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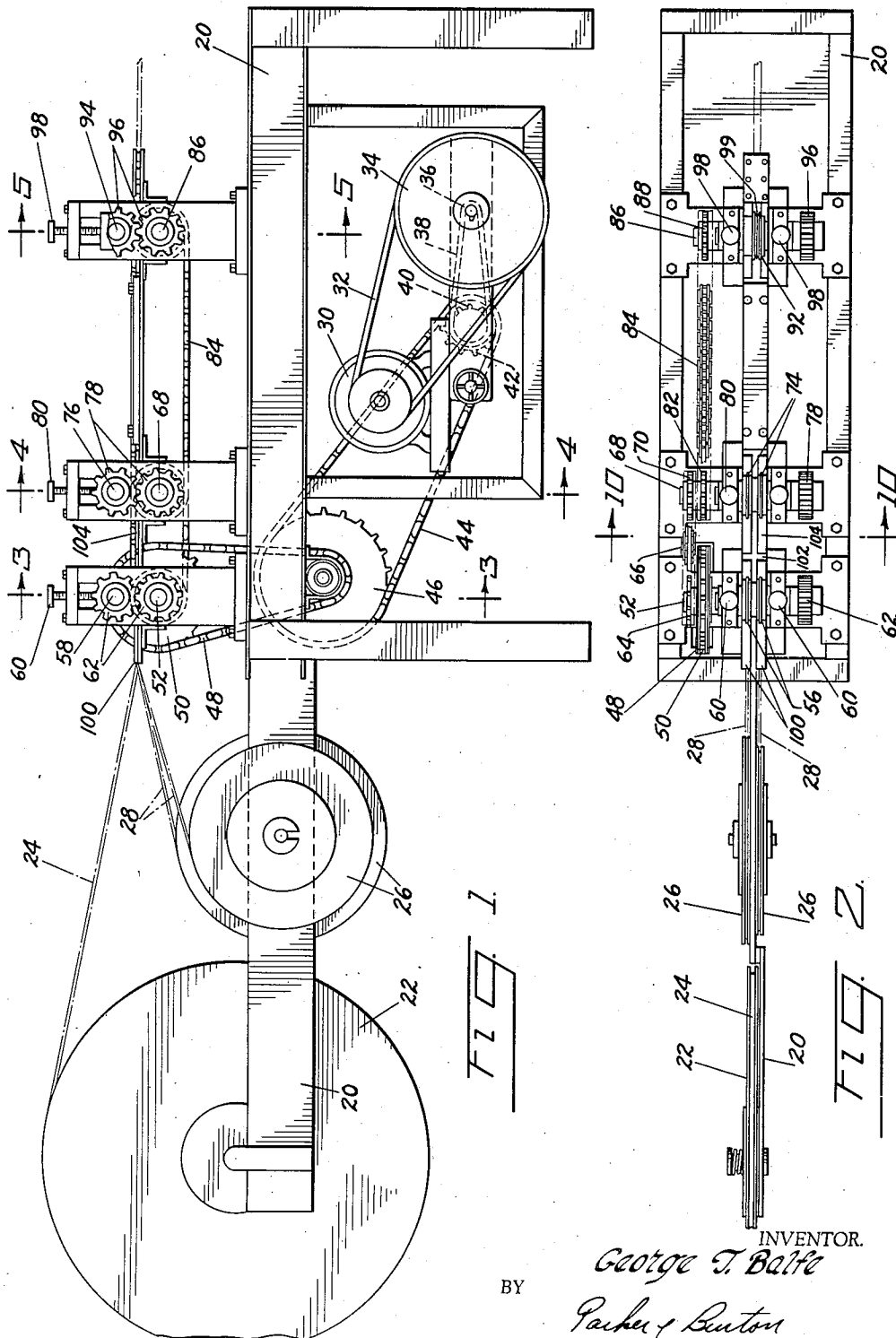
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METHOD FOR APPLYING BEADS TO THE MARGINS OF STRIPS

