J. & A. PERSOONS.

GEARING.

APPLICATION FILED NOV. 16, 1905.

946,985. Patented Jan. 18, 1910.

Fig. 1.

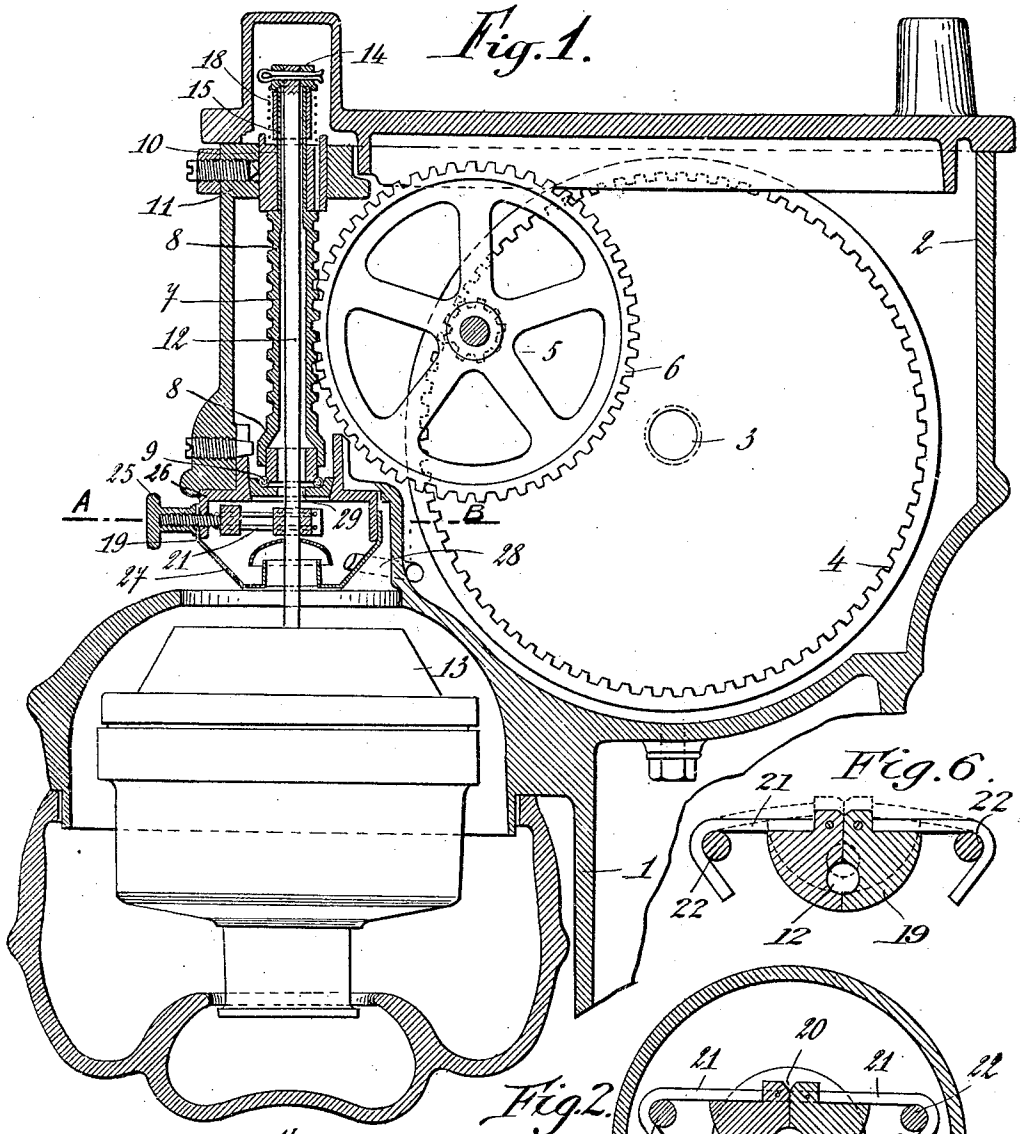


Fig. 6.

Fig. 2.

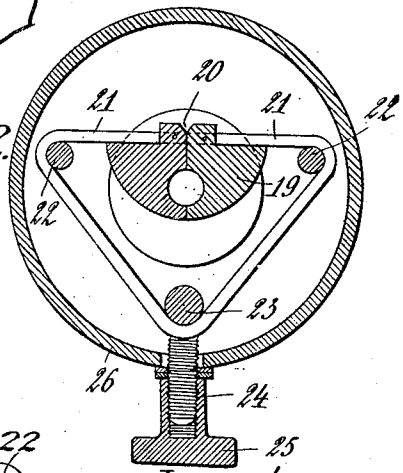


Fig. 3.

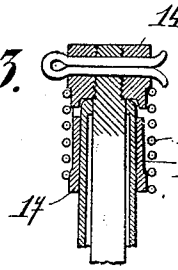


Fig. 4.

