Aug. 6, 1929. H. J. M. C. KRANTZ 1,723,940

CENTRIFUGAL MACHINE

Filed Oct. 16, 1926

Fig. 1.

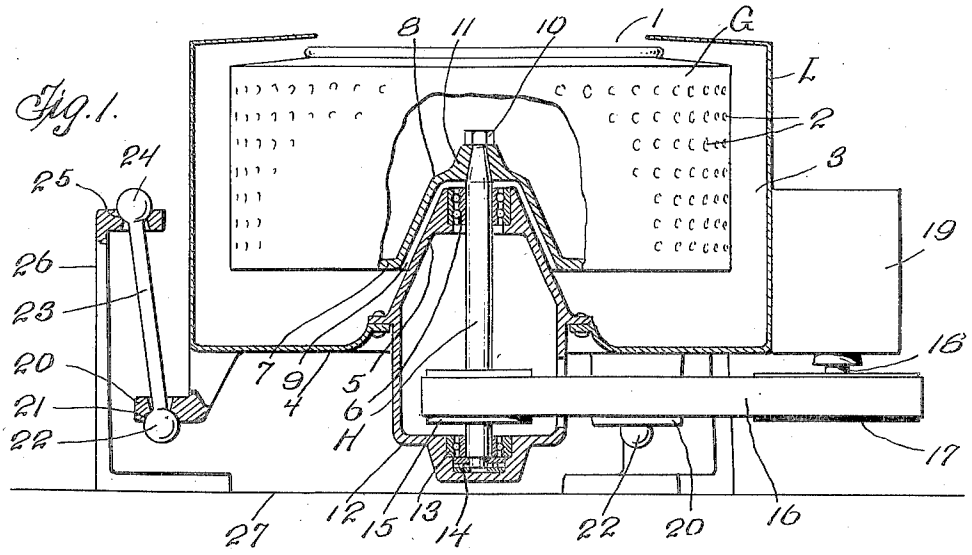
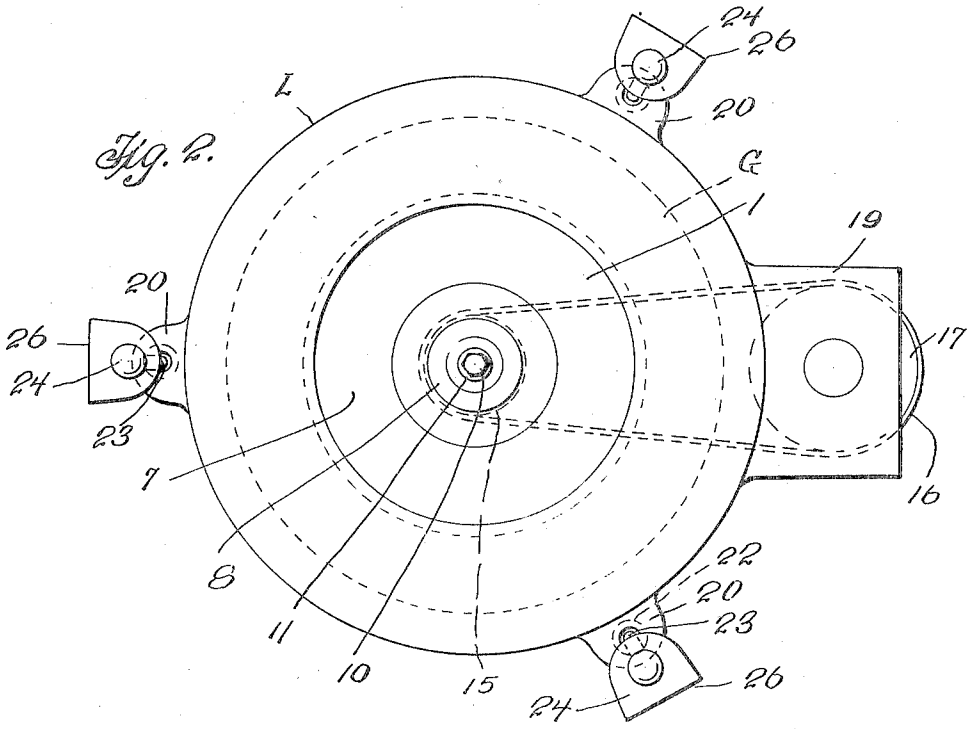


Fig. 2.