Filed March 20, 1941

3 Sheets-Sheet 1



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3 Sheets-Sheet 2

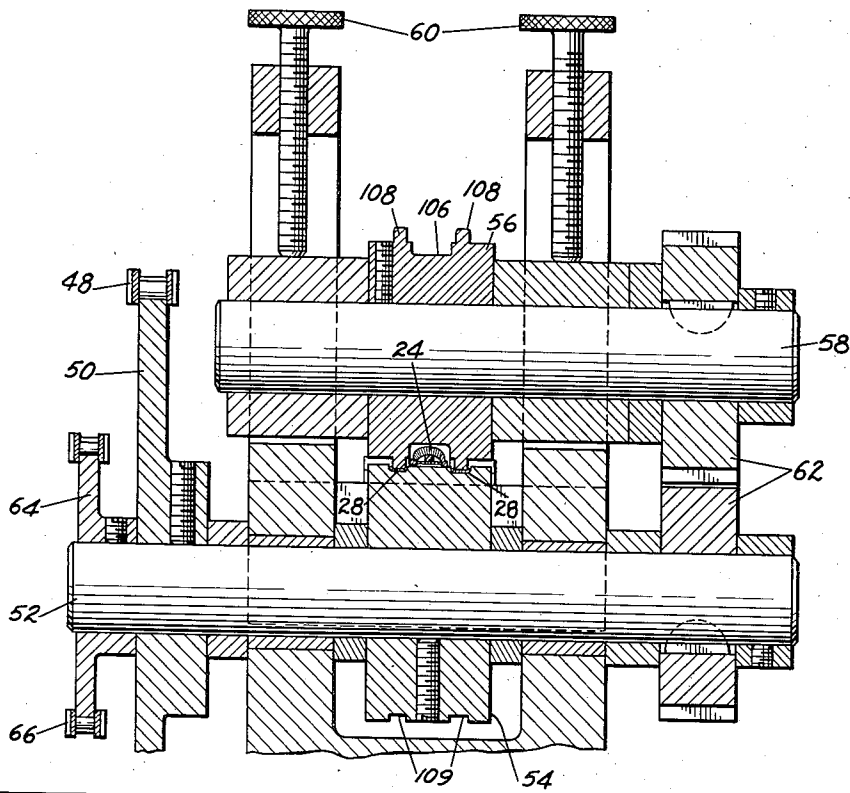


FIG. 3.

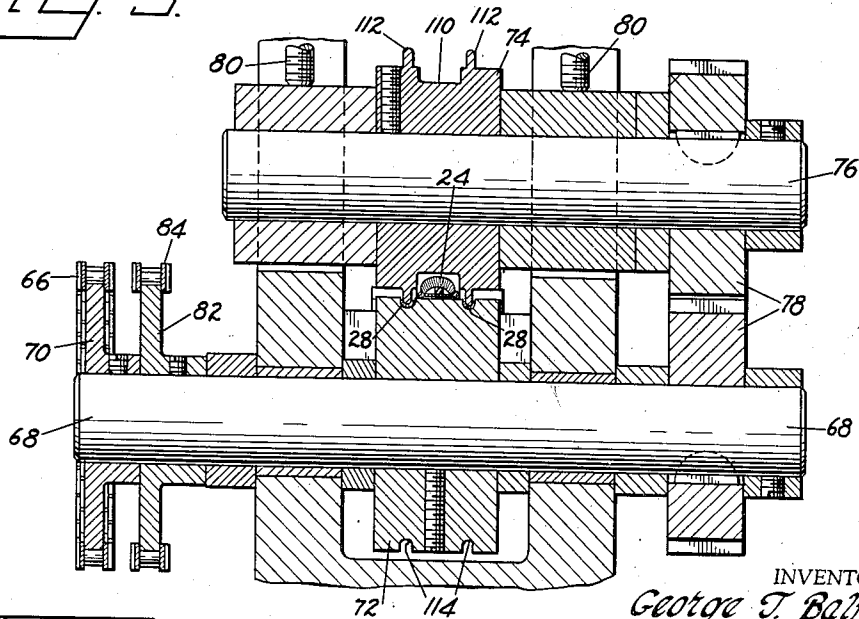


FIG. 4.