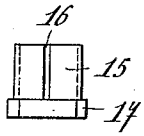
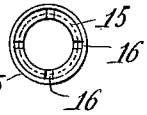


Fig. 5.



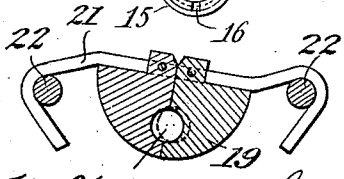


Fig. 7.

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UNITED STATES PATENT OFFICE.

JULES PERSOONS AND ALPHONSE PERSOONS, OF THILDONCK, BELGIUM.

GEARING.

946,985. Specification of Letters Patent. Patented Jan. 18, 1910.

Application filed November 16, 1905. Serial No. 287,598.

To all whom it may concern:

Be it known that we, JULES PERSOONS and ALPHONSE PERSOONS, both manufacturers and subjects of Belgium, residing at Thildonck, in the Kingdom of Belgium, have invented new and useful Improvements in Gearing, of which the following is a specification.

This invention relates to gearing adapted for use in connection with centrifugal cream separators of that class in which is made use of a freely suspended drum.

The invention has for its object to provide an improved driving mechanism for the drum of centrifugal cream separators of the class referred to, the said driving mechanism securing a more easy running of the drum, preventing any abnormal movement of the drum out of the center and allowing the running for long months without necessitating any inspection.

The invention consists more particularly in the special arrangement and combination of parts as hereinafter fully described and pointed out in the appended claims.

Referring to the annexed drawings: Figure 1 is a vertical section of a driving mechanism constructed according to the invention. Fig. 2 is a horizontal section, at an enlarged scale, on line A B in Fig. 1. Figs. 3 and 4 and 5 are detail views. Figs. 6 and 7 are detail views illustrating the action of the guide and the tension device therefor when the suspending rod and its load (the vessel) are rotating at different speeds.

As shown in Fig. 1 the skimming machine comprises a frame 1 forming at its upper part a closed casing 2 containing the driving gear and forming an oil reservoir. In this casing is mounted a horizontal shaft 3 carrying the driving handle or crank (not shown). On the said shaft is mounted a gear 4 meshing with a small pinion 5 shown in dotted lines in Fig. 1. The said pinion is integral with a toothed wheel 6 meshing with a screw 7 formed or mounted on the outer surface of a hollow shaft 8 bearing at its lower end on a ball bearing 9 and rotating at its upper part, without being capable of longitudinal displacement, in a bearing 10 carried by a bracket 11 forming part of the frame 1.

Through the hollow shaft 8 extends a rod 12 by which the centrifugal drum 13 is freely suspended. Said rod 12 carries at its upper end a suitably fixed nut 14 (Fig. 3) resting freely on the rounded or convex end of the hollow shaft 8. On the end of said shaft is located a sleeve 15 provided with slots 16 (Fig. 4) and having a flange or collar 17. The slots 16 are for the purpose of imparting a certain elasticity to the sleeve 15 which is preferably slightly conical and slid on to a corresponding conical portion of the shaft 8 (Fig. 3). The nut 14 is connected to said sleeve 15 by a coil spring 18, one end of which is attached to the nut 14 and the other end to the sleeve 15.

The rod 12 by which the centrifugal drum is suspended passes through the ball bearing 9 into a guide or block 19 (Fig. 2) preferably split or slotted at 20 and connected at one of its surfaces to a cable, cord, band or equivalent 21 passing around pins 22 fixed to a carrier 26 and around a pin 23 carried by a screw 24 provided with a nut 25. The guide block 19 with its coöperating parts 21, 22 and 23 is placed in the carrier 26 surrounded by a vessel 27 communicating through a pipe 28 with the casing 2 of the frame.

The driving mechanism constructed as described, operates as follows: When the shaft 3 is rotated, motion is transmitted to the pinion 5 and to the toothed wheel 6 which rotates the screw 7 of the hollow shaft 8. The said shaft acting through the sleeve 15, the spring 18 and the nut 14 causes the frictional driving of the rod 12 to take place and consequently the rotation of the drum 13 suspended to said rod. Simultaneously the oil contained in the casing 2 of the frame is carried along by the gearing 4 and communicated to the pinion 5 and toothed wheel 6, and the latter, owing to its high rotational speed distributes the oil to all the other parts of the mechanism, the oil flowing along the screw 7 lubricating the bearing 9 and guide-block 19, passing along the suspension rod 12 of the drum and finally accumulating in the vessel 27 whence it passes back into the reservoir 2 through the pipe 28, in such a manner that the lubrication is effected in a most economical and perfect manner, the same oil being repeatedly used without any appreciable loss.

