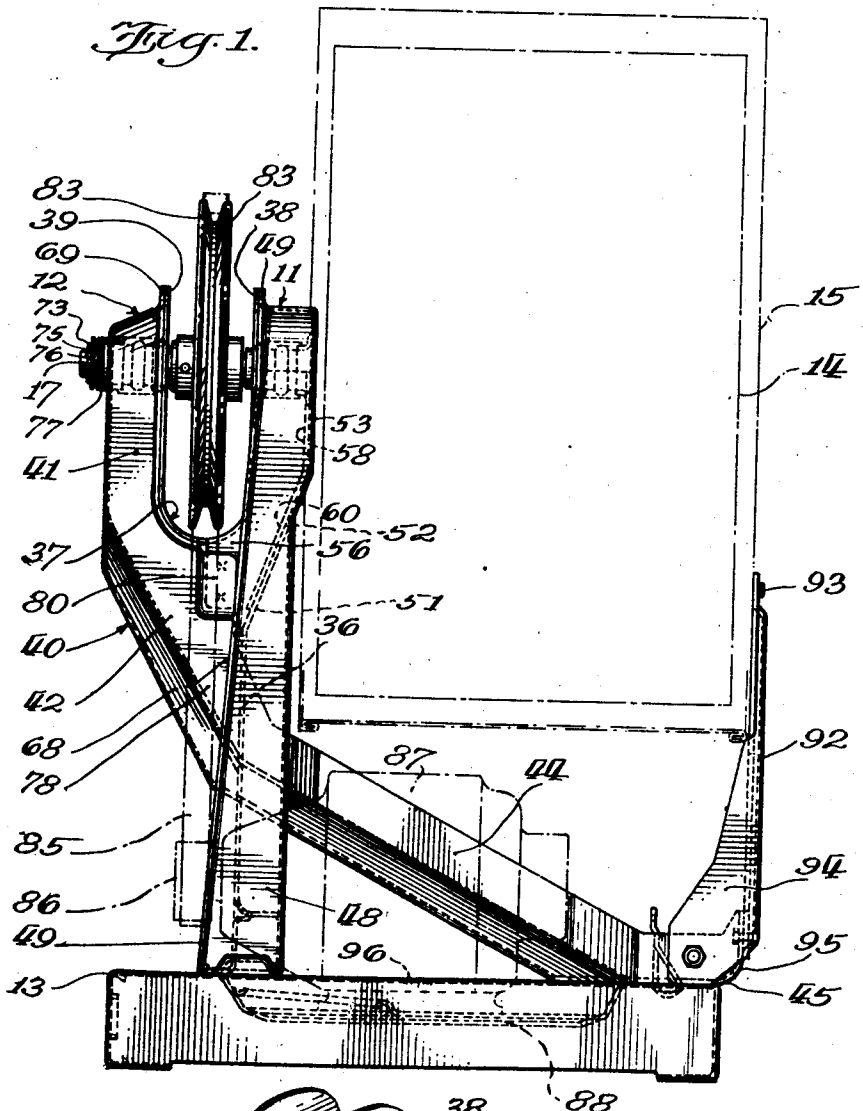
Feb. 13, 1940. A. O. McCOLLUM ET AL 2,190,455

SUPPORT FOR CENTRIFUGES

Original Filed April 9, 1937 4 Sheets-Sheet 1

Fig. 1.



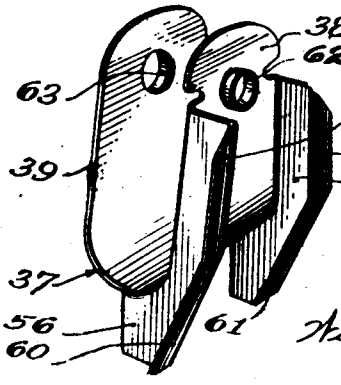


Fig. 4.

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SUPPORT FOR CENTRIFUGES

Original Filed April 9, 1937 4 Sheets-Sheet 2

Fig. 2.

