

March 31, 1936.

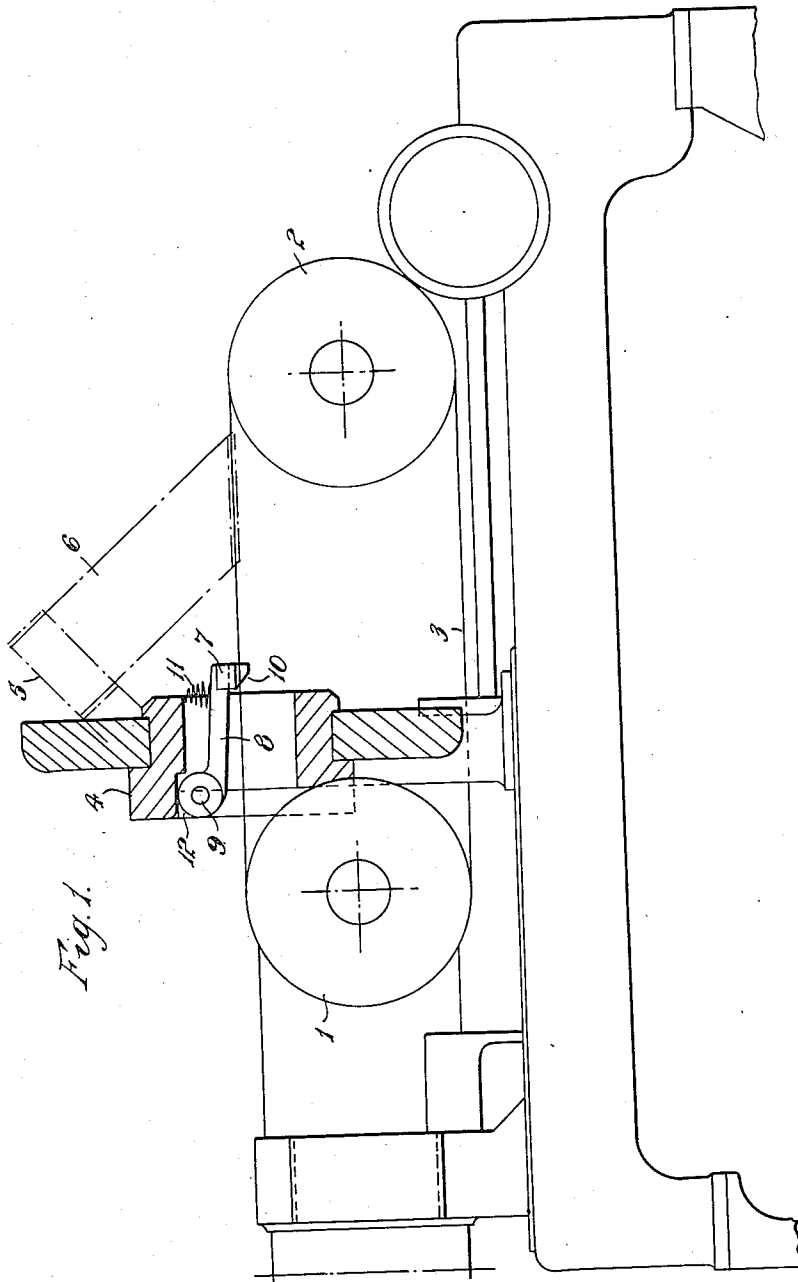
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2,035,821

TIRE MAKING APPARATUS

Filed June 25, 1935

3 Sheets-Sheet 1



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Fig. 2.

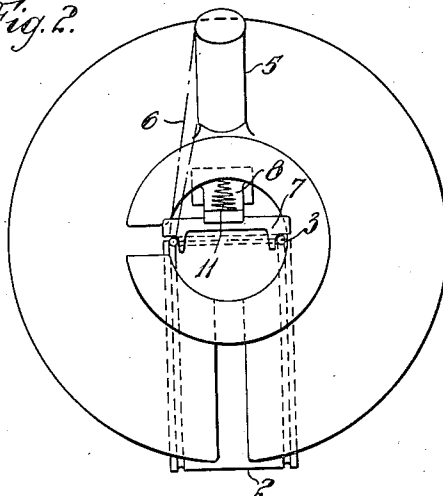


Fig. 3.

