

April 14, 1931.

P. ASHWORTH

1,801,065

SIZING MACHINE FOR ARTIFICIAL SILK

Filed Oct. 23, 1929

7 Sheets-Sheet 1

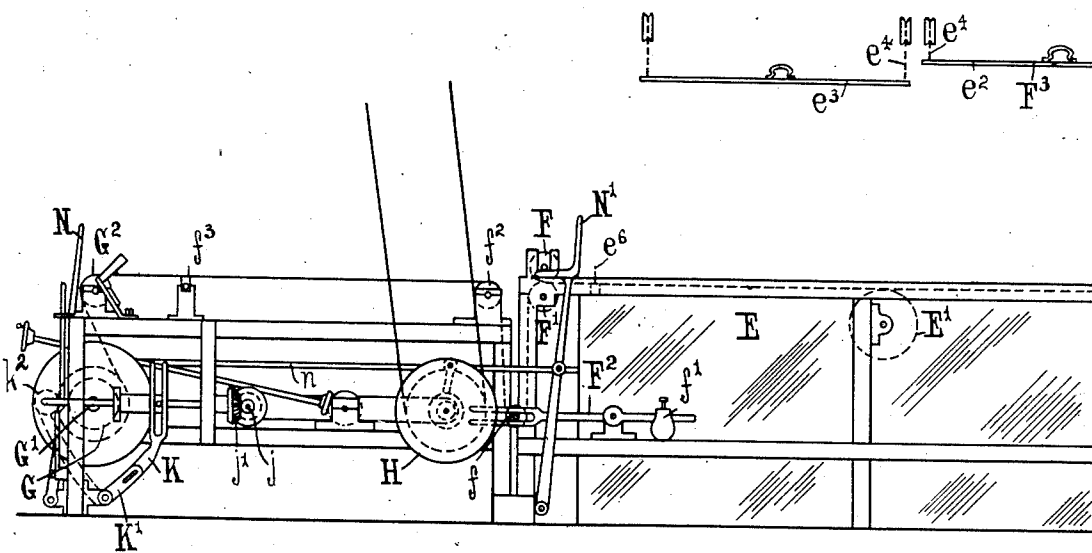


Fig. 1.

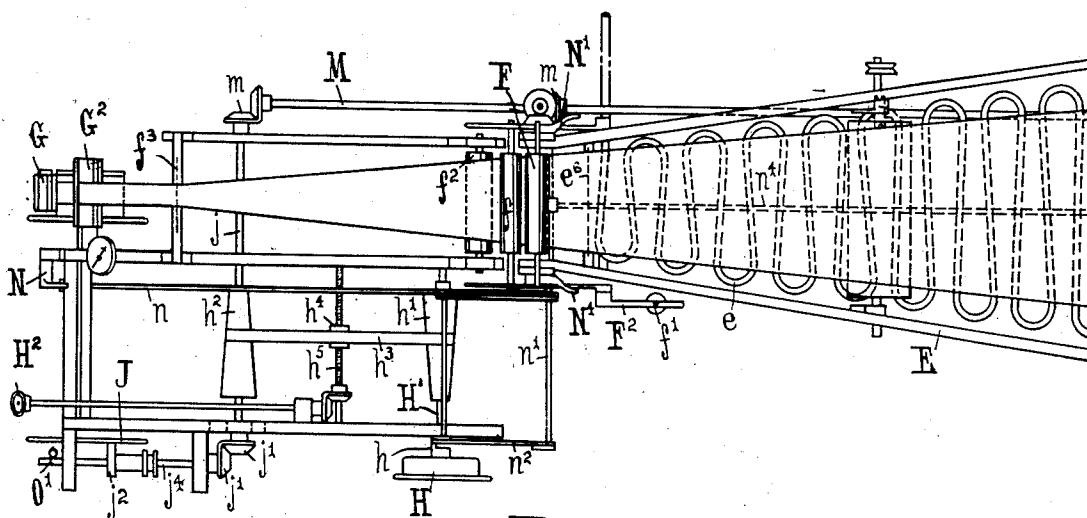


Fig. 2.

