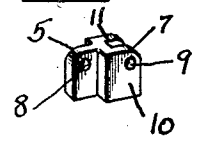


Fig. 7.

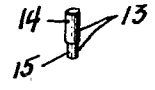


Fig. 8

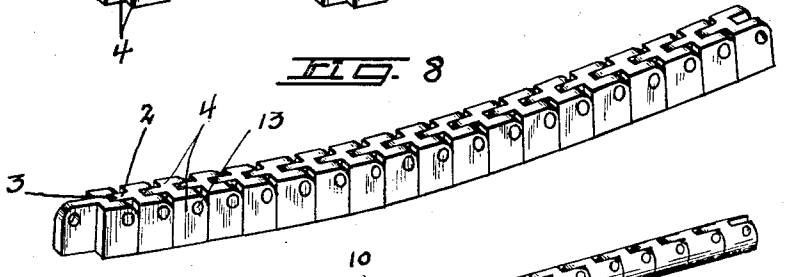


Fig. 9.

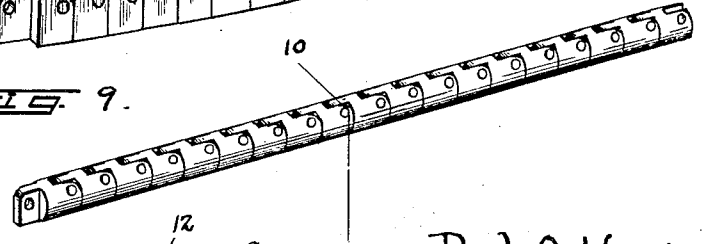
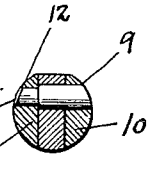


Fig. 10.



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Patented May 5, 1931 1,804,134

UNITED STATES PATENT OFFICE

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METHOD OF MANUFACTURING FLEXIBLE POSTS

Application filed December 27, 1927. Serial No. 242,742.

This invention relates to a new and improved method of manufacturing flexible posts with particular reference to flexible posts which are used in loose leaf binders.

Flexible posts for use in binders to which loose leaves may be added and from which loose leaves may be taken if desired are preferably cylindrical in shape, and should present a smooth and uniform surface throughout their lengths in order that the individual leaves may not become caught between the links and may be moved freely along the posts.

Heretofore such flexible posts have been manufactured by working to completion the individual links and then joining them together in a continuous post by means of rivets. In this method of manufacture it is very difficult, if not impossible, to produce a post which does not present rough spots and uneven surfaces throughout its length.

The main object of my invention is to provide a method whereby flexible posts may be manufactured in a way which will insure that the finished post is smooth and uniform throughout its length and that each post manufactured by this method will be a facsimile of other posts manufactured by this method.

Other objects and advantages relate to the size, shape arrangements of parts and the different operations performed to produce the finished article, all as will more fully appear from the following description taken in connection with the accompanying drawings in which:—

Figure 1 is a perspective view partially broken away of the raw stock from which the article is made.

Figure 2 is a perspective view partially broken away showing the raw stock after the first manufacturing operation has been performed.

Figure 3 is a perspective view partially broken away of the structure shown in Figure 2 after the second manufacturing operation has been performed.

Figure 4 is a perspective view of an individual link made by the second manufacturing operation.

Figure 5 is a perspective view of a link after the third manufacturing operation has been performed.

Figure 6 is a perspective view of a link after the fourth manufacturing operation has been performed.

Figure 7 is a perspective view of a pintle used in assembling the structure.

Figure 8 is a perspective view of a series of links assembled by means of pintle shown in Figure 7.

Figure 9 is a perspective view of my finished flexible post.

Figure 10 is a section on line —10—10— of Figure 9.

The raw stock —1— from which my device is constructed consists of a strip of steel or other appropriate material rectangular in cross section. I first form this raw stock —1— to produce a tongue —2— along one of the narrower longitudinal edges and a corresponding groove —3— along the opposite longitudinal edge, the width and height of the tongue —2— being the same or slightly less than the width and depth of the groove —3— so that the tongue —2— will fit into the groove —3— in a manner hereinafter to be described.

I then divide the bar —1— transversely as shown in Figure 3 to obtain a plurality of links —4— which are similar in size and shape.

Each link —4— is then subjected to an operation whereby one end of the tongue —2— is rounded off as shown at 5 in Figure 5 and the corresponding ends of the ears —10— and —11— of the groove —3— are rounded off as shown at 7 and 6 in Figure 5. A hole —8— is then formed through tongue —4— adjacent the rounded end —5—. Another hole —9— similar in size to hole —8— is then formed in one of the ears —10— of the groove —3— and is positioned in the same relation to end —7— as hole —8— bears to end —5—. The opposite ear —11— is provided with a hole —12— having the same axis as hole —9— but being slightly smaller in diameter. I

then form a pintle —13— with one end —14— of a size and shape to fit holes —8— and —9— and extend through groove —3— and with the opposite end —15— of a proper size and shape to fit hole —12—.

