May 9, 1933. W. ZUR LÖWEN 1,907,929

SPINNING CENTRIFUGE

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Fig. 1.

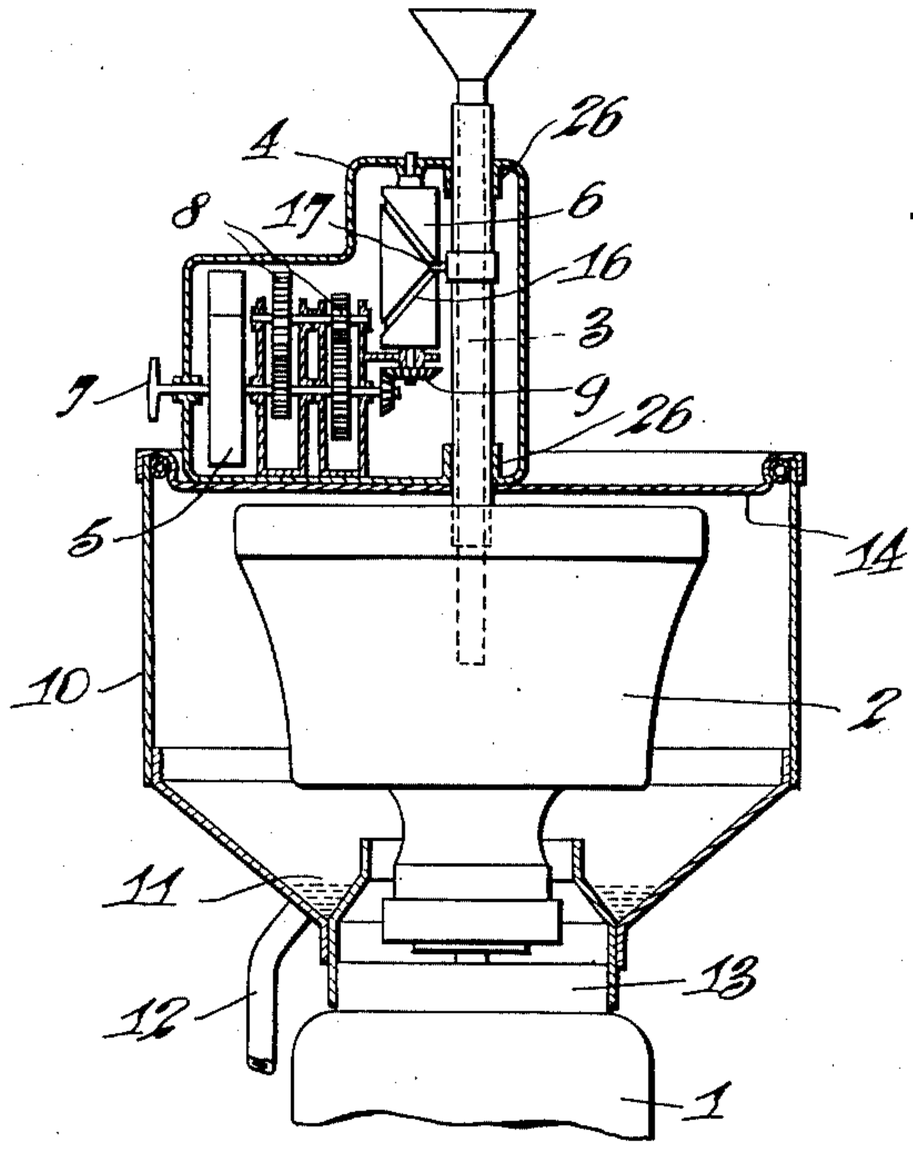

Fig. 2.