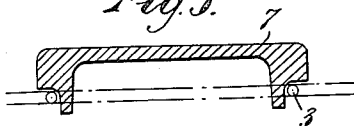


Fig. 5.

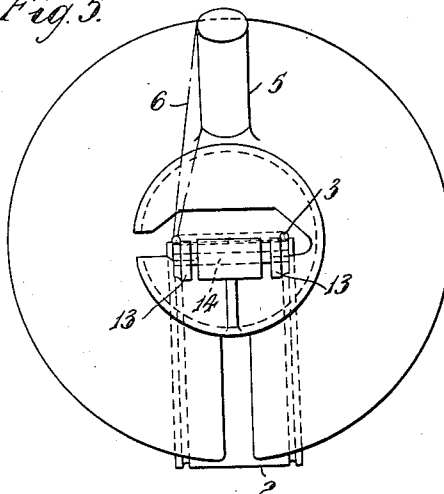
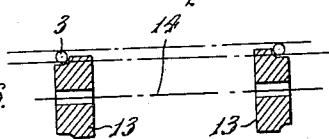


Fig. 6.



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3 Sheets-Sheet 3

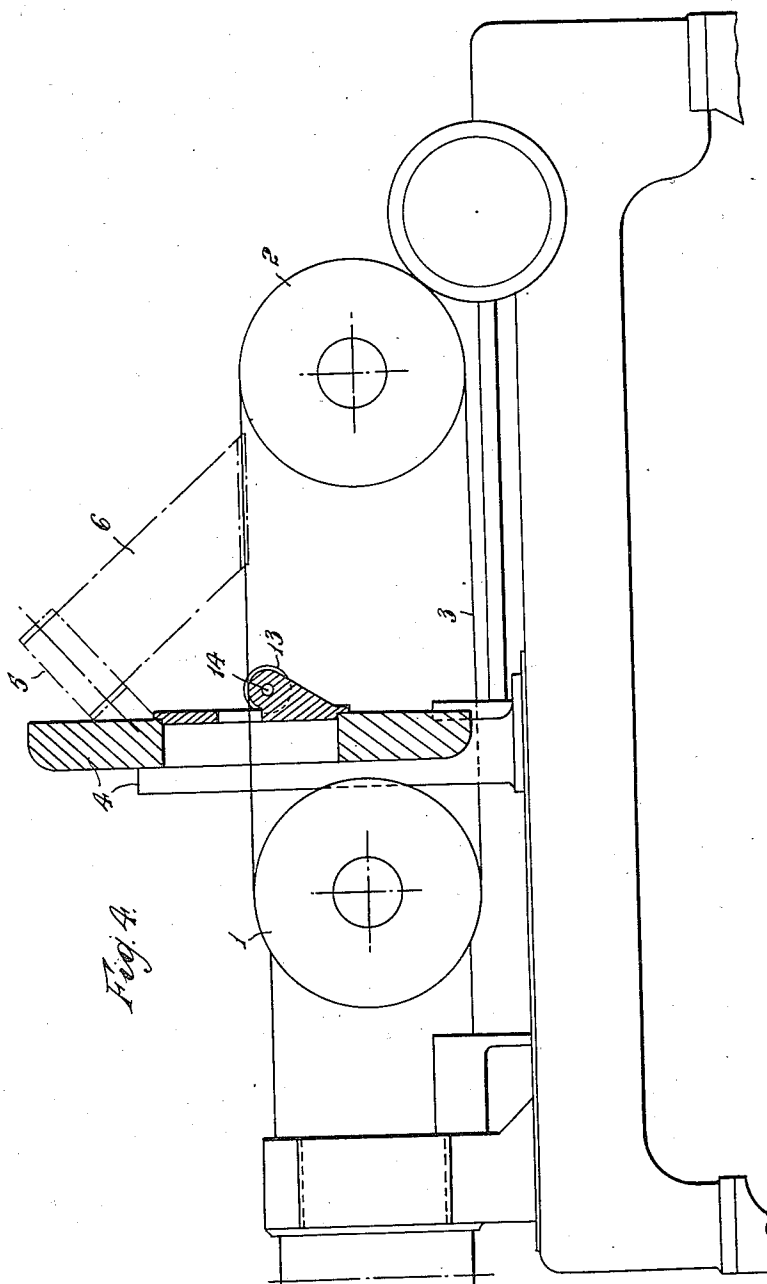


Fig. 4.