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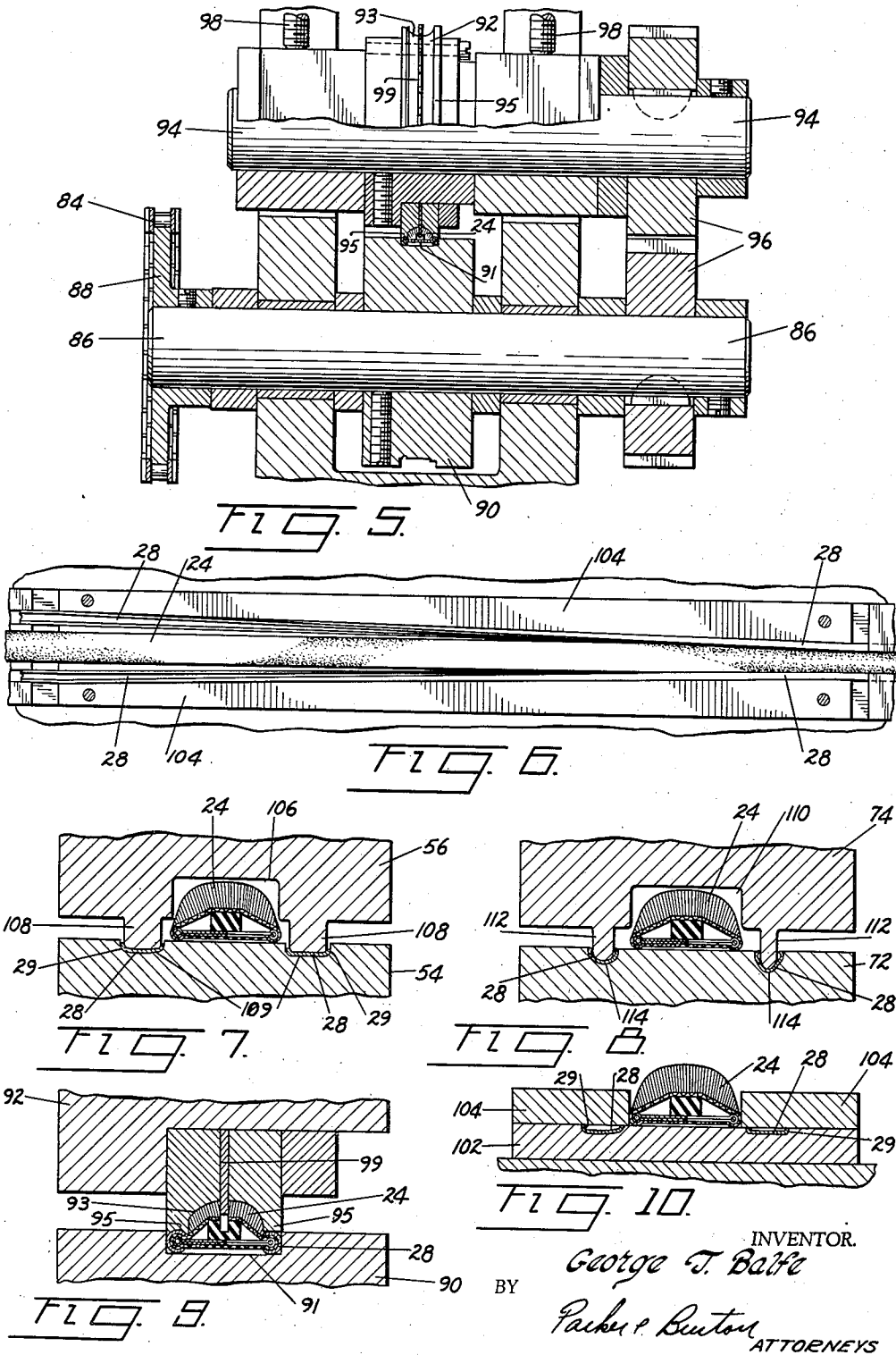
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UNITED STATES PATENT OFFICE

2,346,347

METHOD FOR APPLYING BEADS TO THE MARGINS OF STRIPS

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1 Claim. (Cl. 153—1)

This invention relates to improvements in a method of applying a metal bead about the margin of a strip of material such as a trim strip or glass run guide for automobile closed bodies.