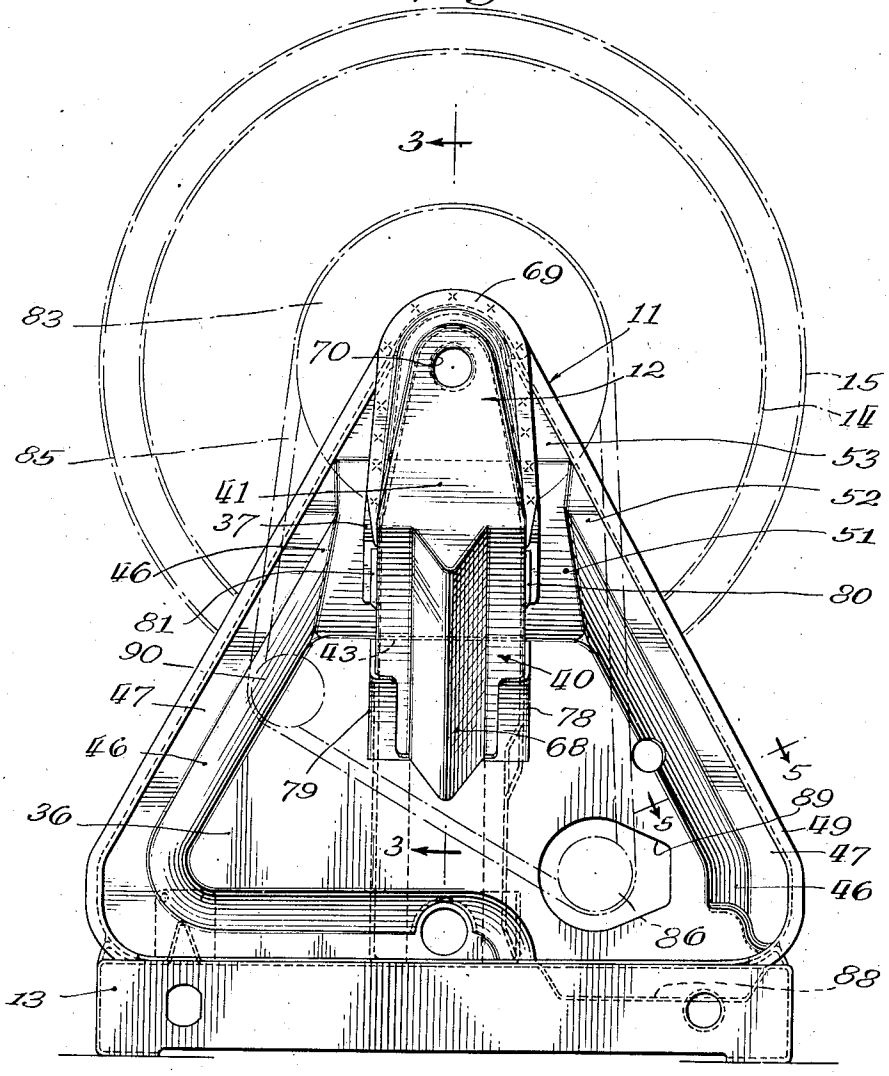
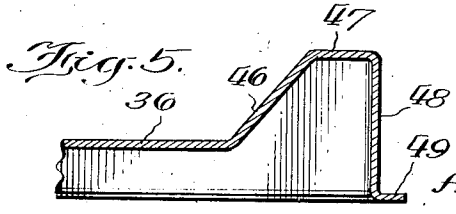


Fig. 5.



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SUPPORT FOR CENTRIFUGES

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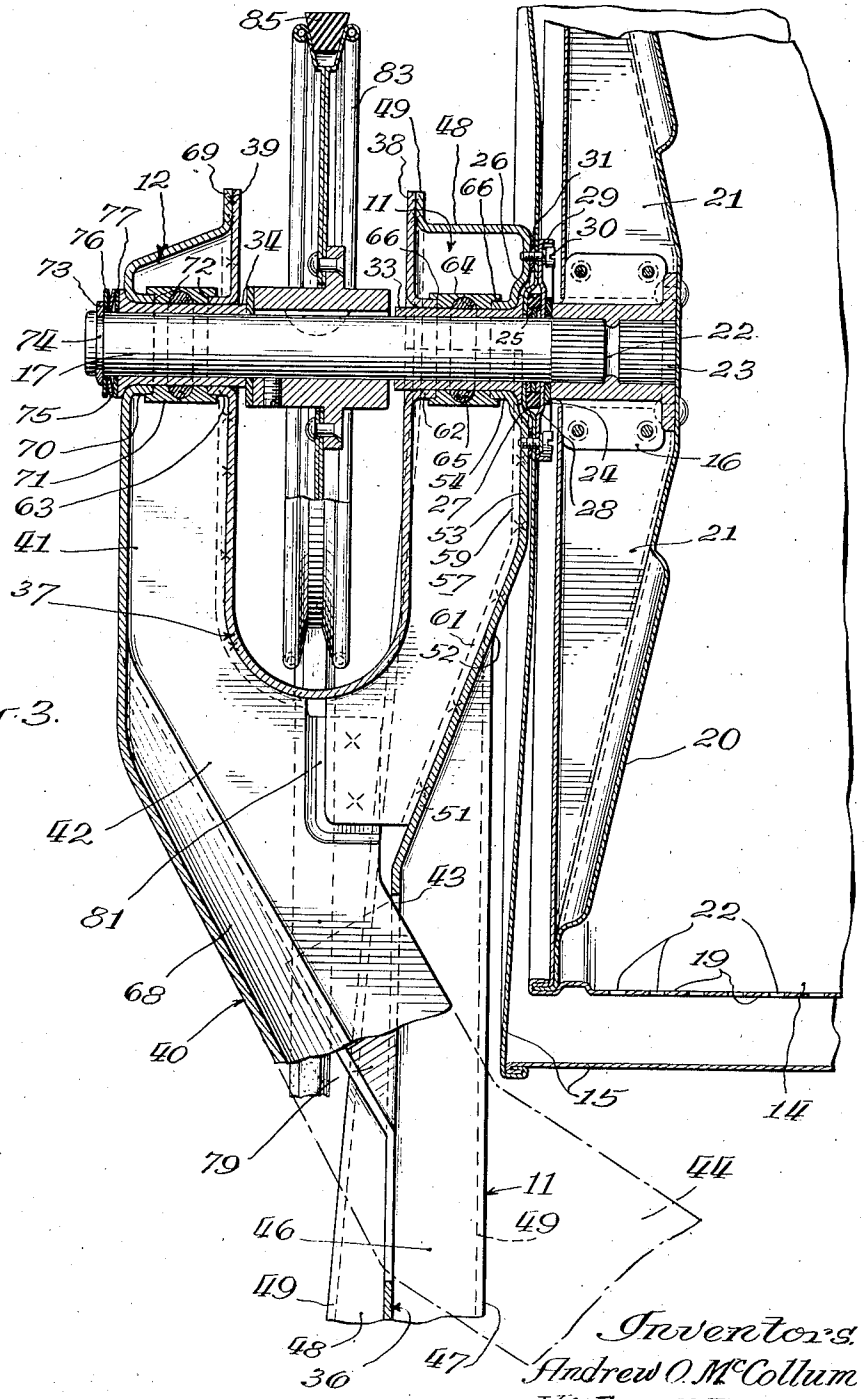


Fig. 3.