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7 Sheets-Sheet 2

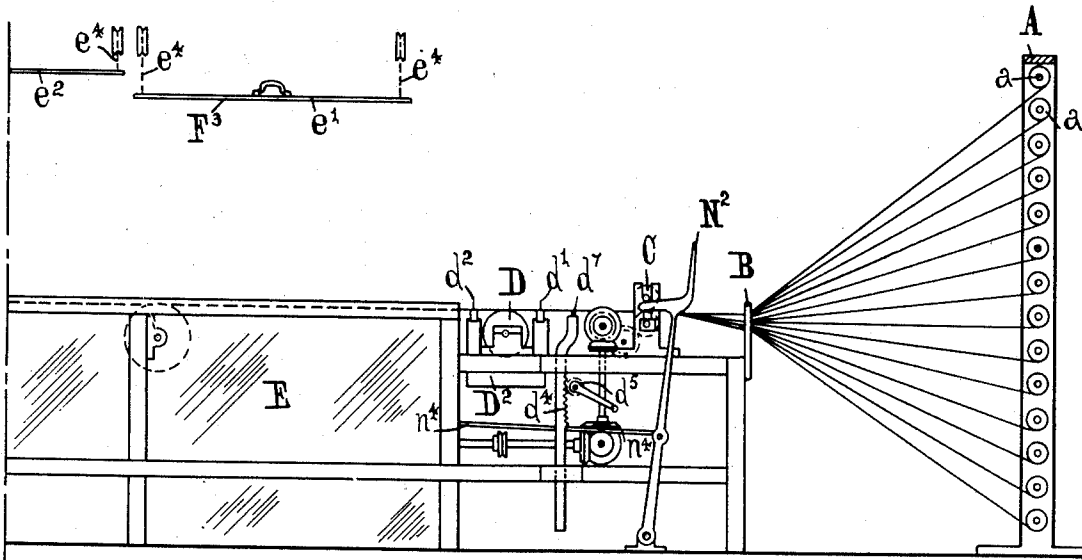


Fig. 1a.

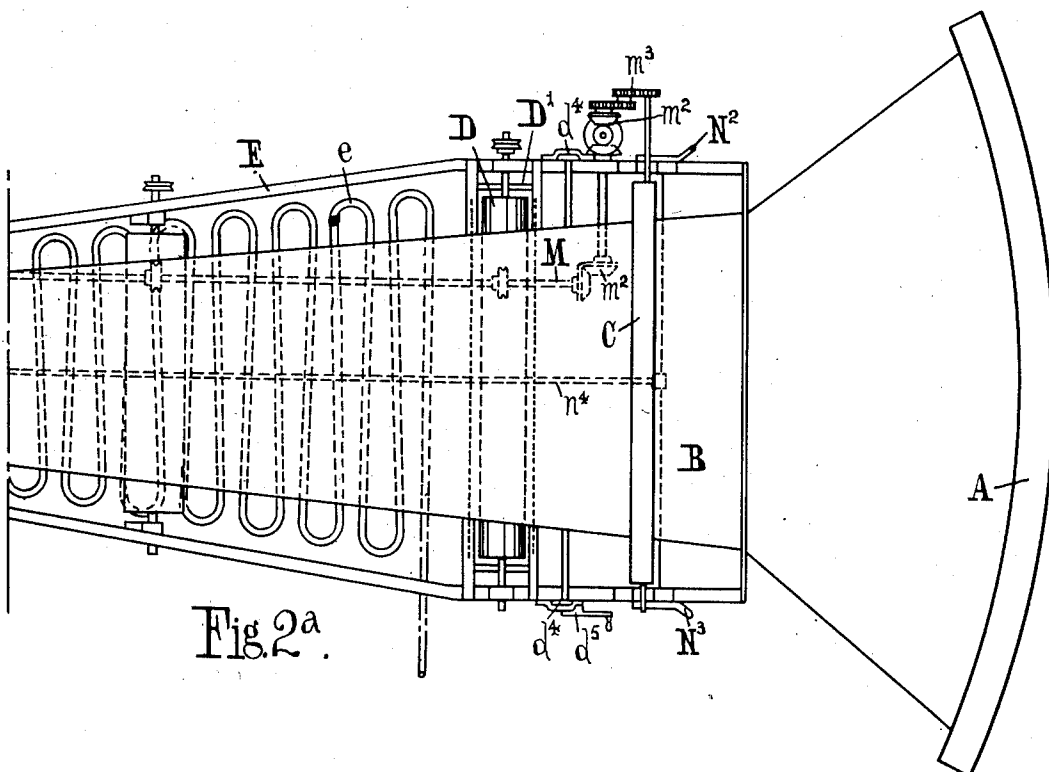


Fig. 2a.

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7 Sheets-Sheet 3

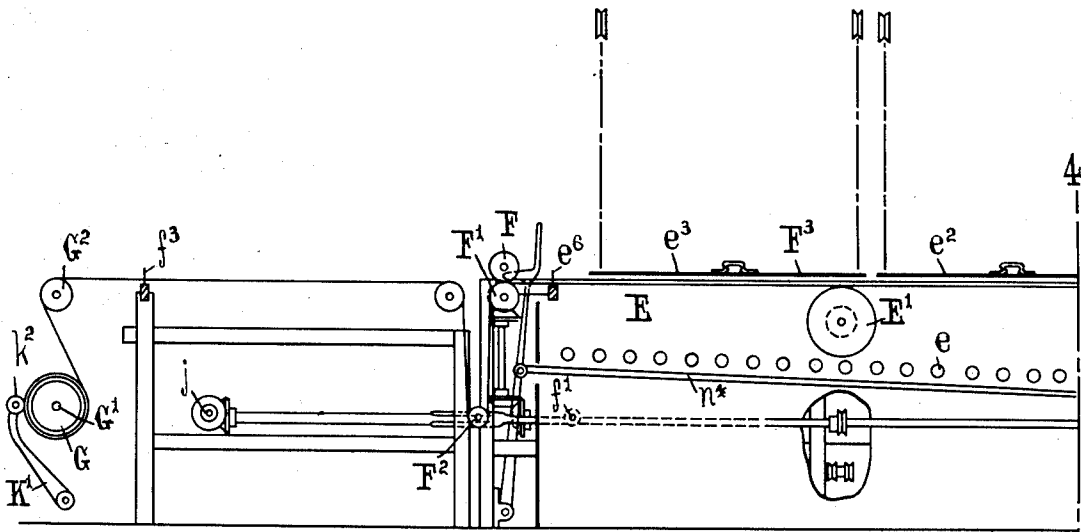


Fig. 3.