During the rotation of rod 12 and the drum, the guide 19 and bend 21 offer slight resistance to slight movement from the center of said drum and the rod, but as the movements of said drum and the rod from

the center become greater, then the resistance to such movements is increased by the action of the band and the guide, such resistance to greater movements increasing automatically with the extent of the movements. This is explained as follows: During the rotation, the rod or shaft 12 tends to be thrown out of the center and the force which causes said deviations or oscillations of the rod may vary according to the drum 13 being more or less balanced. When the drum is well balanced, the oscillations of rod 12 from its normal central position are comparatively slight, as indicated in dotted lines in Fig. 6; then the guide 19 and band 21 can be quite flexible because said guide and band are not required to oppose a very great resistance to the deviations of the rod 12. Should the drum be not well balanced, however, and the oscillations of the rod 12 cause it to move any considerable distance from its central normal position, as shown in Fig. 7, it is necessary that the guide 19 and the band 21 shall oppose a greater resistance to said oscillations. It is necessary, therefore, that the resistance which is opposed by the guide 19 and the band 21 to the oscillating movements of the rod 12 shall vary with the tendency of the rod 12 to move out of its central normal position. The said result is secured by the construction herein described of the guide 19 and the band 21, so that when the oscillations of the rod 12 are small or quite limited, the guide is very flexible, the elasticity being secured by the band 21; on the contrary, when the oscillations are greater, the elasticity or freedom of movement of the guide 19, is diminished by the fact of the guide block 19 acting by its edges against the band 21 nearer to the pins 22 and tending to distort the band 21, as shown in dotted lines in Fig. 7. Further, it will be observed that owing to the frictional driving of the rod or shaft 12 by means of the sleeve 15, the said rod is adapted to oscillate freely while any breakdown of the mechanism is prevented, the sleeve 15 being adapted to slide on the shaft 8 in case of too hard driving.

Having thus described our invention, what we claim is:

1. A driving mechanism for the drum of a centrifugal cream separator, comprising: a frame forming a casing, a driving gear located in the said casing, a hollow shaft rotated by the said driving gear, a rod extending through said hollow shaft, frictional driving means between the hollow shaft and the rod, a guide for said rod and means whereby lubricant is adapted to be supplied to the coöperating parts of the driving mechanism substantially as described and for the purpose set forth.

2. In a centrifugal cream separator, a driving mechanism comprising: a frame forming a casing, a driving gear located in the said casing, a hollow shaft provided with a screw adapted to be rotated by said driving gear, a rod extending through the said hollow shaft, frictional driving means between the hollow shaft and the said rod, a guide for said rod, the said guide comprising a block, a band to which the said block is fixed and means for tensioning the band, and a carrier for said guide, substantially as, and for the purposes described.

3. In a centrifugal cream separator, a driving mechanism comprising a frame forming a closed casing, a driving gear located in the said casing, a hollow shaft provided with a screw adapted to be rotated by said driving gear, a rod extending through the said hollow shaft, a friction sleeve acting on the end of the hollow shaft, a nut fixed to the end of the rod, a spring connecting said nut with the friction sleeve, a guide for the rod, a carrier for said guide, a vessel fixed to the said carrier and a communicating pipe between the said vessel and the casing of the frame, substantially as described and for the purpose set forth.

4. In a centrifugal cream separator, a driving mechanism comprising: a frame forming a closed casing, a driving gear located in said casing, a hollow shaft provided with a screw adapted to be rotated by said driving gear, a ball bearing supporting the lower end of said hollow shaft, a rod extending through the hollow shaft, a nut at the end of said rod, a spring connected to said nut, a friction sleeve connected to the second end of the spring and acting on the upper end of the hollow shaft, a guide for the rod, the said guide being located under the ball bearing for the hollow shaft, a carrier for said guide, the said carrier communicating with the ball bearing, a vessel fixed to the said carrier and a communicating pipe between the said vessel and the frame casing, substantially as described and for the purpose set forth.

5. In a device of the class described, a hollow shaft, means for rotating said shaft, a load carrying member extending through said shaft, and a frictional driving device operating to suspend the member from said shaft and to transmit the motion of said shaft to said member.

6. In a device of the class described, a hollow shaft, means for rotating said shaft, a load carrying member extending through said shaft, a driving sleeve having frictional engagement with the shaft, a device secured to the load-carrying member, and a yielding connection between the sleeve and said device whereby the motion of the shaft is transmitted to the load-carrying member.

7. In a device of the class described, a load carrying member, means for rotating said member, a guide-block surrounding the load

carrying member at a point intermediate its ends, a resistance band to which said block is attached, and a tension device for said band.

8. In a device of the class described, a load-carrying member, means for rotating said member, a guide coöperating with said member, a casing provided with a chamber adapted to contain lubricant to be supplied automatically to the aforesaid parts, a lubricant collecting vessel positioned below said guide, and a pipe intermediate said chamber and the liquid collecting vessel.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

JULES PERSOONS.
ALPHONSE PERSOONS.

Witnesses:
GEORGE BEDE,
GREGORY PHELAN.