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SUPPORT FOR CENTRIFUGES

Original Filed April 9, 1937 4 Sheets-Sheet 4

Fig. 7.

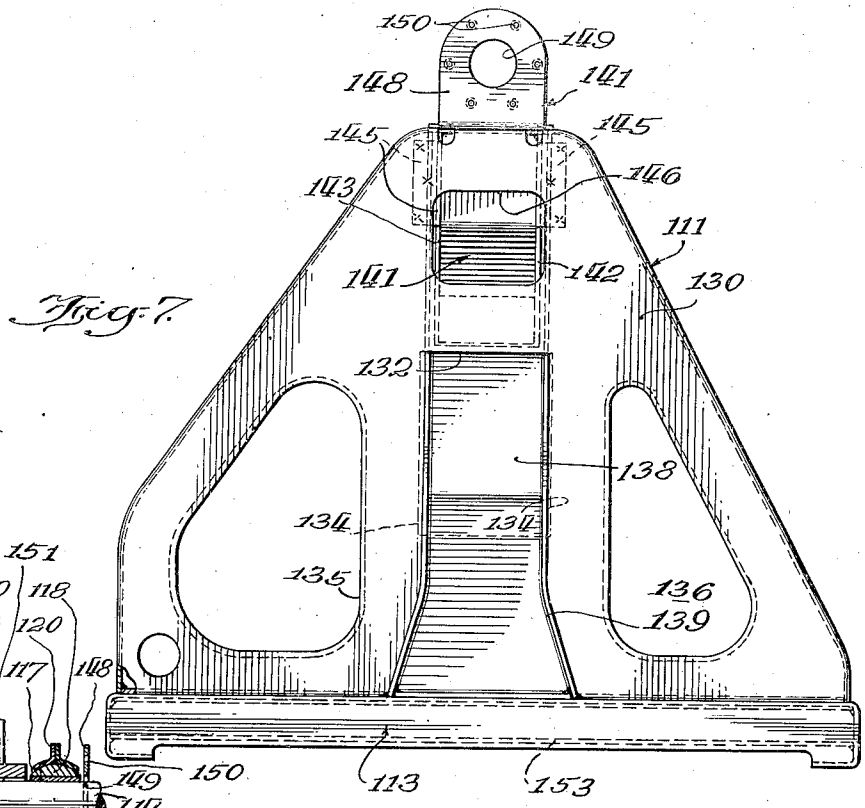
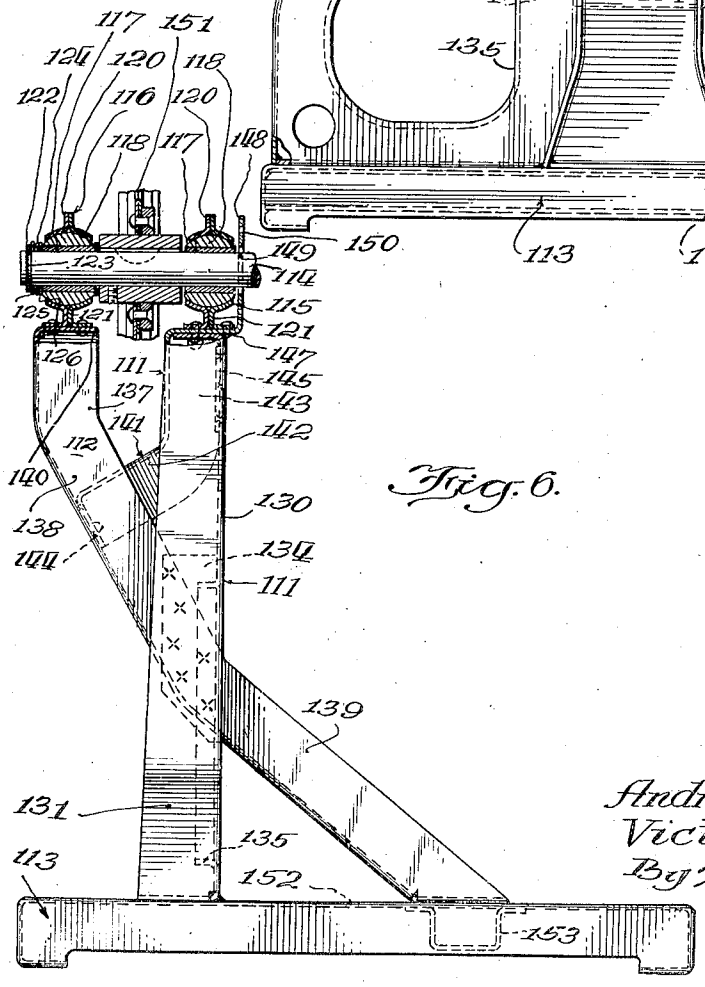


Fig. 6.



