G. F. FOWLER.

ELASTIC BEARING FOR CENTRIFUGAL MACHINES.

APPLICATION FILED MAR. 4, 1911.

1,126,971. Patented Feb. 2, 1915.

Fig. 1.

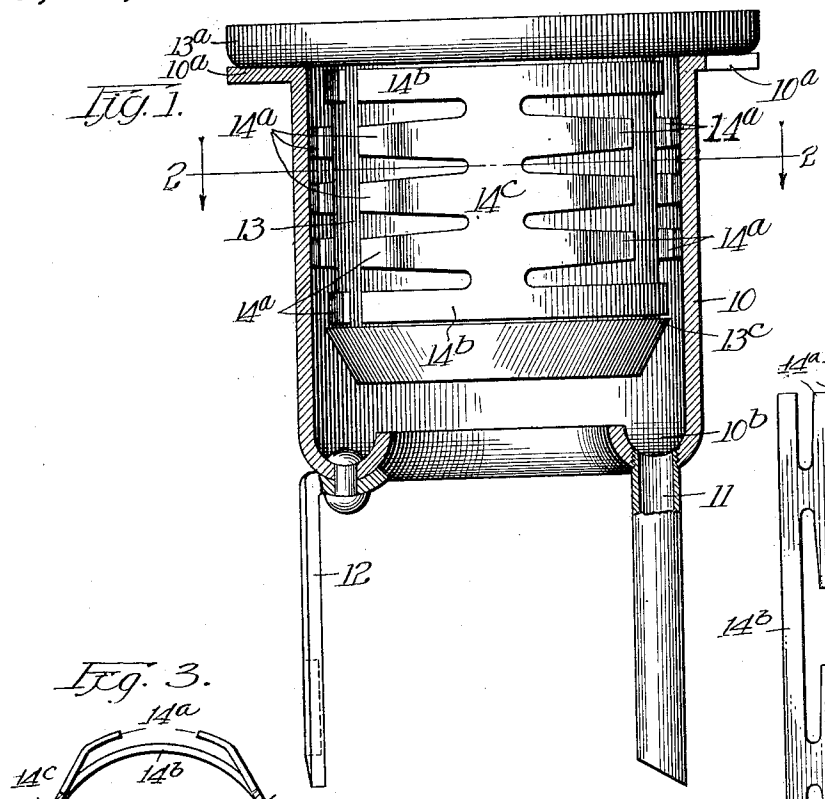


Fig. 4.

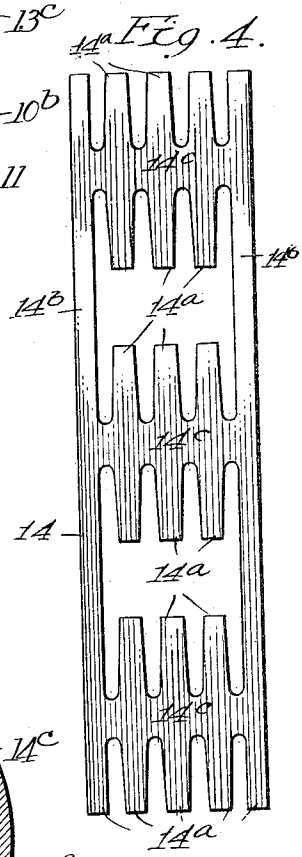


Fig. 3.

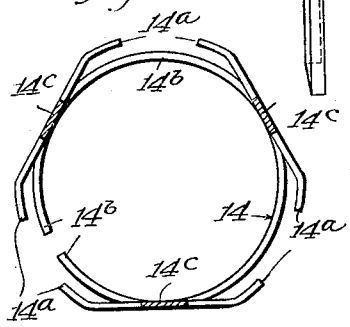
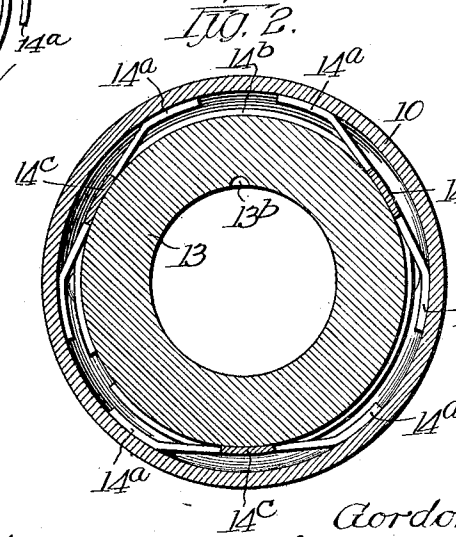


Fig. 2.



Witnesses:
Robert H. Weir
H. L. Brinker.

Inventor:
Gordon F. Fowler by
Brown Hopkins
Attys.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

GORDON F. FOWLER, OF OAK PARK, ILLINOIS, ASSIGNOR TO SEARS, ROEBUCK & COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF NEW YORK.

