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F. H. LE JEUNE ET AL

2,139,833

METHOD OF FORMING RIMS OF NONSYMMETRICAL CROSS SECTIONAL CONTOUR

Filed Jan. 6, 1936

2 Sheets-Sheet 1

FIG.1.

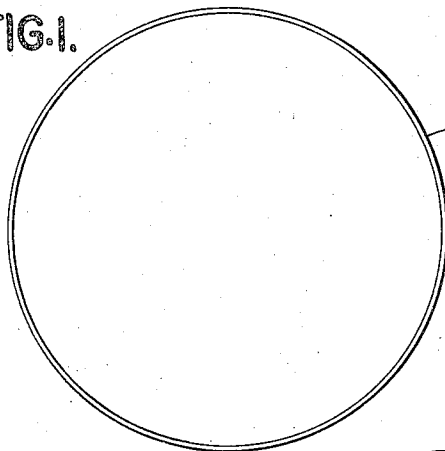


FIG.2.

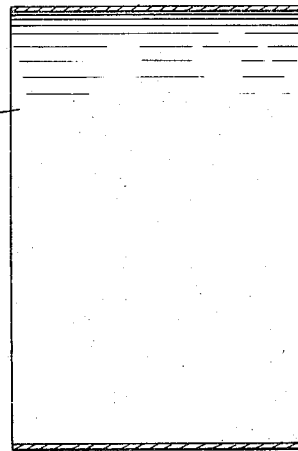


FIG.3.

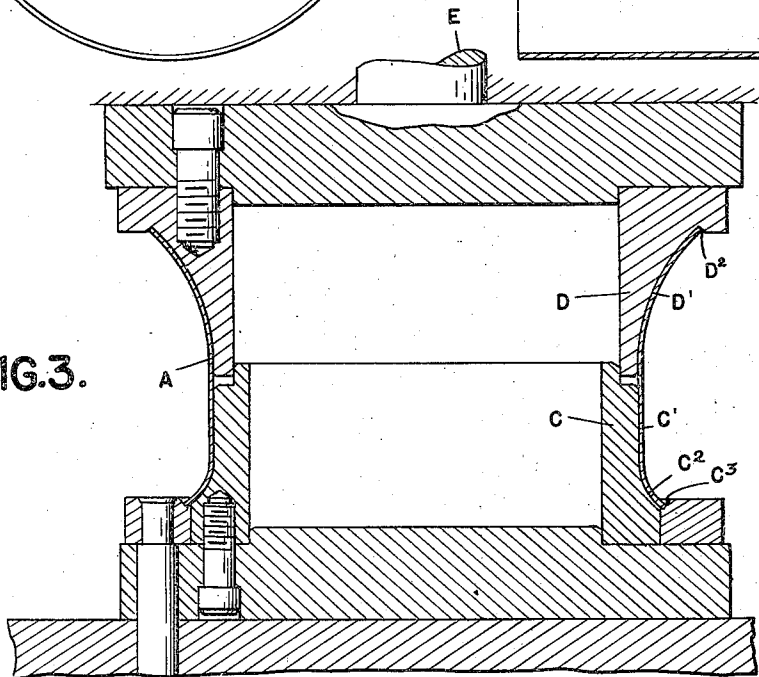
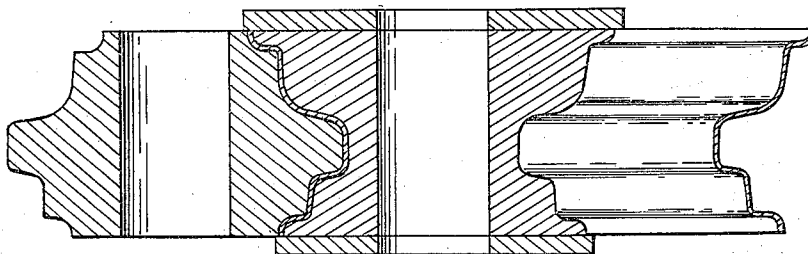


FIG.7.

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2 Sheets-Sheet 2

FIG.4.