An object is to provide an improved method for rapidly, economically, accurately, and securely applying a metal bead about a margin of a strip of material.

A further object is the provision of a simple method adapted to advance a strip of material lengthwise and to advance a flat metal band simultaneously in the same direction and during such advance to shape the band into the desired channel form and to direct it to embrace one margin of the strip and to fold the side walls into snug tight fitting engagement with the strip forming a bead along said margin.

Other objects, advantages, and meritorious features will more fully appear from the following description, appended claim, and accompanying drawings, wherein:

Figure 1 is a side elevation of mechanism adapted to carry out the process of my invention,

Fig. 2 is a plan view of the structure shown in Fig. 1,

Fig. 3 is a vertical fragmentary section taken on the line 3—3 of Fig. 1,

Fig. 4 is a vertical fragmentary section taken on line 4—4 of Fig. 1,

Fig. 5 is a vertical fragmentary section on line 5—5 of Fig. 1,

Fig. 6 is a plan of a portion of the guide shown in Fig. 1 with the top plate removed,

Fig. 7 is an enlarged fragmentary section of the shaping rolls taken on the same line as Fig. 3,

Fig. 8 is an enlarged fragmentary section of the shaping rolls taken on the same section line as Fig. 4,

Fig. 9 is an enlarged fragmentary section of the shaping rolls taken on the same section line as Fig. 5, and

Fig. 10 is an enlarged fragment of the track and guide way taken on the section line 10—10 of Fig. 2.

The improved method described herein is illustrated in conjunction with mechanism shown in the drawings which embodies a frame work 20 which carries the operating mechanism. At one end there is supported for rotation a spool 22 upon which is wound a flexible strip of trim material 24. The trim strip 24 is of the form used as a glass run guide. It is adapted to be unwound from the spool when advanced through the machine.

At the same end of the machine are two spools 26 supported for rotation. Each spool 26 has wound thereupon a band of metal 28. Each of these metal bands is adapted to be withdrawn from the spool and passed through the machine to be shaped and crimped over a margin of the strip 24 as hereinafter described.

The machine is provided with a motor 30 which may be driven from any suitable source of power, not shown, and which in turn by means of a belt 32 drives a fly wheel 34. Mounted upon the same shaft with the wheel 34 is a small gear wheel 35 which, through a drive chain 38 drives a gear wheel 40 which, through its shaft and a gear wheel 42, drives chain 44 and drive wheel 46. Drive chain 48 couples the wheel 46 with a large gear wheel 50 which is keyed to a shaft 52 (Figs. 1 and 3). This shaft 52 carries a shaping roll 54 which cooperates with a shaping roll 56 carried by an idler shaft 58 superimposed above the shaft 52 and adapted to be adjustably held toward such shaft by adjustment screws 60. The adjacent ends of the two shafts 52 and 58 opposite the gear wheel 50 are coupled together by spur gears 62. This construction forms the first pair of shaping rolls.

The shaft 52 carries a drive gear 64 adjacent the drive gear 50. Chain drive 66 couples this drive gear 64 with shaft 68 through a gear 70 mounted upon the shaft 68 to drive the shaft. This shaft 68 carries a shaping roll 72 which cooperates with a shaping roll 74 mounted upon idler shaft 76. The two shafts 68 and 76 are coupled together by spur gears 78. Adjustment mechanism in the form of adjustment screws 80 similar to the adjustment screws 60 are provided.

The shaft 68 carries a drive gear 82 which through drive chain 84 drives shaft 86 through gear 88 mounted thereon. The shaft 86 carries a shaping roll 90 which cooperates with shaping roll 92 mounted upon idler shaft 94. The two shafts 86 and 94 are coupled together by idler spur gears 96. Adjustment screws 98 are provided for adjustment as described in connection with the two other pairs of cooperating shaping rolls. In each instance suitable bearings for the shafts are provided and supports and key members common to the art are shown. The standards are cut away as shown in Figs. 3 and 4 to provide clearance for the shaping rolls. The three pairs of shaping rolls operate successively on the metal bands to shape them and urge them about the margin of the strip and crimp them thereon.