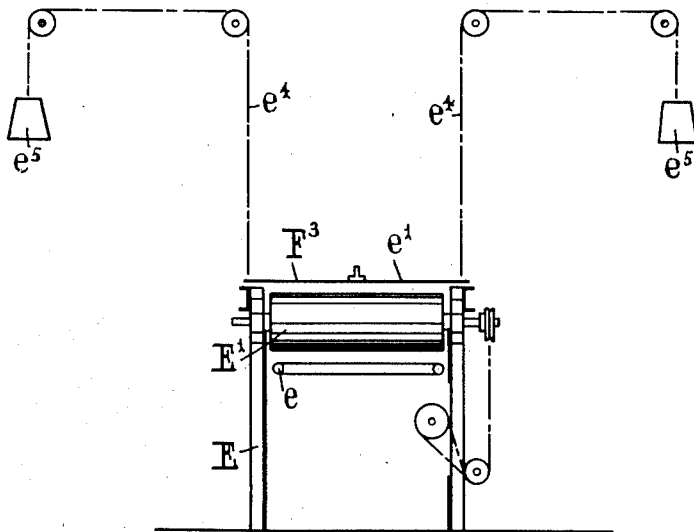


Fig. 4.

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7 Sheets-Sheet 4

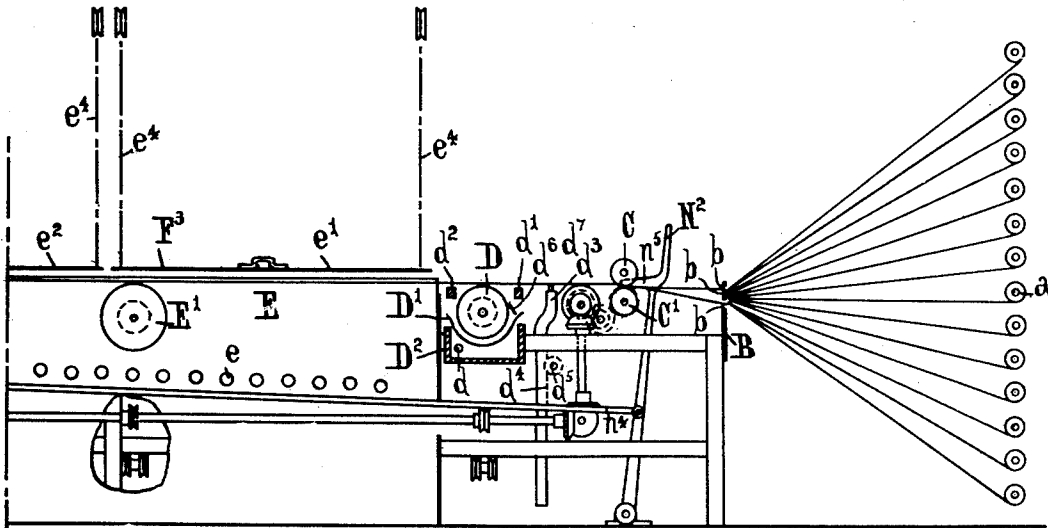


Fig. 3a.