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UNITED STATES PATENT OFFICE.

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CENTRIFUGAL MACHINE.

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This invention relates to a centrifugal machine, and particularly to a machine adapted for the drying of clothes, textile materials, or other articles, by the action of centrifugal force, the articles to be dried being placed in a whirling basket so that the moisture is driven out therefrom by the centrifugal force generated by the rotation of the basket.

A particular object of the invention is to provide an improved mounting for the basket so that it may be driven at high speed, and so that the unavoidable vibration thereof due to its high speed of rotation may occur without undue injury to any of the parts, and so that the extent of the vibratory motion may be reduced.

Other objects and aims of the invention, more or less specific than those referred to above, will be in part obvious and in part pointed out in the course of the following description of the elements, combinations, arrangements of parts and applications of principles constituting the invention; and the scope of protection contemplated will be indicated in the appended claims.

In the accompanying drawings which are to be taken as a part of this specification, and in which I have shown merely a preferred form of embodiment of the invention:—

Fig. 1 is a vertical sectional view through a centrifugal machine constructed in accordance with this invention, parts being shown in side elevation, and

Fig 2 is a top plan view of the structure seen in Fig. 1.

Referring to the drawings for describing in detail the structure shown therein the reference character L indicates a main casing. This casing may be of any suitable construction and within it is arranged the basket G in the usual relation common to centrifugal machines of this general type. Both the casing and the basket are open at their upper sides as at 1 for the convenient insertion and removal of articles to be dried. The basket is formed with suitable perforations through its annular wall for instance as indicated by the reference character 2, and is somewhat smaller in diameter than the casing to provide an open space 3 into which the moisture from the articles within the basket may flow.

The central portion of the bottom wall 4 of the casing is projected upwardly as at 5 and provides a support for a ball-bearing device 6 at its upper end within which engages the main supporting shaft H of the basket.

The bottom wall 7 of the basket has its central portion projected upwardly as at 8 so as to provide a downwardly opening recess as 9 centrally of the under-side of the basket into which the upwardly projecting portion 5 of the casing projects. The bearing 6 is thus disposed in a plane above the bottom of the basket.

The shaft H projects above the bearing 6 and is rigidly connected as at 10 to a hub portion 11 provided at the upper end of the portion 8 of the basket.

The central portion of the bottom wall 4 of the casing has another portion which is projected downwardly as at 12 and provides a support for a ball-bearing device 13 at its lower end within which engages the lower end portion of the main supporting shaft H. The portion 12 provides also proper support for an end thrust bearing 14 at the lower end of the shaft H.

Upon the shaft H is mounted a pulley 15 about which engages an endless belt 16 extending horizontally and engaging about a drive pulley 17 which is carried upon the shaft 18 of a motor 19.

The motor 19 is carried by the casing L.

In order to support the casing L said casing is provided with a plurality of laterally extending lugs as 20 thereon, there being three such lugs in the structure illustrated and being spaced equi-distant circumferentially of the casing. Each of these lugs is shaped to provide in its under-surface a ball seat 21 within which engages a ball 22 carried at the lower end of a hanger link 23. The upper ends of these links 23 are provided with similar balls as 24 arranged to engage within ball seats 25 which are provided in the upper surfaces of suitable bracket members 26, said bracket members being in turn rigidly supported upon the main supporting floor 27.

It will be apparent from this arrangement that the casing L, including the basket and its driving means, will be free to vibrate upon the hanger links 23 without imparting any appreciable portion of said vibration to the floor 27.

It is also important to note that due to

the unitary construction of the casing and the motor 19 the vibratory motions of the casing will be partaken of by the motor and hence will at no time alter the distance between the pulleys 15 and 17. The driving efficiency of the motor, through belt 16 will thus not be impaired.

