Oct. 8, 1940. C. J. BARRY 2,216,833

METHOD OF FORMING HANDLE BAR AND THE LIKE

Filed Aug. 17, 1938

Fig. 1.

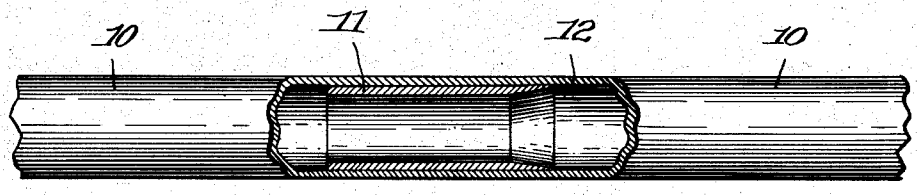


Fig. 2.

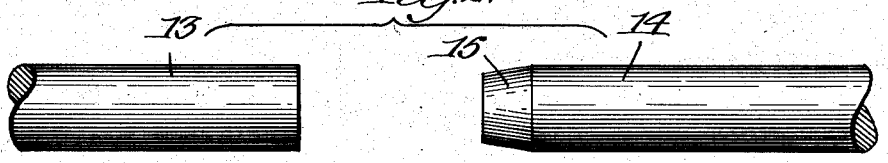


Fig. 3.

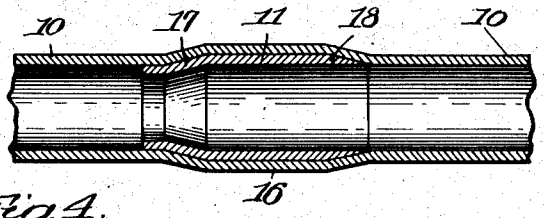


Fig. 4.

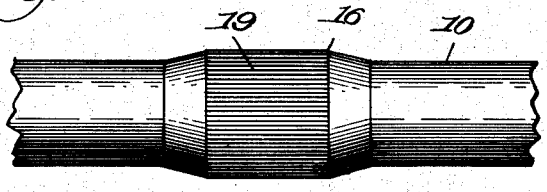
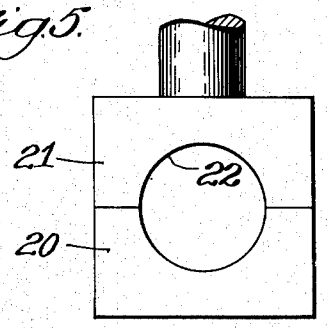


Fig. 5.



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METHOD OF FORMING HANDLE BAR AND THE LIKE

Cornelius J. Barry, Chicago, Ill.

Application August 17, 1938, Serial No. 225,459

2 Claims. (Cl. 29—176)

This invention relates to a handle bar or the like and the method of forming the same, and more particularly the method of forming an enlarged central portion of the tube or bar adapted to be engaged by the clamp of the steering post.

An object of the invention is to provide simple and effective means for forming a tube with an enlarged central portion adapted to be clamped to the steering post of a bicycle, etc. A further object is to provide a tube having a portion thereof expanded, the expanded portion being equipped with a metal reinforcement received within the expanded area. A further object is to provide a simple and inexpensive method whereby a tube having a portion thereof of greater diameter than the remainder and adapted to receive the clamp of a steering post or other device, may be formed very quickly without requiring swaging of the bar, etc. Other objects and advantages will appear as the specification proceeds.

The invention is illustrated, in a preferred embodiment, by the accompanying drawing, in which—

Figure 1 is a plan view of a tube adapted for use as a handle bar or for other uses, the central portion of the tube being broken away and an insert shown therein in section; Fig. 2, a plan view of the adjacent ends of a stop bar and an expander bar employed in expanding the tube; Fig. 3, a sectional view of the central portion of the tube after the same has been expanded; Fig. 4, a broken plan view of the central portion of the tube showing the knurling produced by a die in the expanding operation; and Fig. 5, an end view of a die employed in the forming of the knurling or ribbing of the tube.

Heretofore, it has been the practice to form handle bars generally by two methods. A central enlarged portion of the handle bar is required for receiving the clamp of the steering post. This enlarged portion may be formed by slipping a small section of tubing over the handle bar tubing and braising the same in place. A more recent and popular method has been that of using an oversized bar for the handle bar and then reducing the diameter of the entire bar except for the central portion which forms the enlargement. The first method is very unsatisfactory because of the ugly or unattractive appearance of the enlargement. The second method produces an attractive bar; however, the operation is quite expensive. A special type of metal must be employed because of the effect of the swaging upon the metal, and the swaging operation itself, since it extends over the entire tube except for the small central portion, involves considerable expense.