In carrying out the method of my invention the strip 24, the margins of which are to be en-

cased within the metal beads, enters a guideway 100. This guideway 100 is also shaped to receive the metal bands 28. A cross section of the guideway between the two pairs of shaping rolls is shown in Fig. 10 and it comprises a bed plate 102 and parallel spaced apart guide plates 104. The strip 24 is shown as held between the guide plates 104. The bands 28 are shown in this figure after they have passed through the first pair of shaping rolls but are positioned in channels in the bed plate 102 underneath the guide plates 104. The first section of the guide assembly 100 carries the three strips up to the first pair of shaping rolls 54 and 56. Shaping roll 58 is cut away as at 106 to pass the strip 24 therethrough. The other shaping roll 54 is provided with grooves 109 which receive the bands 28 and male members 108 encircle the roll 56 and enter these grooves and act upon the bands to fashion them to provide upwardly projecting shoulders 29 as shown in Figs. 7 and 10. Fig. 7 is an enlarged sectional fragment taken on the same line as Fig. 3. Fig. 10 shows the shape of the bands and their position relative to the strip 24 as they pass through the guideway between the first and second pair of rolls on the line 10-10 of Fig. 2.

The second pair of shaping rolls 72 and 74 illustrated particularly in Fig. 4 show that roll 74 is cut away providing a circumferential channel 110 through which passes the strip 24 as shown in Figs. 4 and 8. This same roll is provided with encircling male flanges 112 shaped to fashion the bands 28 into channel form within grooves 114 formed in the shaping roll 72 as shown in Figs. 4 and 8.

After the strip 24 and the bands now shaped to channel form leave the second pair of shaping rolls 72 and 74 they pass through that section of the guideway indicated in Fig. 6 and the guide members 104 are formed with a milled face engaging the channel shaped bands 28 and serve to rotate them, as they advance, about their linear axes through an arc of 90° so that as the channel shaped bands enter the third pair of shaping rolls 90 and 92 they have been turned to face the adjacent margins of the guide strip 24. The milled faces of these guide plates also approach each other so that the channel members 28 are urged thereby to be received over the adjacent margins of the strip 24 so that as they enter between the cooperating rolls 90 and 92 they have been urged into engagement over the adja-

cent margins of the strip 24 as shown particularly in Figs. 5 and 9.

The shaping rolls 90 and 92 are fashioned to receive the guide strip 24 and to urge the side walls of the bands 28 against the guide strip. The roll 90 is provided with a circumferential channel 91 and the roll 92 is provided with a circumferential channel 93 the opposite side walls 95 of which urge the channel bands 28 into crimping engagement against the opposite sides of the strip 24.

Due to the fact that the bands are first formed with projecting shoulders 29 normal to the plane of the band as shown in Fig. 7 and are thereafter fashioned into channel form these shoulders 29 project inwardly toward each other and overhang the channel opening in the band as shown in Fig. 8. These shoulders therefore bite into the material of the strip 24 when the side walls of the channel are urged together as shown in Fig. 9 so that the engagement of the band with the margin of the strip is a particularly secure engagement. These low shoulders are embedded in the material of the strip spaced from the margin and securely maintain the band thereon.

To assist in feeding the strip along a drag wheel 99 is mounted upon feed roll 92 (Figs. 5 and 9) which wheel engages the strip 24 acting to advance the strip.

What is claimed:
That method of forming a metal bead about the margin of a strip of material comprising advancing the material strip lengthwise, advancing a flat metal band lengthwise and in the same direction and simultaneously acting thereupon by bending the band, forming a low shoulder along each edge projecting substantially normal to the plane of the band and bending the band into a substantially U-shaped channel with the marginal shoulders projecting toward each other along the margin of the side walls of the channel, moving the channel shaped band toward a margin of the strip while advancing the band and the strip lengthwise and in the same direction to embrace said strip, and urging the side walls of the channel toward each other and against opposite sides of the strip embedding the shoulders within the strip of material spaced inwardly from the margin thus forming a bead along said margin.

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