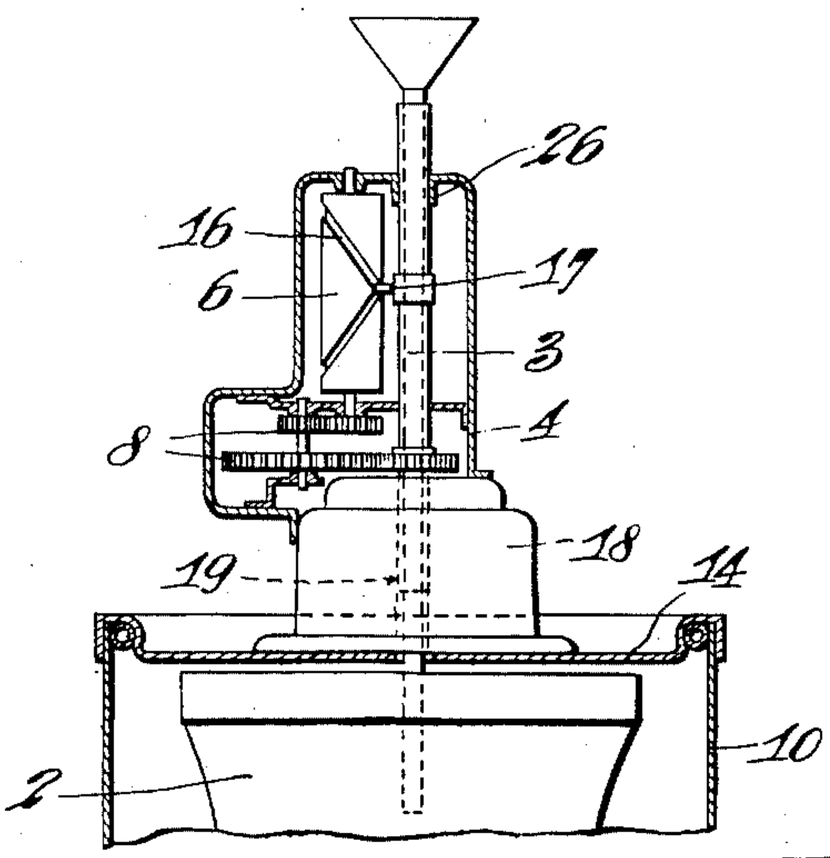

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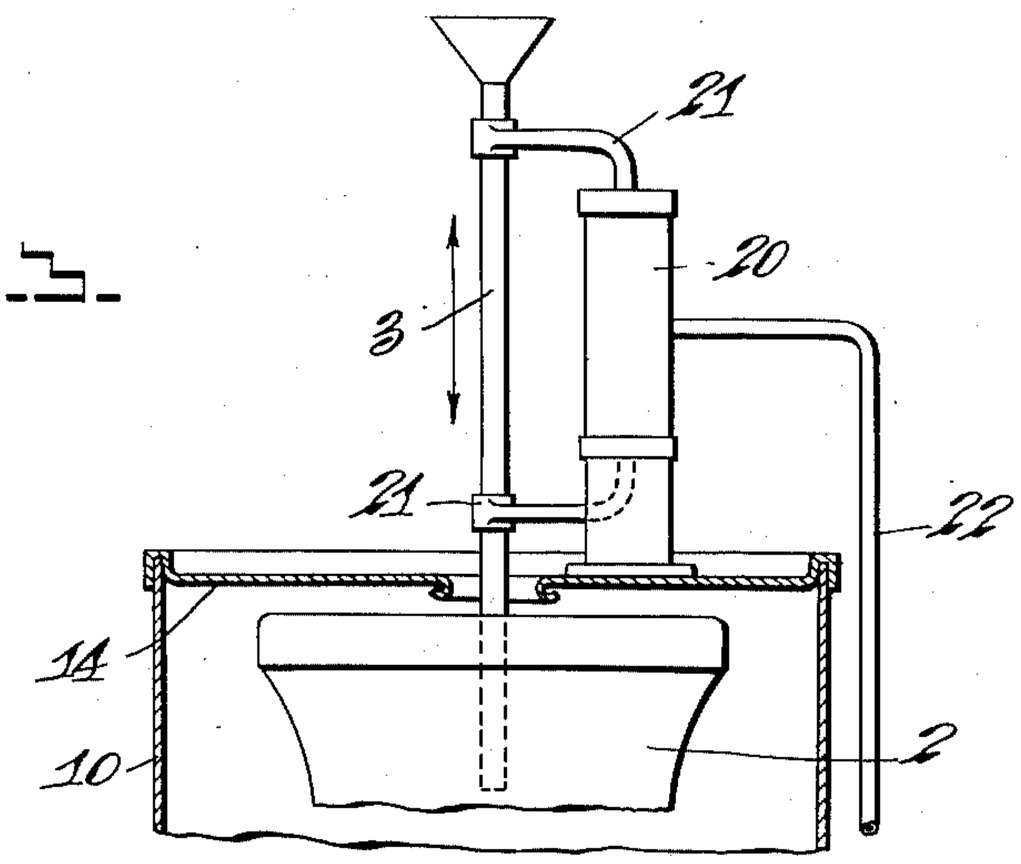
Fig. 3.