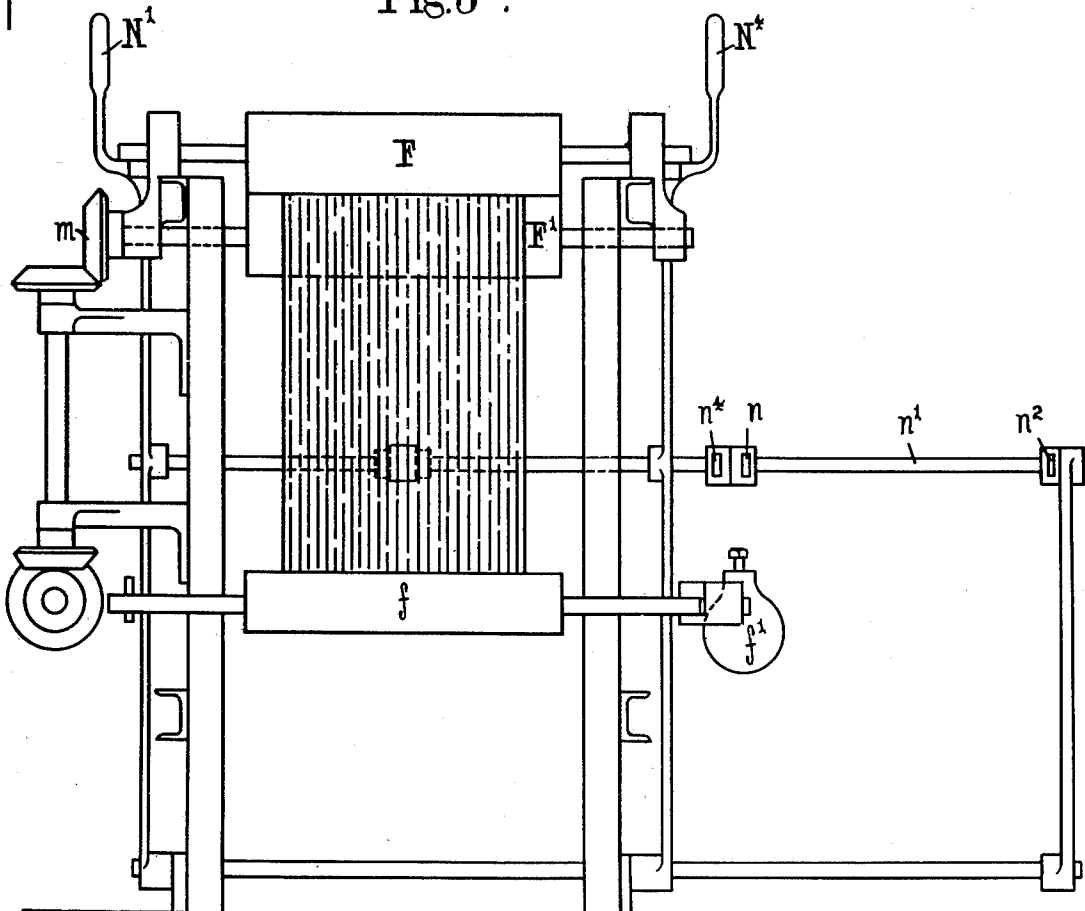


Fig. 7.

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7 Sheets-Sheet 5

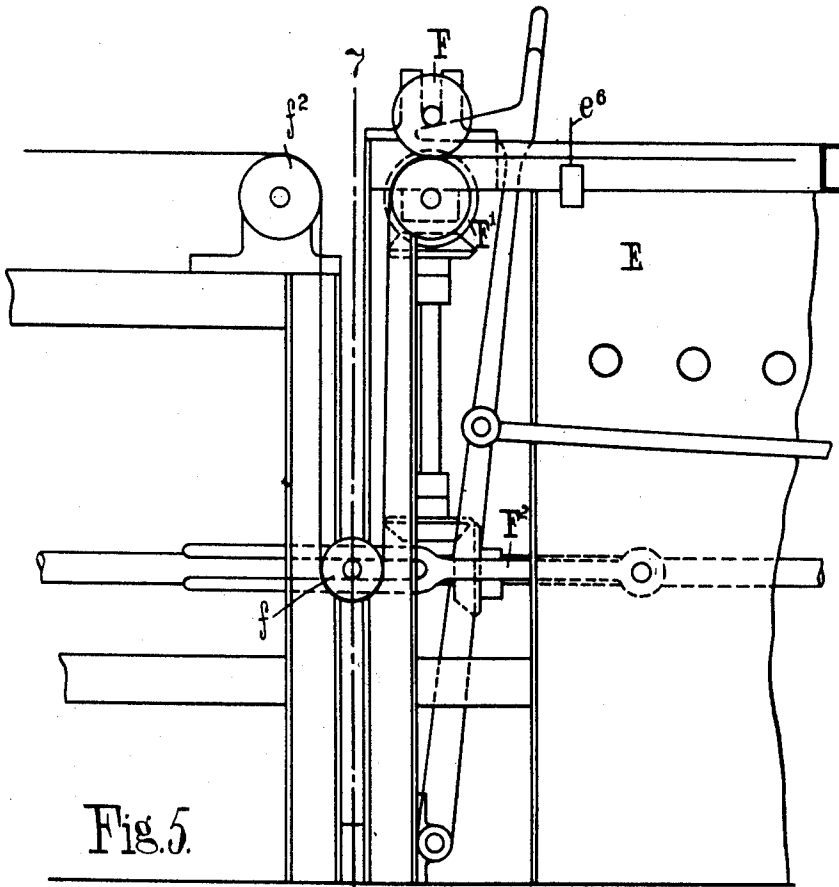


Fig.5.