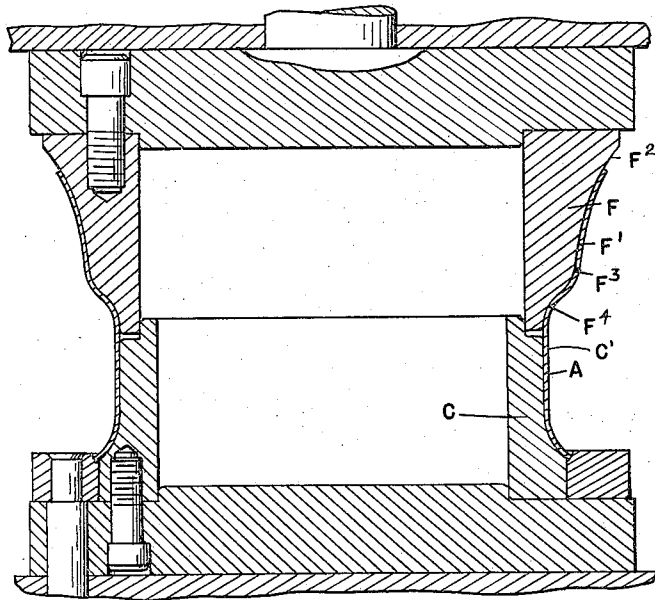


FIG.5.

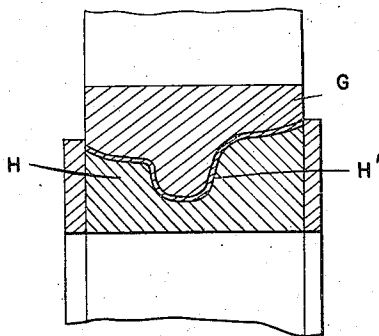
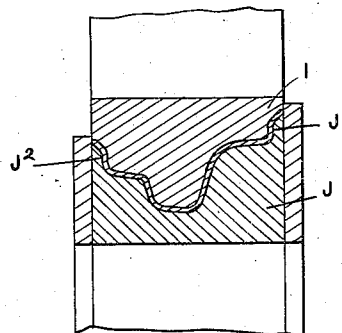


FIG.6



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METHOD OF FORMING RIMS OF NONSYMMETRICAL CROSS-SECTIONAL CONTOUR

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Application January 6, 1936, Serial No. 57,832

5 Claims. (Cl. 29—159.1)

The invention relates to the manufacture of rims and more particularly tire holding rims of that type sometimes designated as "peg leg" and in which the bead seats on opposite sides of the central plane are of unequal diameter. In the forming of such rims, it is essential that these bead seats should be of the proper relative diameters, and where the rim is formed by a rolling process this is difficult to accomplish. We have, therefore, devised a process in which the rim seats are first die-fashioned to proper relative diameters and subsequently the portions between these seats and outside thereof are refashioned to the desired cross-sectional contour. The invention, therefore, consists in the novel method as hereinafter set forth.

In the drawings:

Figure 1 is an elevation of, and

Figure 2 is a cross-section through a cylindrical hoop which is to be refashioned into the rim;

Figure 3 is an axial cross-section through the dies for performing the first step in the operation;

Figure 4 is a similar view showing the second step;

Figures 5, 6 and 7 are cross-sectional views showing the successive steps in refashioning the rim.

In the forming of rims of symmetrical cross-section by a rolling process the amount of metal on one side of the central plane is more or less in balance with that on the opposite side so that both sides can be simultaneously refashioned to the desired contour. However, in the forming of rims of the so-called "peg-leg" construction, there is more metal on one side of the central plane of the finished rim than on the other and the radial dimensions are also different on opposite sides of this plane. This renders it difficult to accurately form the rim completely by a rolling process. To overcome this difficulty, we first fashion the rim by dies so that the portions thereof which respectively form the bead seats for the opposite sides of the tire are of the correct relative diameters. These bead seats are also positioned so that the metal between the same is sufficient to form the drop-center portion of the rim, and the metal on the outer sides is proper for forming the flanges of the rim. After this preliminary fashioning operation, the rim is refashioned either by rolling or in any other suitable manner to obtain the desired cross-section.