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UNITED STATES PATENT OFFICE

2,190,455

SUPPORT FOR CENTRIFUGES

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Application April 9, 1937, Serial No. 135,954
Renewed August 21, 1939

14 Claims. (Cl. 210—63)

The present invention relates to a support for a centrifuge and particularly to a support for a centrifuge such as a centrifugal extractor having a rotatable cylinder adapted to contain textiles from which liquid is to be extracted.

It is a well known fact that unbalance of a rotating body causes vibrations which may be of an amplitude such that if continued over a period of time the supporting framework eventually would be destroyed. Rotating bodies whose weight remains fixed may be balanced by well known methods to eliminate undesired vibrations, but where the rotating body carries variable loads, such, for instance, as the rotating cylinder of a centrifugal extractor, the degree of unbalance may vary considerably. The even distribution within the cylinder of textiles or other materials, from which liquid is to be extracted, necessary to eliminate all vibration, is not practicable because such distribution is difficult to attain as well as time consuming. Automatic balancing means have been suggested but, because of the nature of the complicated mechanism required, these are quite expensive.

It is the primary object of the present invention to provide a new and improved substantially rigid supporting means for a centrifuge rotatable about a horizontal axis.

A further object of the invention is to provide a new and improved supporting means for a centrifuge secured to one end of a relatively short shaft journaled in a pair of spaced-apart bearings, comprising a support for the bearing nearest the centrifuge constructed to withstand forces in a plane perpendicular to the axis of rotation and a second support constructed also to resist forces in a plane perpendicular to the axis of rotation and adapted particularly to prevent undue gyratory motion of the shaft.

The support of the present invention comprises, in brief, a base, an apertured support mounted thereon having a substantially triangular shape supporting at its upper end the bearing nearest the centrifuge and providing lever arms of sufficient length on either side of the center line of the shaft to withstand forces in a plane perpendicular to the axis of rotation created by rotation of the centrifuge, and a support for the rear bearing secured to the first mentioned support and extending diagonally downward through the aperture therein to a point of attachment on said base below the end of the centrifuge farthest from the bearings.

Other advantages and objects of the present invention will become apparent from the ensuing description of a centrifugal extractor embodying a preferred form and a modification of the support. These specific embodiments and description thereof are merely for the purpose of disclosing illustrative embodiments of the invention, and not to impose limitations on the claims.

In the accompanying description reference will be had to the drawings, in which:

Fig. 1 is a side elevation of the support, with the centrifuge and driving means therefor shown in phantom;

Fig. 2 is a rear elevation of the apparatus shown in Fig. 1;

Fig. 3 is a partial vertical cross-section view taken along the line 3—3 of Fig. 2, and shows in detail the assembly of the bearing support;

Fig. 4 is a perspective view, showing the details of a portion of the support;

Fig. 5 is a partial cross-section view, taken along the line 5—5 of Fig. 2;

Fig. 6 is a side elevational view, partially in section, of a modified form of support embodying the present invention; and

Fig. 7 is a front elevation of the support shown in Fig. 6.

The supporting means of the present invention comprises a front bearing support 11, a rear bearing support 12, both mounted upon a base 13, and assembled in a manner to be described fully hereinafter to form a rigid support for a centrifuge 14 mounted for rotation on a horizontal axis. The centrifuge 14 is illustrated as a cylinder forming the rotating part of a washing apparatus, but it should be apparent to those skilled in the art that the invention is not limited to this specifically illustrated embodiment. The cylinder is surrounded by a stationary casing 15, and is secured to a hub 16 of zinc, cast on the end of a horizontally disposed shaft 17 that is mounted in cantilever fashion for rotation in the bearing supports 11 and 12.

From Fig. 1 it may be seen that the shaft 17 is relatively short as compared to the length of the cylinder and that it is located above the rear end of the base 13 at a height approximately equal to the diameter of the cylinder. The rear bearing 12 is substantially above the rear end of the base 13 while the front bearing 11 is spaced forward therefrom about one-quarter of the length of the base. The front end of the cylinder 14 is substantially over the front end of the base.

Referring particularly to Fig. 3, it may be seen that the cylinder 14, the particular construction of which forms no part of this invention, com-

prises a center panel 19 and a rear panel 20 (the front panel not being shown), mounted upon a plurality of spokes 21, suitably attached to the hub 16. The cylinder is provided with peripheral perforations 22, in accordance with well known principles of liquid extraction.

The hub 16 is secured to shaft 17 against longitudinal and rotative displacement by annular groove 22 and longitudinal knurling 23, respectively. It is prevented from wearing against the casing 15 by a thrust washer 24. Leakage of liquid along the shaft from within the casing 15 is prevented by a plurality of flexible sealing rings 25, bearing tightly against the shaft and confined by an annular resilient rubber ring 26, to which they are bonded.

The sealing means is held in place between an annular, recessed shoulder 27, formed on casing 15, and a similar opposing shoulder 28 formed on an annular retaining ring 29. The casing 15 and retaining ring 29 are secured to the front bearing support 11 by a plurality of bolts 30. An annular packing strip 31 is interposed between the casing 15 and support 11, in order to provide a slightly resilient connection between these two members and at the same time to provide a liquid-tight seal around the holes through which bolts 30 pass.