I have found that an attractive handle can be produced which is substantially identical in appearance with that produced by swaging while at the same time eliminating the special metal cost and the very expensive operation of swaging. At the same time, I use less metal because the tube employed is of small diameter.

In the swaging operation described above, the practice is to employ a one-inch diameter tube and swage all except the middle portion down to a diameter of seven-eighths of an inch. In my process, I start with a seven-eighths inch tube of ordinary suitable handle bar metal, the tube being indicated in the drawing by the numeral 10. I insert into the middle of the tube, or at such point as the enlargement is desired, a metal tube 11. One end of the insert tube 11 is preferably tapered, from the inside outwardly, as indicated by the numeral 12. After inserting the tube to the proper point, I place a solid bar 13 through the tube on the opposite side so as to prevent further movement of the insert 11 in that direction. I then force the expander tool 14, which may be a solid bar provided with a tapered end 15, into the other end of the tube 11. The end of the bar 14 enters the flared end 12 of insert tube 11 and under high pressure, such as, for example, hydraulic pressure, is extended forwardly so as to expand the inner tube outwardly to a point that the diameter thereof is equal to the diameter of the tube 10. This increases the outside diameter of the central portion of the tube to a one inch diameter. Thus, an enlarged portion 16 suitable for being received in the clamp of the steering post, is provided. It will be observed that the insert 11 is locked in reinforced condition within the enlargement 16 because the forward end portion 17 of the insert 11 is left unexpanded while the rear end portion 18, which was formerly tapered, is under the pressure tapered in the opposite direction so as to fit snugly within the incline of the enlargement.

The regular practice is to provide the enlargement 16 with knurling 19. I have found that the knurling can be accomplished in the single operation already described by providing on the outside of the tube adjacent the portion to be enlarged, a pair of dies 20 and 21 providing between them a cylindrical opening 22 equipped with the usual die ribs (not shown). The ribs

in the expanding operation cut into the metal and form the knurling 18.

It will be observed that in the foregoing method, I have accomplished in a single operation, and at very slight expense, a handle bar equipped with an enlargement and in which there is no visible added member, thus producing a product which has heretofore been produced only by the use of an oversized tube, a die operation for knurling and a swaging operation covering the greater portion of the tube. At the same time, I have produced a reinforcement for the expanded portion of the tube which is locked in position and which protects the tube at the point where it is clamped to the steering post.

While I have described the method and invention in connection with a handle bar, it will be understood that the invention has broader application. It may be employed with tubes of different types and employed for different purposes for forming enlargements and with reinforcements about the enlarged areas.

Further, while I have described one specific method of accomplishing the expansion, it will be observed that a great many of the details may be modified by those skilled in the art without departing from my invention. Further, while I have set forth some details, it will be observed that some of the details may be obviously omitted.

The foregoing detailed description has been given for clearness of understanding only, and no unnecessary limitations should be understood therefrom, but the appended claims should be construed as broadly as permissible in view of the prior art.

I claim:

1. In a method for expanding a tube at an intermediate point and reinforcing the same where expanded, said tube being of uniform inner and outer diameters prior to expansion, the steps of inserting a small piece of tube within said outer tube, said inner tube having an outside diameter throughout substantially equal to the inside diameter of said outer tube, to the point where the said outer tube is to be expanded, one end portion of said inner tube being tapered outwardly from the inner surface thereof, inserting a stop member through the opposite end of the outer tube to prevent further movement of the inner tube longitudinally, and then forcing a cylindrical tool, having an outside diameter substantially equal to the inside diameter of said outer tube to be expanded and an inwardly inclined forward edge, into engagement with said tapered end portion and through the greater part of said inner tube to expand the same and the adjacent portion of said outer tube and to provide an inward taper on said end portion of said inner tube, locking the same against longitudinal movement within the expanded outer tube.

2. In a method for expanding the central portion of a handle bar tube and reinforcing the same where expanded, said tube being of uniform inner and outer diameters prior to expansion, the steps of inserting a small piece of tube within said outer tube to the central portion thereof, said inner tube having an outside diameter throughout substantially equal to the inside diameter of said outer tube and said inner tube having one end portion tapered outwardly from the inner surface thereof with a long inclination, inserting a stop member through the opposite end of said outer tube to engage the untapered end of said inner tube and prevent further movement thereof longitudinally, and then forcing a cylindrical tool provided with a forward inclined portion adapted to engage the tapered portion of said inner tube, said tool having an outside diameter substantially equal to the inside diameter of said outer tube, into engagement with the tapered end portion of said inner tube and through the greater part of said inner tube to expand the same and the adjacent portion of said outer tube and to provide an inward taper on said end portion of said inner tube, locking the same against longitudinal movement within the expanded outer tube.

CORNELIUS J. BARRY.