ELASTIC BEARING FOR CENTRIFUGAL MACHINES.

1,126,971. Specification of Letters Patent. Patented Feb. 2, 1915.

Application filed March 4, 1911. Serial No. 612,173.

To all whom it may concern:

Be it known that I, GORDON F. FOWLER, a citizen of the United States, residing at Oak Park, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Elastic Bearings for Centrifugal Machines, of which the following is a full, clear, and exact specification.

The invention relates to bearings or supports for rotatably supporting the rapidly rotating bowls of centrifugal machines, and is particularly adapted for what is known as the upper spindle bearing for the bowl spindles of centrifugal cream separators which are usually journaled for rotation on a vertical axis in the frame of the machine.

The primary object of the invention is to produce a bearing of the described character which will be simple and cheap in construction, easy to assemble, and which shall be efficient in elastically supporting the upper spindle bearing and preventing any binding or injury to the bowl or the spindle while in operation.

To the attainment of these ends and the accomplishment of certain other new and useful objects which will appear, the invention consists in the features of novelty hereinafter described in detail, shown in the accompanying drawings forming a part of this specification, and finally pointed out more specifically in the appended claims.

In the said drawings,—Figure 1 is a view in side elevation of the preferred form of the elastic bearing, the supporting cup for containing the bearing and supporting it in relation to the main frame of the machine being shown in vertical section. Fig. 2 is a horizontal section through the device taken on the line 2, 2 of Fig. 1, looking in the direction indicated by the arrows. Fig. 3 is a detail plan view of the elastic bearing support or spring as stamped from a flat sheet of metal before being given the cylindrical form necessary to surround the bearing. Fig. 4 is a horizontal sectional view of the spring similar to the view of the same shown in Fig. 2, with parts other than the spring omitted.

The reference character 10 indicates a common form of cup or support for an elastic gearing, the same being formed with an outwardly extending peripheral flange around the top thereof, indicated by 10^a, and provided with an interior channel or groove at the bottom thereof as at 10^b for catching lubricant from the bearing and directing the same through the outlet or tube 11 to gears or other mechanism below.

12 is a foot secured to the bottom of the cup adapted to position the same in relation to the main frame.

The bearing block is indicated by the reference character 13 and as usually arranged is of any desired and suitable frictional material for supporting the bowl spindle, usually at a point near its upper extremity where it joins with the bowl, being provided around the top with a laterally extending peripheral flange 13^a adapted to rest upon the top of the peripheral flange 10^a of the cup which supports it in relation to the main frame. The bearing block 13 is formed with a central vertically extending opening adapted to receive and support the bowl spindle, and has preferably on its interior surface a suitable groove as indicated at 13^b to retain and distribute lubricant. The bottom of the bearing block 13 is preferably formed with a peripheral flange as indicated at 13^c, which has its greatest diameter greater than the common diameter of the bearing for the purpose of retaining the elastic member or spring when placed in position around the bearing block between this lower flange 13^c and the upper flange 13^a.

In order to enable the spring to be readily placed in position around the bearing block 13, the bottom flange 13^c preferably has its walls given a conical shape converging downwardly as shown in Fig. 1. For the purpose of elastically positioning the bearing block 13 in relation to the supporting cup 10 and the frame of the machine, the elastic spring member 14 provided with the integrally formed tangential spring fingers 14^a is placed in position surrounding the bearing block and between the same and the interior wall of the cup, the preferred form of this elastic member being illustrated most clearly in Figs. 3 and 4, it being preferably formed from a single sheet of suitable spring metal, and consists essentially of upper and lower circumferential bands as indicated at 14^b, joined at intervals by the vertical cross connections 14^c carrying the integral spring fingers 14^a which project from each side thereof hori-

zontally and tangentially from the outer periphery of the spring when formed in a coil to surround the bearing block 13.

The extreme outer ends of the fingers 14[a] are preferably given a slight inclination or bend in order that they may contact for a certain portion of their length near their outer extremities with the interior wall of the cup 10 when the bearing is in position within the cup, as shown in Figs. 2 and 4. When the elastic member is formed as illustrated in Figs. 1 and 4 inclusive, and the spring is given the desired cylindrical form or coil, it will be seen that the top and bottom connecting bands 14[b] will closely encircle the periphery of the bearing block 13, while the deflected ends of the fingers 14[a] will bear against the interior walls of the cup 10. These fingers may be formed outwardly at any desired angle in order to insure that they shall be under any desired tension and the elasticity of the bearing may be determined by the number and size of the elastic fingers and the thickness and character of material employed in making this cylindrical elastic member. This form of elastic bearing is found to be very efficient in elastically supporting the vertical spindle and its bowl, the superior elasticity of the bearing being largely due to the number and character of the spring fingers formed on the integral cylindrical elastic strip.