As shown in Figures 1 and 2, A is a cylindrical hoop preferably formed in the usual manner by the bending of a rectangular strip of metal into

circular form and uniting the opposite ends thereof by welding. This hoop is then subjected to a die pressing operation which flares the opposite end portions thereof differentially. Thus, as shown in Figure 3, one end of the hoop is engaged with a die member C having a cylindrical portion C' corresponding to the diameter of the bead seat of smaller radius and also having a flaring portion C² for initiating the flange on this side of the rim. A second die member D engages the opposite end of the cylindrical hoop and is provided with a flaring portion D' of greater length and diameter. In operation, the hoop is first engaged with the cylindrical portion C' of the die C, after which the die D is moved towards the die C by the operation of a plunger E. This will simultaneously expand the portions of the hoop which engage the flaring portions C² and D', the action being limited by stops C³ and D² respectively at the outer ends of these flaring portions.

After this first operation, the hoop while still in engagement with a die C or a die of corresponding form is subjected to the operation of a die F having a portion F' corresponding to the diameter of the bead seat of larger radius and a flaring portion F² above the portion F'. The lower end of the die F is also formed with reverse curves F³ and F⁴ which are tangent to each other and respectively to the portions F' and C'. Thus, in the operation of the die F the rim is fashioned to the cross-section shown in Figure 4.

The subsequent operations of refashioning the rim are preferably performed by complementary rollers. Thus, as shown in Figure 5, the rollers G and H fashion the portion of the rim intermediate the bead seats to initiate the drop-center H'. In the next operation shown in Figure 6, the rollers I and J further fashion the drop-center portion and initiate the flanges by the portions J' and J². In the final operation shown in Figure 7, the rim is brought to the desired cross-sectional contour. It is to be noted that during these refashioning operations the portions forming the bead seats remain in the same relative positions and are properly spaced upon opposite sides of the central plane of the rim. Further finishing operations may be performed on the rim, but these form no part of the present invention.

What we claim as our invention is:

1. In a method of forming tire rims of non-symmetrical cross-section, the steps of die-pressing a cylindrical hoop to differentially flare opposite end portions thereof and to form a bead seat portion adjacent to the smaller flared portion,

further die-fashioning the larger flare portion to expand a sub-portion thereof to the relative diameter of the second bead seat leaving a shoulder between the two bead seat portions and
 5 finally refashioning the portions between and on opposite sides of said bead seat portions to the desired cross-sectional contour.

2. In a method of forming tire rims of non-symmetrical cross-section, the steps of die-press-
 10 ing a cylindrical hoop to differentially flare opposite end portions thereof and to form a bead seat portion adjacent to the smaller flared portion, further die-fashioning the larger flared portion to expand a sub-portion thereof to the
 15 relative diameter of the second bead seat leaving a shoulder between the two bead seat portions and rolling to refashion the portions between and on opposite sides of said bead portions to the desired cross-sectional contour.

20 3. In a method of forming drop-center tire rims having bead seats of different radius, the steps of die-pressing a cylindrical hoop to differentially flare opposite end portions thereof and to form a bead seat portion adjacent to the
 25 smaller flared portion, further die-fashioning the larger flared portion to expand a sub-portion thereof to the relative diameter of the second bead seat leaving a shoulder and a portion of the rim between said seats, refashioning
 30 the portion between said seats to contract the

diameter thereof and form the drop-center or well and refashioning the portions outside said seats to form the rim flanges.

4. In a method of forming drop-center tire rims having bead seats of different radius, the
 5 steps of die-pressing a cylindrical hoop to differentially flare opposite end portions thereof and to form a bead seat portion adjacent to the smaller flared portion, further die-fashioning the
 10 larger flared portion to expand a sub-portion thereof to the relative diameter of a second bead seat leaving a shoulder and a portion of the rim there-between and rolling to refashion the portion between said seats contracting the
 15 radius thereof to form the drop-center or well and refashioning the portion outside said seats to form the rim flanges.

5. In a method of forming tire rims of non-symmetrical cross-section, the steps of die-press-
 20 ing a cylindrical hoop to differentially flare opposite end portions thereof and to form bead seat portions of different diameters with a shoulder therebetween, contracting in diameter the portion between said bead seat portions while
 25 maintaining the latter at substantially their original diameters and expanding the portions on opposite sides of said bead seat portions to the desired cross-sectional contour.

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