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UNITED STATES PATENT OFFICE

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SPINNING CENTRIFUGE

Application filed August 11, 1931, Serial No. 556,428, and in Germany August 14, 1930.

In the manufacture of artificial silk it is necessary for laying the filament against the inside of the wall of a spinning pot to impart to the guiding tube of the filament an axial upward and downward motion relative to the spinning pot. This has hitherto been effected by journalling the centrifuge movably and imparting to it an upward and downward motion by means of a rocking drive. This drive is inconvenient and owing to the large masses to be moved requires a considerable driving power.

These methods of driving have therefore been abandoned and the practice has been adopted to journal the centrifuge and the pot so as to be stationary and to impart to the filament guiding tube an upward and downward motion. These tubes are fixed to bars and have an upward and downward motion imparted to them by a cam drive through the intermediary of a common rocking shaft. As the motion is imparted from a main drive to a number of filament guiding tubes the transmission gear is complicated. A further disadvantage is that in the case of a breakdown the whole of the series having a common drive is put out of action.

Furthermore it is necessary to protect the parts of the rodwork lying in the neighborhood of the centrifuge from chemical action, which makes the construction still more complicated. A further disadvantage is that, with an increase in the spinning speed, which entails the more rapid upward and downward motion of the filament guiding tube, the large masses to be moved cause vibrations of the rodwork and of the filament guiding tube, which disturb the spinning operation.

These disadvantages are overcome by the invention through the provision of a separate drive for each filament guiding tube. As the upward and downward motion of the filament guide is a slow motion, it is necessary to provide between the driving means and the filament guiding tube a transmission gear which drives a cam guide, for instance a reversing worm, and thereby converts the rotary motion of the drive into an upward and downward motion of the filament guiding tube. This separate drive is mounted directly on the centrifuge casing for instance on the cover of a protective box for the spinning pot or laterally on the protective box or on the motor casing. As the power required for driving the filament guiding tube is very small, the driving means need only be capable of transmitting a very small power. Thus, for instance, an electric motor, water motor, compressed air motor or spring mechanism of small dimensions can be used, which can be mounted on the centrifuge in a simple manner.

The drive for the filament guiding tube can also be effected without a separate motor directly from the driving motor of the pot. Owing to the high speed of revolution of the spinning pot and the slow upward and downward motion of the filament guiding tube, it is in this case also necessary to interpose the transmission gear between the spinning pot motor and the filament guiding tube. By this means the drive and more particularly the transmission gear is considerably simplified. Furthermore a considerable increase in the spinning speed becomes possible without the danger of excessive vibrations as the upwardly and downwardly moving masses are only small. A special advantage of the arrangement consists in this, that the laying of the filament in the spinning pot is very regular as the rotary motion of the spinning pot and the upward and downward motion of the filament guiding tube are positively coupled together by the transmission gear. Consequently even considerable variations in the speed of revolution of the centrifuge motor can have no influence on the uniform formation of the layers as the ratio of the main speed of the filament guiding tube to that of the revolutions of the spinning centrifuge remains constant. This peculiarity of the centrifuge drive is of special importance in view of the impossibility of always keeping the revolutions of the driving motor constant. The said variations in the speed of revolution are caused by variations in the voltage in the electric network or by considerable variations in the loading on the centrifuge.

For enabling the spinning pot to be removed the guiding tube is mounted on its

holder so as to be capable of being swung aside. The holder is connected by a releasable coupling with a driving bar which is moved upwards and downwards by the transmission gear. The holder is held by the coupling and is so guided by the rodwork with the filament guiding tube moves concentrically with respect to the axis of the pot. For rocking the tube aside it is necessary slightly to raise the holder, whereby the coupling is released and the holder can be rocked aside. This frees the cover of the protective box, which can then be removed. The filament guiding tube can also be guided by the cover of the protective casing of the spinning pot having a guide in the central axis of the latter. In this guide the tube itself or the clamping sleeve in which the tube is gripped is guided. This provides a simple and reliable guide for the tube. Vibrations which might easily be caused by the considerable overhang of the holder are avoided by this special arrangement.