The shaft is journaled for rotation in a pair of spaced-apart self-oiling bearings 33 and 34, mounted in the front and rear bearing supports 11 and 12, respectively. The details of the bearing mounting are clearly shown in Fig. 3, but before proceeding with the description of these details, it may be well to point out the features of the supports themselves.

Referring particularly to Figs. 1 and 2, it may be noted that the supporting members are formed of comparatively thin steel stampings, suitably formed and welded together to provide an integral, substantially rigid support for the rotatable cylinder 14. The particular construction of the supports from stampings welded together in the manner to be described hereinafter and the method of mounting the bearings thereon form no part of the present invention, but are disclosed and claimed in the copending application of Albert H. Haberstump, Serial No. 135,955, filed April 9, 1937.

The front bearing support 11 is made of a substantially triangular stamping 36 and a substantially U-shaped stamping 37, having a pair of legs 38 and 39, of which the former is welded to member 36 in a manner to be described specifically below.

The triangular stamping 36 has a sufficient width at the base, to which it is fixedly secured by welding, to provide lever arms of sufficient length on either side of the center line of cylinder shaft 17 to withstand forces in a plane perpendicular to the rotation of cylinder 14 when the latter is rotated at high speeds, and particularly when the textiles contained therein are not evenly distributed.

The rear bearing support 12 is made of a stamping 40 having a substantially U-shaped cross-section and provided with an upper vertical portion 41 welded to leg 39 of the U-shaped intermediate member 37. The stamping 40 is relatively narrow and lies substantially in a plane passing vertically through the axis of rotation of shaft 17. At the level of the bottom of the U-shaped intermediate member 37 the supporting member 40 is inclined toward the inner bearing support 11 as indicated at 42. This inclined portion passes through a central aperture 43 formed in member 36 and thence diagonally downwardly below the stationary casing 15, as indicated at 44, to a point of attachment to the base. The point of attachment is substantially directly below that end of cylinder 14 farthest removed from the bearings.

The three members 36, 37 and 40 from which the bearing support is fabricated are formed to provide a rigid, well braced structure. They are formed with complementary flanges providing additional rigidity as well as a convenient means for securing the parts together in a suitable manner, such as welding.

The triangular member 36 is provided with a peripheral U-shaped channel consisting of an inclined portion 46 extending toward the centrifuge (away from the reader as viewed in Figs. 2 and 5), a flat portion 47 lying in a line parallel to the central portion, and a peripheral portion 48 lying at right angles to the central portion and provided with a flange 49.

The intermediate central portion 51 of member 36 is inclined upward and toward the centrifuge to meet portion 47 of the channel, as indicated by reference numeral 52. The two portions then extend backward and upward at the same angle and terminate in an upper vertical portion 53 joining the peripheral portion 48. The upper vertically extending portion 53 is perforated and provided with an annular inturned flange 54 for the purpose that will appear shortly.

The form of the U-shaped intermediate member 37 is clearly disclosed in Fig. 4 and consists of legs 38 and 39, the former of which is provided with projections 56 and 57 extending downward and outward at right angles thereto. The latter in turn are provided with right angle flanges, having vertical portions 58 and 59 and inclined portions 60 and 61, respectively. Legs 38 and 39 are provided with apertures having flanges 62 and 63 extending in opposite directions from the respective legs.

Referring now more particularly to Figs. 1, 2 and 3, it may be seen that complementary portions on the U-shaped intermediate and triangular members are provided by (1) the upper end of leg 38 and flange 49, (2) vertically extending flanges 58 and 59 and the vertically extending portion 53, and (3) inclined flanges 60 and 61 and the inclined portion 51.

Before the above portions are secured together, a bearing sleeve 64, provided with an annular ring of oil-containing compound 65 and annular internal shoulders 66 at its ends for the reception of the oppositely disposed flanges 54 and 62, is inserted therebetween. Thereafter the complementary portions are welded together to form a unitary rigid front bearing support capable of resisting substantially all forces in a plane passing therethrough at an angle substantially perpendicular to the axis of rotation.

Similar complementary portions are provided on leg 39 of the U-shaped member and the diagonal member 40 forming the rear bearing support. The latter is given considerable rigidity by a V-shaped channel 68 formed substantially centrally thereof on the inclined portions 42 and 44. The opposite parallel sides of the vertical portion 41 of member 40 are provided with a transverse flange 69 having a shape corresponding to that of leg 39 of the U-shaped member so that these two parts may be secured to each other by welding. The vertical portion 41 is likewise provided with an aperture

having an inturned flange 70 extending toward flange 63. Between these flanges is a second bearing sleeve 71, similar in all respects to sleeve 64, having opposite inner annular shoulders 72 into which the flanges extend securely to hold the bearing sleeve in place.

Longitudinal movement of the shaft in the bearings is prevented by a C washer 73 positioned in a groove 74 formed at the end of shaft 17. A resilient movement-restraining means for the shaft is provided by a spring washer 75 held between washers 76 and 77, one of which abuts against the rear bearing 34 and the other against the C washer.

