May 17, 1927. 1,629,173

H. N. PARSONS

METHOD OF MAKING BALL RETAINERS

Filed March 5, 1926

Fig. 1.

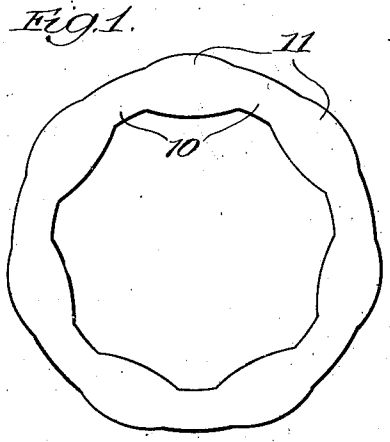


Fig. 2.

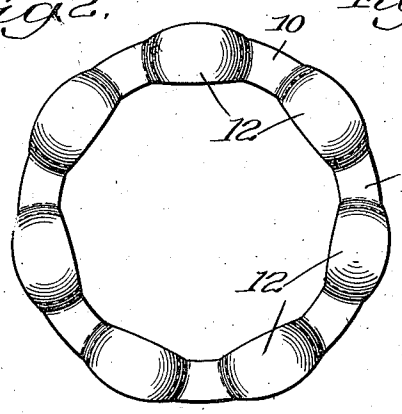


Fig. 3.



Fig. 4.

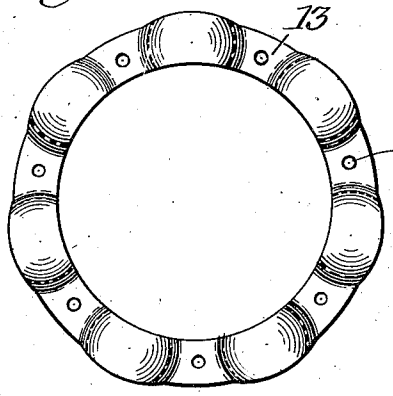


Fig. 5.

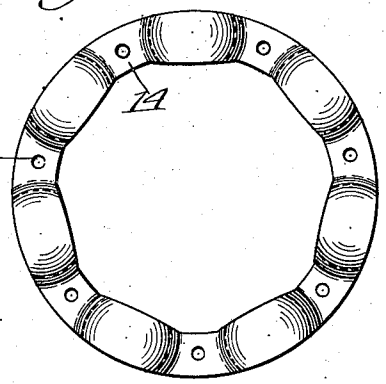


Fig. 6.

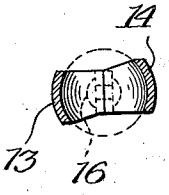


Fig. 7.

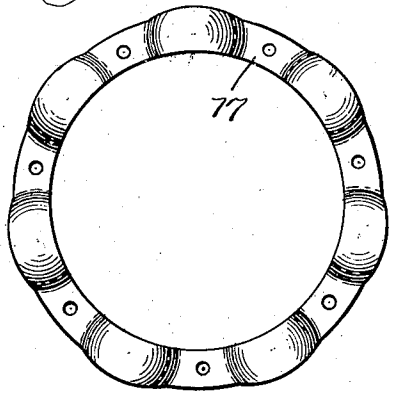


Fig. 8.

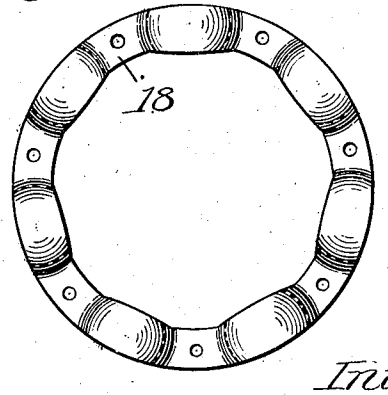
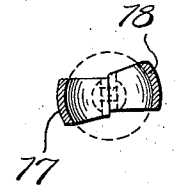


Fig. 9.