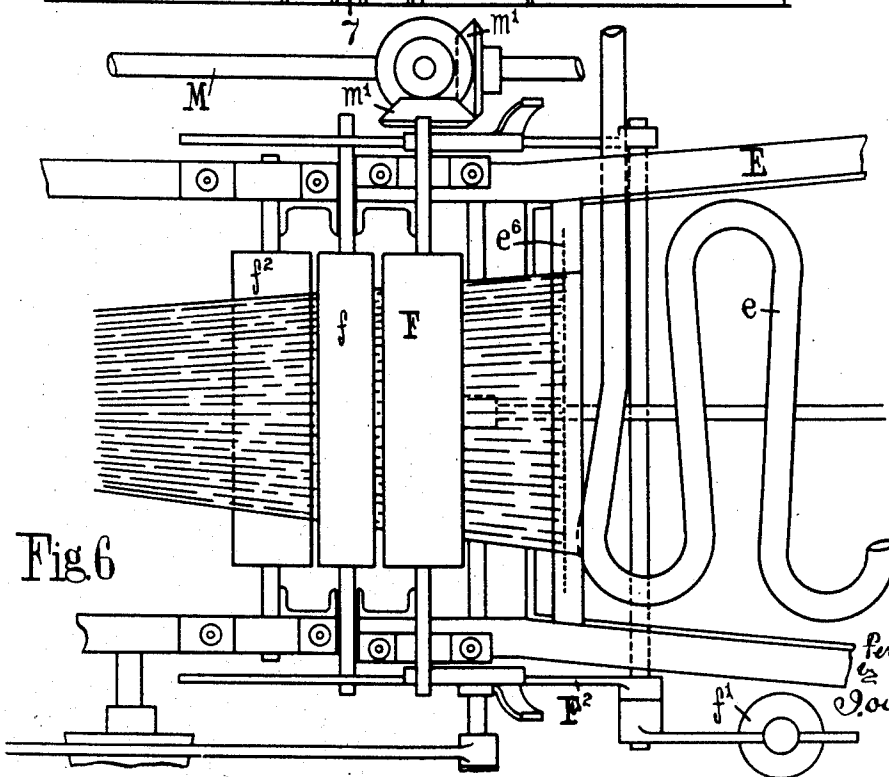


Fig.6

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SIZING MACHINE FOR ARTIFICIAL SILK

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7 Sheets-Sheet 6

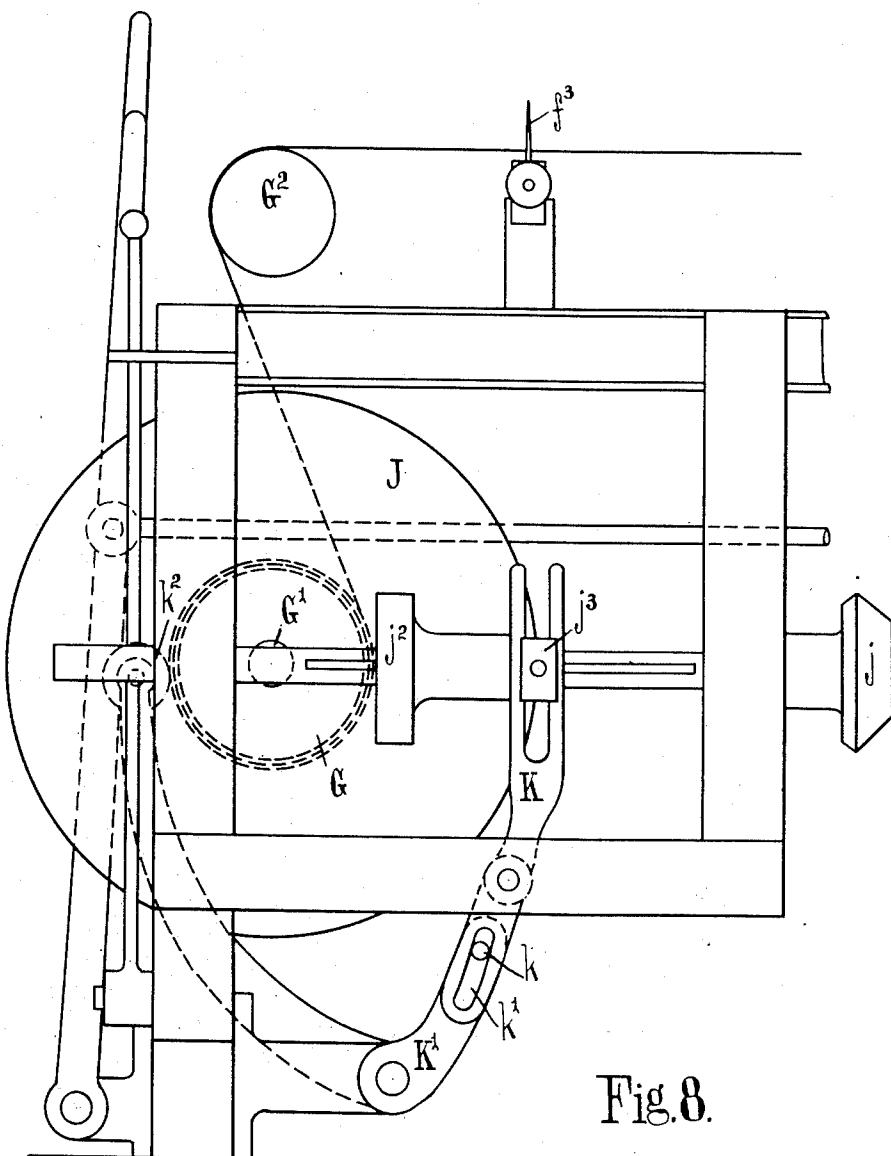
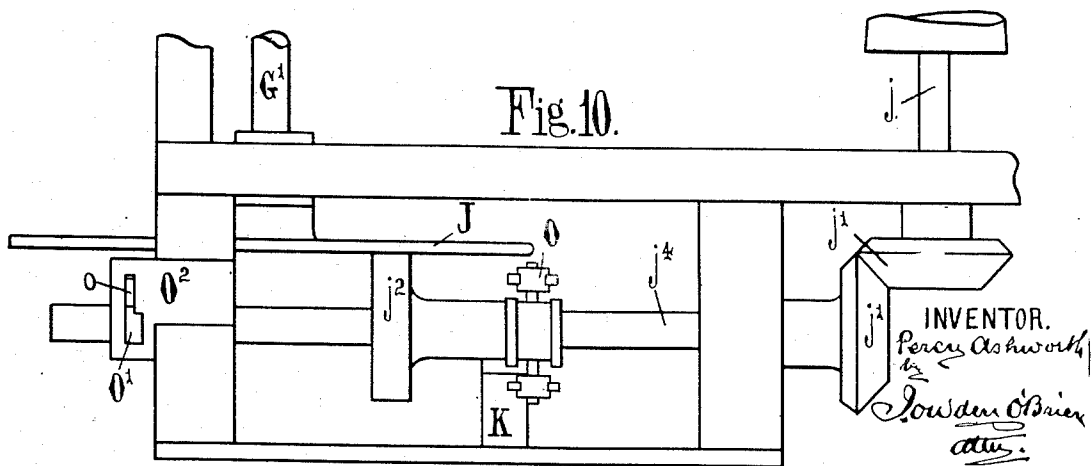