In order to give the bearing support additional rigidity, the inclined diagonal member 40 is secured to flanges 56 and 57 formed on leg 38 of the intermediate U-shaped member and to inclined right-angled flanges 78 and 79 formed on the sides and bottom of the aperture 43. The lower portions of flanges 56 and 57 are secured to member 40 by welding them to rectangular ears 80 and 81 formed integral with the latter substantially directly below the curved portion of the intermediate member. The right-angled flanges 78 and 79 are formed with internal dimensions corresponding to the external dimensions of the U-shaped diagonal member 40 so that the latter nests therein near the point where it passes through or intersects the triangular member 36.

The above described construction provides a hollow, box-like bearing support capable of resisting forces set up by rotation of cylinder 14 when the distribution of textiles therein is such as to cause an unbalance thereof. The support is made of only three preformed members and requires but a slight amount of welding in its fabrication. The construction is such that the parts can be made and assembled very economically.

The cylinder shaft is rotated by means of a pulley 83 secured to the shaft intermediate the bearings 33 and 34. The pulley is rotated by a V belt 85 driven by a pulley 86 rotated by a motor 87 suitably mounted in a depressed portion 88 formed on base 13. The driving pulley 86 and motor 87 are located on opposite sides of the triangular supporting member 36, which is provided with a third aperture 89 through which the driving connection extends. This aperture is made sufficiently large to enable the motor 87 and driving pulley 86 to be removed for repairs or cleaning simply by releasing the belt and loosening the motor from the base.

It should be noted that the construction of the support is such that an endless belt 85 may be used since the belt does not have to be threaded through any of the parts comprising the support. The belt is maintained taut by a spring-biased idler pulley 90 of any suitable construction.

The front end of the stationary casing 15 is supported by an upstanding member 92 to which it may be secured, as by bolts 93. Member 92 is provided with integral tapered side arms or flanges 94 secured at their lower ends to the vertical sides of the U-shaped diagonal support 40. Member 92 is also secured to a curved end-closing portion 95 provided on support 40, thereby adding further to the rigidity of the support.

The apparatus described above may be secured to a floor or the like by means of a bolt (not shown) passing through a central opening 96 formed in the base 13. It has been found satisfactory to use only the single centrally located bolt, but it is obvious that a plurality of them may be used just as well.

The support itself has proved to be substantially rigid and, therefore, satisfactory in actual use and has carried eccentric loads at substantial speeds without the creation of destructive vibration. In operation the cylinder 14 is rotated at a desired speed by the motor 87, which may be energized from a suitable source of energy. When the load within the cylinder is evenly distributed, the cylinder rotates without creating appreciable forces tending to cause vibration. However, if the load within the cylinder is not evenly distributed, then the forces created may be substantial.

These forces tend to cause a shift in the axis of rotation whereby the shaft assumes a gyratory as well as a rotary motion. The front support, because of its vertical position and triangular shape, prevents radial movement of the shaft because of its ability to resist both vertically acting forces and side thrust. The rear support, being relatively narrow and constructed of relatively thin steel, flexes slightly and thereby permits the shaft to assume a gyratory motion. However, the rear support is sufficiently rigid to prevent undue gyratory motion. Thus, some of the forces created by rotation of an eccentric load are absorbed in the frame, whereby the stress placed upon the shaft is reduced. If the bearings were mounted in perfectly rigid supports, the shaft would be subjected to considerable stress and there would be greater likelihood of its crystallizing and breaking. However, by constructing the support in the manner described, the possibility of crystallization and breakage of the shaft is greatly reduced.

The casing 15 is not affected by the gyratory movement of the shaft because it is supported upon the front bearing support and the support 92, both of which are substantially rigid.

In practice the casing 15 and centrifuge are surrounded by a casing mounted on the base 13 and it, like the casing 15, remains substantially unaffected by the movement of the shaft and rear bearing support.

In the modification illustrated in Figs. 6 and 7, the support is fabricated in a somewhat simpler fashion. The support comprises a front bearing support 111 and a rear bearing support 112, both mounted on a base 113 and assembled to form a rigid support for a centrifuge (not shown) rotatable on a horizontal axis.

The centrifuge is driven by a shaft 114 journaled for rotation in a pair of spaced-apart self-aligning bearings 115 and 116 mounted on supports 111 and 112, respectively. The bearings are identical in construction and comprise bearing portions 117 through which the shaft extends. These bearing portions are mounted in sleeves 118 having spherical outer surfaces. The sleeves are mounted in standards 120 each comprising two halves secured together and formed with legs 121 suitably fastened to the tops of supports 111 and 112.

The shaft 114 is held against longitudinal movement by a C washer 122 positioned in a groove 123 formed at the end of shaft 114. A resilient movement-restraining means is provided by a spring washer 124 held between washers 125 and 126, one of which abuts against the rear bearing 117 and the other against the C washer.

The supports are formed of relatively thin steel stampings suitably formed and then welded to-

gether to form a rigid supporting structure. The front support 111 is made of a substantially triangular stamping 130 provided with a peripheral flange 131 extending at right angles therefrom in a direction away from the centrifuge. It is welded at its lower end to the base 113 in a position perpendicular to the axis of rotation of shaft 114.

The front support 130 is provided with a central aperture 132 provided with vertical side flanges 134 and flanged apertures 135 and 136 on opposite sides of aperture 132 to give the support additional rigidity.