I then assemble my links —4— in the manner shown in Figure 8 where the tongue —2— of a link fits into the groove —3— of the adjacent link with the rounded ends 5, 6, and 7 in the same plane. I then fasten links —4— to one another by means of pintles —13—, said pintles passing through hole —9— in one ear of groove —3— then through hole —8— in a tongue —2— which is inserted into a groove —3— and thence through hole —12— in the opposite ear —11— of groove —3—,. The reduced ends —15— of pintle —13— are then upset as shown at 16 in Figure 10 to fix the pintles —13— in position.

The use of pintles —13— of this design is advantageous in that when the pintles are in position the large end —14— can not enter hole —12— and it is therefore only necessary to upset the small end —15— in order to fasten the pintle in position.

I then take the assembled series of links —4— as shown in Figure 8 and fashion them by any suitable cutting or grinding tool into a cylindrical form uniform throughout its length as shown in Figure 9.

The ends 5, 6 and 7 are rounded so that one link may be turned upon the adjacent link in turn and the whole post bent as desired. The offsetting of pintle —13— towards the rounded ends 5, 6 and 7 is not necessary but it is desirable because it permits the turning of one link with reference to another at a sharper angle. The ends opposite to the rounded ends 5, 6 and 7 not being rounded and the pintle —13— being offset towards the rounded ends 5, 6 and 7 it is not possible to flex the post in the direction opposite the rounded ends 5, 6 and 7, and this is desirable because in posts of this character when sheets are in position in the binder it is easier to manipulate the binder if the posts can be flexed in only one direction.

The final operation which makes my flexible post into a cylindrical shape being done after the links are assembled in the proper relation and fastened together by the pintles insures that the whole post throughout its length will be of a smooth and uniform cylindrical shape and that no rough spots from any of the upset heads —16— of the pintle —13— in any individual link will be found and the post will be smooth and uniform throughout its length.

It will be understood that different materials may be used in the construction of posts of this character and that the degree to which the ends 5, 6 and 7 are rounded may be varied if desired as may be the exact position of the pintle —13— with relation to the rounded ends 5, 6 and 7 of the individual links. For although I have shown and described a specific structure and method of forming the same as exemplifying an embodiment of my invention, I do not desire to restrict myself to the exact shape and form of arrangement of parts as various changes may be made within the scope of the appended claims.

What I claim is:

1. The method of making flexible posts comprising forming a plurality of tongued and grooved links substantially rectangular in cross section, assembling the links with the tongues and grooves of adjacent links in registration, fastening the links by means of pintles passed through the registering tongues and grooves and altering the shape of the pivotally connected links transversely of the lengths of the tongues and grooves to form a flexible post approximately cylindrical in cross section and uniform throughout its length.

2. The method of making flexible posts comprising forming a tongue and a corresponding groove along opposite longitudinal edges of a bar, dividing said bar transversely of the lengths of the tongue and groove into a plurality of links of similar shape, assembling the links with the tongues and grooves of adjacent links in registration, fastening the links by means of pintles passed through the registered tongues and grooves and altering the shape of the pivotally connected links transversely of the lengths of the tongues and grooves to form a flexible post approximately cylindrical in cross section and uniform throughout its length.

3. The method of making flexible posts comprising forming a plurality of tongued and grooved links substantially rectangular in cross section, assembling the links with the tongues and grooves of adjacent links in registration, providing a plurality of pintles having a portion of one end less in diameter than the remaining portion of the pintle, fastening the links by means of said pintles passed through the registering tongues and grooves, and altering the shape of the pivotally connected links transversely of the lengths of the tongues and grooves to form a flexible post approximately cylindrical in cross section and uniform throughout its length.

4. The method of making flexible posts comprising forming a tongue and a corresponding groove along opposite longitudinal edges of a bar of appropriate material, dividing said bar into a plurality of links of similar shape, assembling the links with the tongues and grooves of adjacent links in registration, providing a plurality of pintles having a portion of one end less in

diameter than the remaining portion of the pintle, fastening the links by means of said pintles passed through the registered tongues and grooves, and altering the shape of the pivotally connected links transversely of the lengths of the tongues and grooves to form a flexible post approximately cylindrical in cross section and uniform throughout its length.

In witness whereof I have hereunto set my hand this twenty first day of December, 1927.

PAUL O. UNGER.