Fig.8.



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7 Sheets-Sheet 7

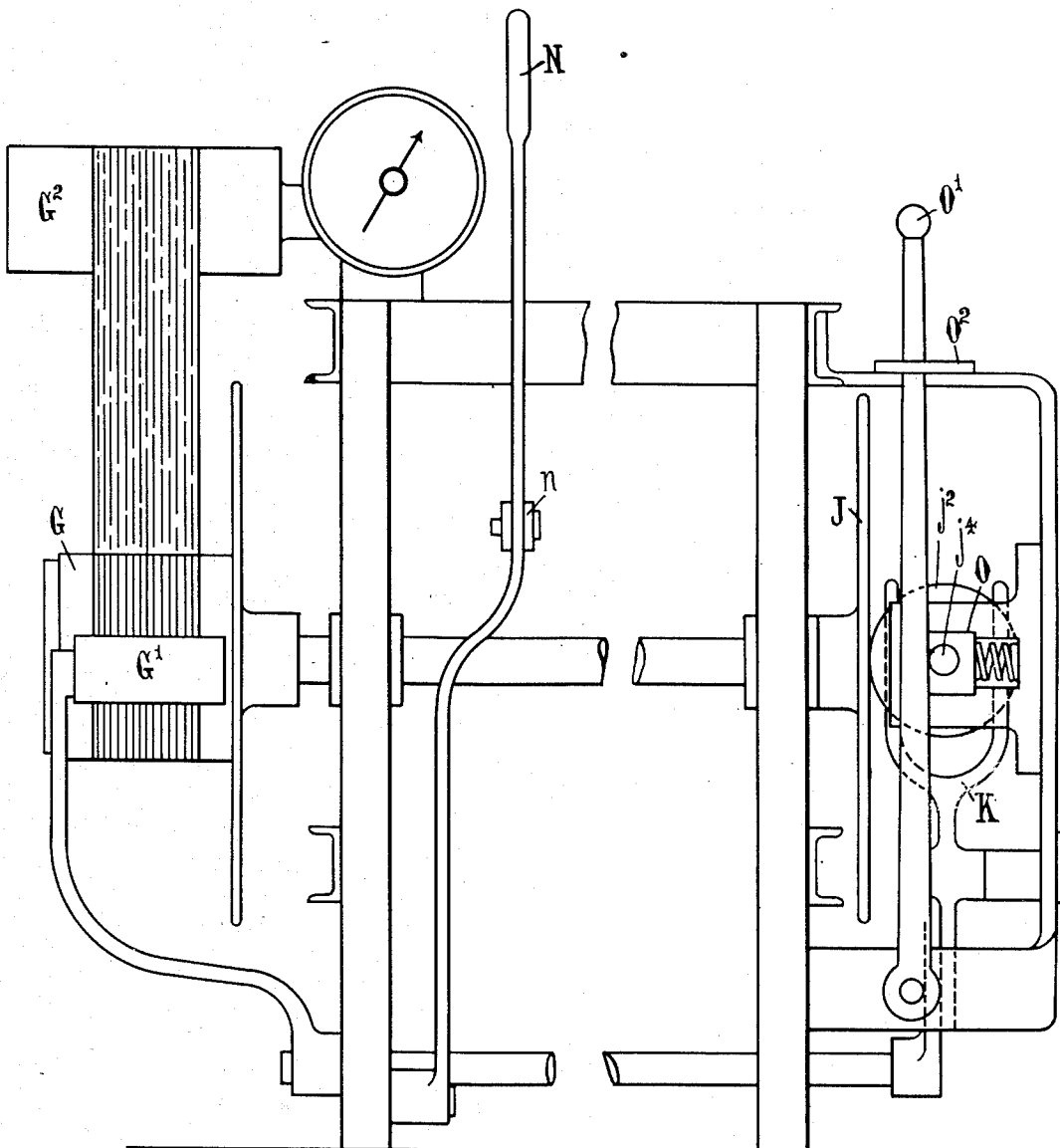


Fig. 9.