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UNITED STATES PATENT OFFICE

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TIRE MAKING APPARATUS

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In Great Britain June 27, 1934

4 Claims. (Cl. 154—11)

This invention relates to the manufacture of tire covers by the method in which the carcass or foundation part of such covers is built up by applying a strip or strips of material to a pair of spaced endless wires or beads, hereinafter called wires, extending between spaced supporting points.

One form of apparatus for this type of manufacture comprises a pair of drums or equivalent means between which a pair of endless wires extend under tension and in spaced relation, said drums, or one of them, being operable to advance the wires longitudinally while the application of said strip to said wires proceeds, by rotating a spool or spools of strip around one flight of said wires, the combined effect i. e. advance of the wires with rotation of the spool or spools about them, being to lay a plural stratum of fabric helically around the wires.

Normally the laying of said strip about the wires tends to pull the wires together locally, i. e. the wires may become out of parallel, and heretofore this hastened to produce a non-uniform and deleterious effect upon the product.

My invention obviates these ill effects and thus increases the efficiency of manufacture and improved quality of product, also it positively controls the width of the carcass, which is important in many respects.

According to this invention means are provided, hereinafter called the spacing means, disposed between the wires to keep the same apart the correct distance at the required tension, that is, to prevent unwanted decrease of the distance between the wires as by the tendency of the strip to pull the wires together as it is laid thereabout.

It is important to control the width or spacing of the bead wires as a desideratum per se and also as a means of facilitating, and ensuring accuracy in, subsequent operations, particularly moulding.

But further, if one can be sure that said width is invariable, one can control the amount of overlap of the helices of strip to very fine limits, if not entirely delete such overlap altogether.

This is important not only from the point of view of improving the quality of the product but also from the point of view of economy of strip material—excess overlap, apart from being undesirable in the product, is also a wastage of material.

Thus in general it will be seen that the invention involves an improved method and means for tire manufacture adapted to produce a better

product, and further to be more economical, than has hitherto been common.

The various features of the invention are illustrated, by way of example, in the accompanying drawings, in which:—

Fig. 1 is a side view illustrating one form of the invention; Fig. 2 is a part end view thereof; Fig. 3 a detail view of the spacing means thereof; Fig. 4 is a side view illustrating another form of the invention; Fig. 5 being a part end view thereof and Fig. 6 a detail view of the spacing means thereof.

Referring to the drawings, the aforesaid spaced supporting points as illustrated comprise a pair of drums 1 and 2, the wires 3 passing over the same as shown.

The spacing means are preferably carried by the stationary bearing or track 4, hereinafter called the track, around which the spool 5, of strip 6 rotates. In this way said spacing means 20 is positioned at the most appropriate point, viz., adjacent the spool 5, where distortion of the wires is most likely to start, said spacing means keeping the wires apart the correct distance, appropriately firm, adjacent the point at which 25 the strip is laid onto them.

In the embodiment illustrated in Figs. 1, 2 and 3 the spacing means comprise a contoured bar 7 adapted to engage the wires as shown diagrammatically in Fig. 3. This bar is preferably carried on a lever 8 pivotally mounted at 9 upon a part of the stationary spool track 4. The movement thus provided for allows the wires to be positioned on the drums 1 and 2 and also allows the wires to pass the spacing means when 35 the strip has been laid onto said wires: means may be provided automatically to move the spacing means out of the way or alternatively it may be done by hand.

Automatically, it may be done in various 40 ways—for example, as shown in Fig. 1 the bar 7 is formed into skids 10 for this purpose, the laid strip contacting said skids and so pushing the spacing means out of the way of the last bit of strip.