It will be apparent that on account of the fact that the basket is fixed to shaft H in close proximity to the bearing 6 said bearing will be most directly and strongly effective by the vibratory motions of the basket. In placing articles into the basket for drying it is impractical and practically impossible to dispose them in precise concentric relation, with regard to their weight, about the shaft H, and hence the rotation of the basket is inevitably accompanied by a certain amount of eccentric movement, herein and usually referred to as vibration.

In order to meet this situation, and in addition to the means already described for accommodating and absorbing the vibration, the present invention includes means tending to prevent the generation of excessive vibration. This means consists of positioning the bearing 6 as nearly as possible at the centre of gravity of the basket and in so shaping the basket that the placing therein of articles to be dried will not be likely to materially alter the position of the centre of gravity of the rotating mass. To this end the bearing 6 is sufficiently elevated above the bottom wall 7 of the basket so that, considering the weight of the various parts of the basket and its general form, it occupies a position substantially at the centre of gravity of the basket.

Any sidewise vibration of the rotating mass, as by non-concentric disposition of the articles to be dried or otherwise, will be felt by said bearing only as a lateral strain upon said bearing and will be transmitted directly through said bearing to the casing L which will thus vibrate upon the hanger links 23 in substantial perfect unison with the basket. Strains tending to incline the shaft H out of its true vertical position will be practically eliminated and the bearing 6 will thus have a materially greater life, with consequent reduced wear upon all parts of the mechanism.

It is important to note in this connection that the bearing 6 is one of a pair of bearings by which the shaft H is mounted to resist the vibratory action of the basket. The bearing 13 at the lower end of the shaft is carried by the casing and engages the shaft at a point spaced a considerable distance from the bearing 6 so that it provides a decided steadying effect upon said shaft to efficiently overcome any strains which may tend to incline the shaft from its true vertical position as for instance when the articles being dried are so carelessly arranged within the basket as to greatly increase the preponderance of weight at one side of the shaft, and particularly if the preponderance is so far above or below the horizontal plane of the centre of gravity in the bearing 6 as to tend to tip the basket laterally during its rotation.

The space between the two bearings 6 and 13 is admirably adapted to accommodate the pulley 15 by which the shaft is driven from the motor 19, it being noted in this connection that whereas the bearing 6 is positioned to sustain the major part of the lateral strains directly imparted to the shaft by the rapidly rotating basket the bearing 13 is positioned in close proximity to the pulley 15 so that it sustains the major part of the lateral strains imparted to the shaft by the belt 16. Thus, while both bearings co-operate in supporting the basket and in supporting the pulley yet each is particularly adapted to a particular task.

The hanger links 23 are preferably disposed at a slight incline with their upper ends further spaced from the centre of casing L than their lower ends. The several hanger links are thus adapted to impart a decided centering effect upon the casing each tending to draw the casing in its respective radial direction so that the vibratory motions of the casing are thus materially dampened as will be readily understood.

It has been found also that by placing the supporting ball seats 25 for the upper ends of the hanger links at approximately the horizontal plane of the centre of gravity of the basket, as illustrated, a more efficient dampening effect is obtained.

As many changes could be made in this construction without departing from the scope of the invention as defined in the following claim, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative only and not in a limiting sense.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:—

A centrifugal machine comprising a rotatable basket, a casing for said basket, a support for said casing consisting of a plurality of stationary bearings spaced about the casing, lugs carried by the casing one beneath each of said bearings, and connecting links extending between the bearings and lugs respectively having universal pivotal connection with said lugs and bearings to permit easy lateral vibration of the casing with respect to the bearings, said bearings all being in approximately the horizontal plane of the centre of gravity of the basket and said lugs being spaced below said horizontal plane, means by which the basket is rotatably mounted within the casing

consisting of a vertical shaft to the upper end of which the basket is fixed and a pair of vertically aligned bearings for the shaft carried by the casing spaced apart one above the other the upper bearing being disposed approximately at the centre of gravity of the basket in substantially the same horizontal plane as said first mentioned bearings, and drive means for the basket including an electric motor carried wholly by the casing and at the lower portion of the casing having connection with said shaft.

In testimony whereof I affix my signature.

HUBERT J. M. C. KRANTZ.