INVENTOR.

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UNITED STATES PATENT OFFICE

PERCY ASHWORTH, OF SALFORD, ENGLAND

SIZING MACHINE FOR ARTIFICIAL SILK

Application filed October 23, 1929, Serial No. 401,878, and in Great Britain November 1, 1928.

This invention relates to improvements in machines for sizing textile yarns and is particularly applicable for sizing yarns of artificial silk.

It consists essentially of a machine in which the yarn to be sized is withdrawn from bobbins, passed over a sizing roller, through a drying chamber and wound onto a section or sections at the front end of the machine, from which if it is desired the yarn can be re-wound onto the weaver's beam.

The invention will be described with reference to the accompanying drawings:—

Figs. 1 and 1a show a side view of the sizing machine.

Figs. 2 and 2a show a plan view of the machine.

Figs. 3 and 3a show a longitudinal section of the machine.

Fig. 4 is a transverse section on line 4—4 Fig. 3.

Fig. 5 is a side elevation on a larger scale of the delivery mechanism at the end of the drying chamber.

Fig. 6 is a plan of same.

Fig. 7 is a transverse section on line 7—7 Fig. 5.

Fig. 8 is a side elevation on the same scale as Figs. 5 to 7 of the winding end of the machine showing the mechanism for winding the yarn onto the section.

Fig. 9 is an end view of same.

Fig. 10 is a part plan of same.

The yarn to be sized is wound on bobbins *a* carried by a crescent shaped creel *A* at the feed end of the machine, and passes into the machine through porcelain eyes or guides *b* carried by a board or bar *B* there being a separate eye *b* for each thread and the eyes being preferably arranged in three rows.

A pair of driven rollers *C*, *C*¹ are arranged in front of the eyes *b* to draw the yarn off the bobbins *a* and deliver it to the sizing roller *D* which is also driven and rotates in the trough *D*¹ which is heated by a second trough *D*² containing hot water maintained at the desired temperature by a steam pipe *d* immersed in the water. A doctor or roller *d*³ contacts continuously with the roller *D* to remove surplus size from the roller. Reeds

*d*¹, *d*² are arranged at each side of the sizing roller *D* to keep the yarn separate as it passes over the sizing roller and a bar *d*⁷ carried on arms *d*³ controlled by a rack *d*⁴ and pinion *d*⁵ is arranged between the sizing roller *D* and the draw rollers *C*, *C*¹ so that the yarn can be lifted from the sizing roller *D* when the machine is stopped.

The drying chamber *E* is immediately in front of the sizing roller *D* and is heated by steam pipes *e* or by radiators or in any other suitable way. Rollers *E*¹ are arranged transversely of the chamber *E* to support the yarn during its passage through the chamber. The rollers *E*¹ may be driven as shown in the drawings or they may be so mounted that they will freely rotate by the passage of the yarn over them.

The cover *F*³ of the chamber *E* is preferably made in a number of sections *e*¹, *e*², *e*³ for easy manipulation, each section of the cover being suspended by four cords or chains *e*⁴ having a counterweight *e*⁵ at their free ends.

A second pair of driven rollers *F*, *F*¹ are arranged at the outlet end of the chamber *E* and the speed of the rollers *C*, *C*¹ relative to the speed of the rollers *F*, *F*¹ can be regulated so that the former will run slightly faster or slower than the latter. Thus a draft or tension to suit different counts and qualities of yarn can be arranged between the two pairs of rollers. A reed or comb *e*⁶ through which the yarn passes is arranged immediately in front of the rollers *F*, *F*¹.

A jockey pulley *f* is carried in a slot in one end of a pivoted lever *F*² the other end of which carries a sliding weight *f*¹ and this pulley serves to apply tension to the yarn after leaving the second pair of driven rollers *F*, *F*¹ maintaining an even tension between these rollers and the section, the amount of tension being adjusted by altering the position of the sliding weight *f*¹ on the lever *F*².

The section *G* onto which the yarn is wound is removably mounted at the front end of the machine on a shaft *G*¹ and the yarn passes thereto from the jockey pulley *f* over the roller *f*², through the reed or comb *f*³

and over a measuring roller G^2 which measures the length of yarn wound onto the section G.

The width of the layer of yarn as it passes through the machine is gradually narrowed to the width of the section (see Fig. 3) and this is effected by means of the various combs or reeds, the dents in each succeeding comb or reed being placed closer together than in the preceding one.

All the driven parts of the machine are driven from the main driving pulley H which is connected to the shaft H^1 by a friction clutch h to allow a certain amount of slip on starting up. One pulley h^1 of a pair of cone pulleys h^1, h^2 is mounted on the shaft H^1 and drives the second pulley h^2 through the belt h^3 . The position of the belt h^3 can be regulated by the fork h^4 mounted on the screwed rod h^5 which can be rotated by the hand wheel H^2 at the front of the machine. Thus the speed of the machine can be adjusted by altering the position of the belt h^3 on the pulleys h^1, h^2 to control the speed of drying the yarn to suit different qualities or types of yarn.