The rear support 112 may be seen to consist of a relatively narrow U-shaped diagonal member lying substantially in a plane perpendicular to the base and passing through the axis of rotation of shaft 114. It comprises an upper vertical portion 137, an intermediate diagonal portion 138 extending through the central aperture 132 and a bottom diagonal portion 139 secured to the base at a point below the centrifuge. The upper end of the vertical portion 137 is closed at 140 to provide a flat surface for bearing 116.

The intermediate portion 138 of the rear support has its side walls welded to the flanges 134 formed on the vertical support 111 at the central aperture and is further connected to the support by a strut 141 connecting the two above the aperture. The strut consists of diagonal portion 142 lying at right angles to the intermediate portion 138 of the rear support and a vertical portion 143. These portions have substantially U-shaped cross-sections. The lower end of portion 141 is closed, as shown at 144, and securely welded to the rear support. The upper portion 143 has transverse flanges 145 formed thereon so that it may be securely welded to the vertical support 130. The latter is provided with an aperture 146 near its apex to facilitate welding of the closed end 144 of the strut to the rear support.

The vertical portion 143 of the strut 141 has a U-shaped cross-section up to the point where it abuts the upper end of flange 131. Thereafter the strut continues as a flat piece bent, first horizontally over the top of flange 131, as shown at 147, and then vertically, as shown at 148. The latter is provided with an opening 149 through which the shaft 114 extends and a plurality of openings 150 for bolts used to secure the stationary casing (not shown) of the washing machine.

The shaft is adapted to be rotated through a pulley 151 secured to shaft 114 intermediate the bearings 115 and 116.

The front support for the casing, corresponding to support 92 of the first modification, has been omitted from Figs. 6 and 7, but it is apparent that such a support may be secured to the front end of base 113.

The base 113 may be secured to a floor or other supporting structure by means of a bolt passing through a hole 152 located centrally of the base. Additional rigidity is given the base by a transverse channel member 153 extending across the sides and below the top thereof.

From the above description of the modified support it may be seen that it incorporates all the essential features of the present invention and, like the first described embodiment, forms a rigid support for the centrifuge.

While two embodiments of the invention have been described above, it should be apparent that the invention is adapted to be embodied in other specific constructions. Therefore, it should be understood the invention is not limited to the specific details illustrated in the drawings and described above and that the scope of the invention is limited solely by the following claims.

We claim:

1. Apparatus comprising a centrifuge having a shaft mounted for rotation about a substantially horizontal axis, in combination with a support including a base, a first member substantially triangular in shape and mounted in vertical position on said base and supporting said shaft at a point adjacent the centrifuge and a second member lying substantially in a vertical plane passing through the axis of rotation and extending diagonally downward between the inclined sides of said first mentioned member to said base and supporting said shaft at a point spaced farther from said centrifuge than the first mentioned point.

2. Apparatus comprising a centrifuge having a shaft mounted for rotation about a substantially horizontal axis, in combination with a support including a base, a first member mounted in a vertical position on said base and supporting said shaft at a point adjacent the centrifuge, said member being provided with a central aperture, and a second member lying substantially in a vertical plane passing through the axis of rotation and extending diagonally downward through said aperture to said base and supporting said shaft at a point spaced farther from said centrifuge than said first mentioned point.

3. Apparatus comprising a centrifuge having a shaft mounted for rotation about a substantially horizontal axis, in combination with a support including a base, a first member substantially triangular in shape and mounted in vertical position on said base and supporting said shaft at a point adjacent the centrifuge, and a second member lying substantially in a vertical plane passing through the axis of rotation and extending diagonally downward between the inclined sides of said first mentioned member to a point of attachment to the base and supporting said shaft at a point spaced farther from said centrifuge than the first mentioned point, said point of attachment of said second member with said base being located below the centrifuge.

4. Apparatus comprising a centrifuge of predetermined length and diameter, a shaft driving said centrifuge and mounted for rotation on a substantially horizontal axis, and a support including, in combination, a first member mounted in a vertical position on said base and supporting said shaft at a point adjacent the centrifuge, and a second member lying substantially in a vertical plane passing through the axis of rotation and extending diagonally downward between the sides of said first mentioned member to a point of attachment to the base and supporting said shaft at a point spaced farther from said centrifuge than said first mentioned point, said point of attachment of said second member with said base being located substantially below the front end of said centrifuge.

5. Apparatus comprising a centrifuge having a shaft mounted for rotation on a substantially horizontal axis, in combination with a support including a base, a first member mounted in a vertical position on said base and supporting said shaft at a point adjacent the centrifuge, said member being provided with a centrally located aperture, and a second member supporting said shaft at a point spaced farther from said centrifuge than the first mentioned point, said second

member lying substantially in a plane passing vertically through the axis of rotation and extending diagonally downward through said aperture to said base, and secured to said first member at said aperture and to said base.

6. Apparatus comprising a centrifuge having a shaft mounted for rotation on a substantially horizontal axis, in combination with a support including a base, a first member mounted in a vertical position on said base and supporting said shaft at a point adjacent the centrifuge, said member being provided with a centrally located flanged aperture, and a second substantially U-shaped member supporting said shaft at a point spaced farther from said centrifuge than the first mentioned point, said member lying substantially in a plane passing vertically through the axis of rotation and extending diagonally downward through said aperture to said base, said second member having its side walls secured to the flanged portion of the first member and its lower end to said base.