The transmission gear for the filament guiding tube can also suitably be mounted on a separate protective box, in which spinning pot motors of different size can be conveniently housed. The motor shaft is flexibly extended downwards and brought into engagement with the transmission gear. The transmission gear together with the cam drum for the filament guiding tube and the switch is preferably also mounted in the interior of the casing. The protective casing for the spinning pot is suitably mounted on the casing or made integral with the latter. The filament guide bar and the switch lever are brought out at the top at the neck of the casing. The motor itself is mounted on supports in the interior of the casing and is centered by the said supports.

The provision of a separate protective casing enables a uniform construction of the filament guiding mechanism and of the switch on single spinning pots and the arrangement can be adapted to motors of different sizes by the introduction of supports of suitable dimensions.

Several constructional examples of the invention are shown diagrammatically in the accompanying drawings, in which

Fig. 1 shows the upper part of a centrifuge with a spring-operated mechanism for driving the filament guiding tube,

Fig. 2 a similar centrifuge having an electric motor for driving the filament guiding tube,

Fig. 3 a similar centrifuge with a water motor as the drive for the filament guiding tube.

In Fig. 1 and in the constructional examples shown in Figs. 2 and 3, the spinning pot 2 of the centrifuge is driven by an electric motor disposed in the casing 1. At the top the casing 1 is a flange 13, on which a protective casing 10 surrounding the spinning pot 2 is placed. The protective casing 10 tapers conically downwards and has at its lower end an internal annular gutter 11 for collecting thrown off liquid which is led away through the tube 12. On the cover 14 of the protective casing 10 is mounted a spring-operated mechanism for driving the filament guiding tube 3. The spring-operated mechanism which is enclosed in a casing 4 consists of a clock spring 5, a transmission gear and a drum 6. The clock spring 5 is stressed by being wound up by means of a handle 7. It drives the drum 6 through the transmission gear formed by two pairs of spur wheels 8 and the bevel wheels 9. On the drum 6 is provided a reversing worm 16 in the form of a groove, in which a pin 17 fixed to the filament guide 3 engages. The filament guide 3 is guided in two bearings 26 on the casing 4 and has a slow upward and downward motion imparted to it by the reversing worm 16.

In Fig. 2 there is mounted concentrically on the cover 14 of the protective casing 10 a small electric motor 18 with a hollow shaft 19, through which the filament guiding tube 3 extends into the interior of the spinning pot. The electric motor 18 drives through two pairs of transmission wheels 8 a drum 6, which is provided with a reversing worm 16 in the form of a groove. In the reversing worm 16 there engages a pin 17 fixed on the filament guiding tube 3, which moves the filament guiding tube slowly upward and downwards.

According to the constructional form shown in Fig. 3 the filament guiding tube 3 is moved upwards and downwards by means of a small piston water motor 20 mounted on the cover 14 of the protective casing 10. The filament guiding tube is connected to the piston of the water motor 20 by means of the holders 21. The water under pressure for driving the water motor 20 is supplied through the pipe 22.

What I claim is:

1. In a device of the class described, a spinning pot, a housing therefor, said housing being provided with a cover, means to rotate said spinning pot, a thread guide for leading thread into said spinning pot, means for reciprocating said thread guide comprising driving means operatively connected therewith and secured to the said cover.

2. In a device of the class described, a spinning pot, a housing therefor, said housing being provided with a cover, means to rotate said spinning pot, a thread guide for leading thread into said spinning pot, means for reciprocating said thread guide comprising a motor operatively connected therewith and secured to the said cover.

3. In a device of the class described, a spinning pot, a housing therefor, said housing being provided with a cover, means to rotate

said spinning pot, a thread guide for leading thread into said spinning pot, means for reciprocating said thread guide comprising water driven mechanism operatively connected therewith and secured to the said cover.

4. In a device of the class described, a spinning pot, a housing therefor, said housing being provided with a cover, means to rotate said spinning pot, a thread guide for leading thread into said spinning pot, means for reciprocating said thread guide comprising an electric motor operatively connected therewith and secured to the said cover.

In testimony whereof I affix my signature.

WALDEMAR ZUR LÖWEN.