It will be noted that in the various forms of the invention illustrated in the drawings, the elastic fingers are all shown spaced apart from each other and from the connecting bands joining the longitudinally extending pieces, and that these elastic fingers are all formed with a widened base where they join the body piece of the metal from which they are formed. This is an important feature of the invention, as the fingers are thus strengthened at their weakest point.

In order that the invention might be understood the details of the preferred embodiment thereof have been thus specifically described, but it will be apparent that there may be further modifications of the invention without departing from the purpose and scope of the invention, and it is not desired to be limited to the exact forms herein shown.

I claim:

1. In an elastic bearing for centrifugal machines, the combination with a stationary support, of a movable bearing block adapted to encircle and support a rotatable spindle, and an elastic member interposed between said bearing block and the said stationary support, said elastic member comprising a plurality of connecting pieces extending longitudinally of the axis of the bearing, being joined together by an integral connecting band and having a plurality of integral fingers formed thereon, and extending in opposite directions from each side thereof approximately at right angles thereto.

2. In an elastic bearing for centrifugal machines, the combination with a stationary support, of a movable bearing block adapted to encircle and support a rotatable spindle, and an elastic member interposed between said bearing block and the said stationary support, said elastic member comprising a plurality of connecting pieces extending longitudinally of the axis of the bearing, being joined together by integral connecting bands and having a plurality of integral fingers formed thereon and extending in opposite directions from each side thereof approximately at right angles thereto, said fingers being deflected for a portion of their length out of the plane of said connecting bands and said longitudinally connecting pieces.

3. In an elastic bearing for centrifugal machines, the combination with a stationary support, of a movable bearing block adapted to encircle and support a rotatable spindle, and an elastic member interposed between said bearing block and the said stationary support, said elastic member comprising a plurality of connecting pieces extending longitudinally of the axis of the bearing, being joined together by integral connecting bands and having a plurality of integral fingers formed thereon and extending in opposite directions from each side thereof approximately at right angles thereto, and being deflected for a portion of their length intermediate their extremities out of the plane of the said connecting band and said longitudinally extending connecting pieces, the outer extremities of said fingers remote from their points of securement to the said longitudinally extending connecting pieces being deflected to lie in a plane parallel to said connecting pieces and said band.

4. In an elastic bearing for centrifugal machines, the combination with a stationary support, of a movable bearing block adapted to encircle and support a rotatable spindle, and an elastic member interposed between the said bearing block and the said stationary support, said elastic member comprising a plurality of connecting pieces extending longitudinally of the axis of the bearing, being joined together by an integral connecting band and having a plurality of integral fingers formed thereon, said fingers being spaced apart from each other and from said connecting band with open spaces therebetween and between said fingers and said connecting band, and extending approximately at right angles to said longitudinally extending connecting

pieces, said fingers being formed with portions at their bases where they are joined to the said longitudinally extending connecting pieces, of an increased width over the body portions of the fingers.

5. In an elastic bearing for centrifugal machines, the combination with a stationary support, of a movable bearing block adapted to encircle and support a rotatable spindle, and an elastic member interposed between said bearing block and the said stationary support, said elastic member comprising a plurality of connecting pieces extending longitudinally of the axis of the bearing, being joined together by an integral connecting band and having a plurality of integral fingers formed thereon, and extending in opposite directions from each side thereof at an angle thereto.

6. In an elastic bearing for centrifugal machines, the combination with a stationary support, of a movable bearing block adapted to encircle and support a rotatable spindle, and an elastic member interposed between said bearing block and the said stationary support, said elastic member comprising a plurality of connecting pieces extending longitudinally of the axis of the bearing, being joined together by integral connecting bands and having a plurality of integral fingers formed thereon and extending in opposite directions from each side thereof at an angle thereto, said fingers being deflected for a portion of their length out of the plane of said connecting bands and said longitudinally connecting pieces.

7. In an elastic bearing for centrifugal machines, the combination with a stationary support, of a movable bearing block adapted to encircle and support a rotatable spindle, and an elastic member interposed between said bearing block and the said stationary support, said elastic member comprising a plurality of connecting pieces extending longitudinally of the axis of the bearing, being joined together by integral connecting bands and having a plurality of integral fingers formed thereon, and extending in opposite directions from each side thereof at an angle thereto, and being deflected for a portion of their length intermediate their extremities out of the plane of the said connecting band and said longitudinally extending connecting pieces, the outer extremities of said fingers remote from their points of securement to the said longitudinally extending connecting pieces being deflected to lie in a plane parallel to said connecting pieces and said band.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 1st day of March, A. D. 1911.

GORDON F. FOWLER.

Witnesses:

CHARLES H. SEEM,

A. L. SPRINKLE.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."