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Patented May 17, 1927. 1,629,173

UNITED STATES PATENT OFFICE.

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METHOD OF MAKING BALL RETAINERS.

Application filed March 5, 1926. Serial No. 92,465.

This invention relates to ball retainers and to the method of making the same, and is fully described in the following specification and is shown in the accompanying drawings, in which:

Fig. 1 is a front elevation of the flat blank from which the retainer elements are made;

Fig. 2 is a similar view of the same showing the intermediate portions pressed up to form hemispherical ball pockets;

Fig. 3 is a side elevation of the same;

Fig. 4 is the blank trimmed to a true circle on the inside;

Fig. 5 is the blank of Fig. 2 trimmed to a true circle on the outside;

Fig. 6 is a transverse section of the ball retainer showing the blanks of Figs. 4 and 5 assembled and riveted; and

Figs. 7, 8, and 9 are views similar to Figs. 4, 5, and 6 respectively showing the blank of Fig. 2 trimmed so as to form a narrower retainer.

The embodiments illustrated comprise ball retainers which are made from a flat piece of sheet steel or the like, as shown in Fig. 1, in which are concentric circular portions 10 between which are wider intermediate portions 11. The latter extend on both sides of the circular portions 10 and, on the next operation, are curved upwardly to form semi-spherical ball pockets 12 as shown in Figs. 2 and 3.

The ball retainers shown in section in Figs. 6 and 9 are adapted primarily to be used with angular contact bearings. For this reason, the retainer element 13 is trimmed to a true circle on the inside, while the element 14 is trimmed to a true circle on the outside, these two circles preferably being substantially coincident with the circular portions 10 of Fig. 1. Thus, it will be seen, the axis of the ball pocket lies at an angle to the axis of the retainer. The flat portions of both of these blanks are provided with registering openings 15 adapted to receive rivets 16 as shown in Fig. 6. By this arrangement, the inner edge of one element and the outer edge of the other is serrated while the other edges are circular.

In Fig. 7 is shown an element 17 or ball retainer with the inside trimmed to a larger diameter than that of Fig. 4. Fig. 8 shows a corresponding element 18 trimmed to a smaller outside diameter than that of Fig. 5. When these two are then assembled as shown in section in Fig. 9, the elements appear to be slightly offset thereby providing a somewhat narrower ball retainer which may be used on angular contact bearings having a smaller clearance between the runways.

This trimming of the ball retainer elements to a true circle both inside and outside is done from the blank after it is formed into cups as shown in Figs. 2 and 3. Thus a number of retainers may be formed from this cupped blank by the relatively simple and inexpensive operation of trimming it by means of circular dies (not shown).

Thus it will be seen that a number of relatively complicated ball retainer structures may be made from a single blank, the only expensive dies to manufacture and maintain being those which are required to cut the original blanks shown in Fig. 1.

While I have shown and described but a single embodiment of this invention, it is to be understood that it is capable of many modifications. Changes therefore in the construction and arrangement may be made which do not depart from the spirit and scope of the invention as disclosed in the appended claims.

I claim:

1. The method of making ball retainers consisting of forming two flat rings with substantially annular portions concentric with the center of said ring and with wider intermediate portions curved both inwardly and outwardly from said concentric portions, pressing said intermediate portions into hemispherical form on one side of the concentric portions which lie in substantially the same plane, trimming an edge of each of said rings to substantially a true circle, and uniting said rings to form a retainer for balls.

2. The method of making ball retainers consisting of forming two flat rings with substantially annular portions concentric with the center of each ring and with wider

intermediate portions curved both inwardly and outwardly from said concentric portions, pressing said intermediate portions into hemispherical form on one side of the concentric portions which lie in substantially the same plane, trimming an edge of each of said rings to substantially a true circle, and uniting said rings to form a retainer for balls, one ring being trimmed on the inside, the other on the outside so that the axis of each ball pocket will lie at an angle to the axis of the retainer.

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