The bar 7 may be spring loaded as shown at 45 11 or alternatively we may rely on its weight alone. The lever 8 preferably has a stop 12 which defines the position of the bar 7 in relation to the wires.

In another and preferred arrangement, see 50 Figs. 4, 5 and 6, the spacing means do not move as above described but operate always in a fixed position.

In one form of this embodiment said means 55

comprise a pair of rollers 13 carried on a spindle 14 fixed upon a part of the spool track 4, said rollers being suitably contoured to engage the wires as shown diagrammatically in Fig. 6.

5 This arrangement enables the wires to be positioned on the main supports aforesaid without manipulation of the spacing means and similarly it avoids the necessity of manipulating said means to allow the wrapped part of the wires to
10 pass, this allowing the wires to be fully wrapped without interruption into the form of a complete carcass.

It will be seen that in the first described arrangement, the spacing means extend right
15 through the sectional plane of the wires as shown diagrammatically in Fig. 3, said spacing means being carried outside the flights of wire and extending inwardly thereof as shown in Fig. 1: In the alternative arrangement, said
20 spacing means extend into but not through said sectional plane as shown diagrammatically in Fig. 6, said spacing means being carried inside said flights, extending outwardly thereof as shown in Fig. 4.

25 It should be understood that the invention is not limited to any one particular form, as said invention may be embodied in a number of different forms without departing from the spirit of it.

30 For example, instead of supporting the spacing means from the stationary spool track, said means may be supported from some other stationary part, or even from a suitable moving part. As to the latter, for example, said means
35 may be supported from the structure of one of the main supporting points aforesaid—which latter are usually relatively movable apart to tension the wires in the first instance.

And, of course, other details may also be varied, as for example, rollers may be used
40 instead of a bar such as 7, and vice versa, or a combination of the two may be used.

Having now particularly described the invention I claim:—

45 1. Tire making apparatus which comprises a pair of drums mounted on parallel spaced axes to carry a pair of spaced bead wires, a stationary track encircling one lay of said wires, spacing means carried by said stationary track to
50 hold said wires in fixed spaced positions between said drums and a winding spool mounted on said track to wrap fabric about said spaced wires, near said spacing means, said drums being rotatable to cause said wrapped material to lie helically on said spaced wires, said spacing means

comprising rollers having edge grooves to position said wires, each of said edge grooves having a surface parallel to a corresponding surface of the other edge groove extending into but not past the sectional plane of the wires.

5 2. Tire making apparatus which comprises means for spacing a pair of endless bead wires, means for drawing said wires simultaneously and at equal speeds past said spacing means, and means to wrap a strip of material helically
10 about said spaced bead wires near said spacing means, said spacing means having parallel plane spacing surfaces projecting from one side of the plane of said spaced beads a short distance past the inside of the respective beads to hold said
15 beads normally in spaced relation but to permit a relative displacement of beads and spacing means transversely to the plane of the beads to permit said beads to clear said spacing surfaces.

3. Tire making apparatus which comprises
20 a pair of drums rotatably mounted on parallel spaced axes to support endless bead wires in spaced position, and spacing means between said drums to hold said bead wires in fixed spaced relation, and means to wrap fabric helically
25 about said spaced wires near said spacing means, said spacing means having parallel plane spacing surfaces projecting from one side of the plane of said spaced beads a short distance past the inside of the respective beads to hold said beads
30 normally in spaced relation but to permit a relative displacement of beads and spacing means transversely to the plane of the beads to permit said beads to clear said spacing surfaces.

4. Tire making apparatus which comprises a
35 pair of drums mounted on parallel spaced axes to carry a pair of spaced bead wires, a stationary track encircling one lay of said wires, spacing means carried by said stationary track to hold said wires in fixed spaced positions between
40 said drums, and a winding spool mounted on said track to wrap fabric about said spaced wires near said spacing means, said drums being rotatable to cause said wrapped material to lie helically on said spaced wires, said spacing
45 means having parallel plane spacing surfaces projecting from one side of the plane of said spaced beads a short distance past the inside of the respective beads to hold said beads normally in spaced relation but to permit a relative
50 displacement of beads and spacing means transversely to the plane of the beads to permit said beads to clear said spacing surfaces.

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