The cone pulley h^2 is affixed on the shaft j which drives the shaft G^1 carrying the section G through the bevel wheels j^1 and friction wheel j^2 , the latter engaging with the face of the friction disc J on the shaft G^1 . As the yarn is wound on the section G each succeeding layer is of greater diameter than the preceding one, so that it is necessary to reduce the speed of rotation of the shaft G whilst maintaining the speed of the other parts of the machine constant. The friction wheel j^2 is accordingly mounted to slide on its shaft and a projection j^3 on the wheel is engaged by the forked end of a pivoted lever K. The other end of the lever K is provided with a pin k which engages in a slot k^1 in one end of a bell crank lever K^1 the other end of which carries a roller k^2 which bears against the yarn as it is being wound onto the section G. Thus as the diameter increases the bell crank lever K^1 moves the forked end of the lever K and causes the friction wheel j^2 to be gradually moved outwards over the face of the friction disc J so that the speed of revolution of the latter gradually decreases as the diameter of the yarn on the section G increases.

The shaft j also drives a shaft M running the whole length of the machine through the bevel wheels m . The shaft M is connected to the shaft of the bottom roller F of the roller F, F^1 through the bevel wheels m^1 and to the shaft of bottom roller C of the rollers C, C^1 through the bevel wheels m^2 . A change wheel m^3 is preferably interposed between the bevel wheels m^2 and the shaft of the roller C so that the relative speed of the rollers F, F^1 and the rollers C, C^1 can be altered if desired.

The clutch h connecting the driving pulley H with the shaft H^1 is controlled by a setting on handle N at the front of the machine which is connected to the clutch through the links n, n^1, n^2 .

As the sizing machine is of considerable length a number of additional starting handles N, N^1, N^2, N^3, N^4 are also provided at other parts of the machine and these are connected to a rod n^4 extending the length of the machine. This rod n^4 is connected to the link n^2 so that the machine can be restarted by any of the handles N^1, N^2, N^3, N^4 after it has been stopped by the main handle N at the front of the machine.

To enable the section G to be stopped without stopping the rest of the machine and the jockey pulley f to adjust itself should irregularities in tension occur, the friction wheel j^2 can be brought out of engagement with the friction disc J. The shaft j^4 is carried in spring controlled bearings O. A lever O^1 pivoted on the frame bears against the shaft j^4 so that the movement of the lever O^1 moves the shaft j^4 to bring the wheel j^2 out of contact with the disc J. The lever O^1 works in a slot o on a plate O^2 so that it can be held in the open position.

When the machine is stopped particularly on breakage of a thread it is advisable that the rollers C^1 and F^1 should be lifted from the yarn which allows the yarn free play for shrinkage, the jockey roller riding on the yarn rises as this shrinkage takes place, and to effect this the auxiliary starting handles N^1 and N^2 are arranged adjacent to the rollers F and F^1 and the handles N^3, N^4 adjacent to the rollers C and C^1 . Each handle is formed with an inclined projection n^5 which passes under the shaft of the top roller F^1 or C^1 and raises the roller when the handle is moved on the stopping of the machine and lowers the roller when the machine is again started.

It is important that the setting of these parts allows the rollers to come together again before the friction clutch engages.

If it is desired that paper should be inserted between the layers of yarn as the latter is wound onto the section G, sheets of paper may be fed in by hand by the attendant at intervals after the section has made a few revolutions according to the number of layers of yarn it is desired should be wound between each layer of paper.

What I claim as my invention and desire to protect by Letters Patent is:—

1. A machine for sizing textile yarns comprising in combination a creel, a plurality of bobbins carrying the yarn mounted thereon, a pair of driven rollers to withdraw the yarn from the bobbins, a trough containing size, a roller rotating in said trough over the surface of which the yarn passes, a horizontal drying chamber for drying the yarn after it has been

sized, steam heated means for heating the drying chamber, a pair of driven rollers at the outlet end of the drying chamber, a rotating section to receive the yarn after being sized and dried, a friction wheel and friction disc for driving the rotating section, an adjustable weighted jockey pulley suspended by the yarn between the last pair of driven rollers to apply tension to the yarn, a number of combs arranged at intervals along the machine for the purpose of keeping the separate threads apart and for gradually narrowing the width of the layer of yarn as it passes through the machine, a measuring roller over which the yarn passes and which measures the length of yarn wound onto the section, means for varying the speed of rotation of the driven rollers at the rear of the machine to those at the front of the drying chamber, a plurality of starting handles at different positions on the machine, all of which are connected to a link motion controlling a clutch between the driving pulley and the main shaft and projections on the starting handles which when the machine is stopped will raise the top rollers out of engagement with the bottom rollers.

2. In a machine for sizing textile yarns the provision of a pair of driven rollers at the outlet end of the machine, a lever system pivoted to the frame, a jockey pulley carried in slots in one end of the lever system and a sliding weight carried by the lever system, said jockey pulley serving to apply tension to the yarn after leaving the pair of driven rollers to maintain an even tension on the yarn, the amount of tension being adjusted by varying the position of the weight.

In testimony whereof I have hereunto set my hand.

PERCY ASHWORTH.

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