7. Apparatus comprising a centrifuge having a shaft mounted for rotation on a substantially horizontal axis, in combination with a support including a base, a first member mounted in a vertical position on said base and supporting said shaft at a point adjacent the centrifuge, said member being provided with a centrally located aperture, a second member lying substantially in a vertical plane passing through the axis of rotation and extending diagonally downward through the aperture in said first member to said base and supporting said shaft at a point spaced farther from said centrifuge than said first mentioned point, and a third member securing together the portions of the two first mentioned members extending above the aperture.

8. Apparatus comprising a centrifuge having a shaft mounted for rotation on a substantially horizontal axis, in combination with a support including a base, a first member mounted in a vertical position on said base and supporting said shaft at a point adjacent the centrifuge, said member being provided with a centrally located aperture, a second member supporting said shaft at a point spaced farther from said centrifuge than the first mentioned point, said second member lying substantially in a plane passing vertically through the axis of rotation and extending diagonally downward through said aperture to said base, said second member being secured to said first member at said aperture and to said base, and a third member for securing together the portions of the two first mentioned members extending above the aperture.

9. Apparatus comprising a centrifuge having a shaft mounted for rotation on a substantially horizontal axis, in combination with a support including a base, a first member mounted transversely to the axis of rotation and in vertical position on said base and supporting said shaft at a point adjacent the centrifuge, said member being provided with a centrally located aperture having flanged side walls, a second substantially U-shaped member supporting said shaft at a point spaced farther from said centrifuge than the first mentioned point, said member lying substantially in a plane passing vertically through the axis of rotation and extending diagonally downward through said aperture to said base, said second member having its side walls secured to the flanged portion of the first member and its lower end to said base, and a third member for securing together the portions of the two first mentioned members extending above the aperture, said third member having transverse flanges at each end thereof secured to first and second mentioned members respectively.

10. Apparatus comprising a centrifuge having a shaft mounted for rotation on a substantially horizontal axis, a pair of bearings for said shaft, and a support for said bearings including a base, a first member mounted transversely to the axis of rotation and in a vertical position on said base and supporting one of said bearings at a point adjacent the centrifuge, said member being provided with a centrally located aperture having flanged side walls, a relatively narrow substantially U-shaped member lying substantially in a plane passing vertically through the axis of rotation supporting the second of said bearings at a point spaced farther from said centrifuge than the first, said second member comprising a vertically extending portion supporting said bearing, an intermediate diagonal portion extending through said aperture and an end diagonal portion having its side walls secured to said intermediate portion having its side walls secured to said flanges and said end portion being secured to the base, and a third member for securing together the upper portion of the first member and the intermediate portion of the second, said member having a vertically extending portion provided with transverse flanges secured to said first mentioned member and a diagonal portion lying substantially at right angles to said intermediate portion and provided with a transverse flange secured to said intermediate portion.

11. Apparatus comprising a centrifuge having a shaft mounted for rotation on a substantially horizontal axis, in combination with a support for said shaft including a base, means including a member extending transversely to the axis of rotation and mounted vertically near the rear of said base and supporting said shaft adjacent the rear end of the centrifuge, and means including a relatively narrow member extending diagonally downward to the front of said base in a plane passing vertically through the axis of rotation and supporting the shaft at a distance farther from the rear of the centrifuge than said first mentioned member.

12. Apparatus comprising a centrifuge having a shaft by which it is rotated in combination with a support for the shaft including a first member substantially perpendicular to the axis of rotation mounted on said base and supporting said shaft adjacent the centrifuge, and a second member lying substantially in a plane passing through the axis of rotation and perpendicular to the base and extending diagonally downward between the sides of the first member to said base and supporting said shaft at a point spaced farther from the centrifuge than the first mentioned point.

13. Apparatus comprising a centrifuge having a shaft at one end, spaced-apart bearings for said shaft and means including a motor, a pulley on said shaft between said bearings, a pulley driven by the motor shaft and belt means for transmitting power from one pulley to the other, in combination with a support including a base, a member mounted substantially perpendicular to the base and supporting a bearing adjacent the centrifuge, said member being provided with a substantially centrally located aperture and with a second aperture located below and to one side of said first mentioned aperture, a second member extending vertically downward in spaced

relationship with said first member, then diagonally downward through said first mentioned aperture to the base and supporting the other of said pair of bearings, said motor being mounted on said base below and to one side of said centrifuge and having a driving connection to said second mentioned pulley extending through the second mentioned aperture.

14. Apparatus of the type described including, in combination, a base, a vertically extending apertured support mounted near the rear of said base carrying a shaft bearing, a second support secured to the front of said base and having an inclined portion passing through and another portion extending upward behind the first-mentioned support and carrying a second bearing aligned with the first, a third support extending upwardly at the front of said base, a stationary receptacle mounted between the first and third supports, a centrifuge within said receptacle having a shaft secured to and projecting from its end wall, said shaft being journaled in said bearings, and means for driving said shaft.

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VICTOR J. LOVETT.

CERTIFICATE OF CORRECTION.

Patent No. 2,190,455. February 13, 1940.

ANDREW O. McCOLLUM, ET AL.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 5, second column, line 22-23, for "por- stantially at right angles to said intermediate" read portion extending to said base, said intermediate; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 2nd day of April, A. D. 1940.

Henry Van Arsdale,
Acting Commissioner of Patents.

(Seal)