

No. 826,859.

PATENTED JULY 24, 1906.

C. KELLNER.

MANUFACTURE OF THREADS FROM SHORT FIBERS.

APPLICATION FILED MAR. 21, 1904.

2 SHEETS—SHEET 1.

Fig. 1

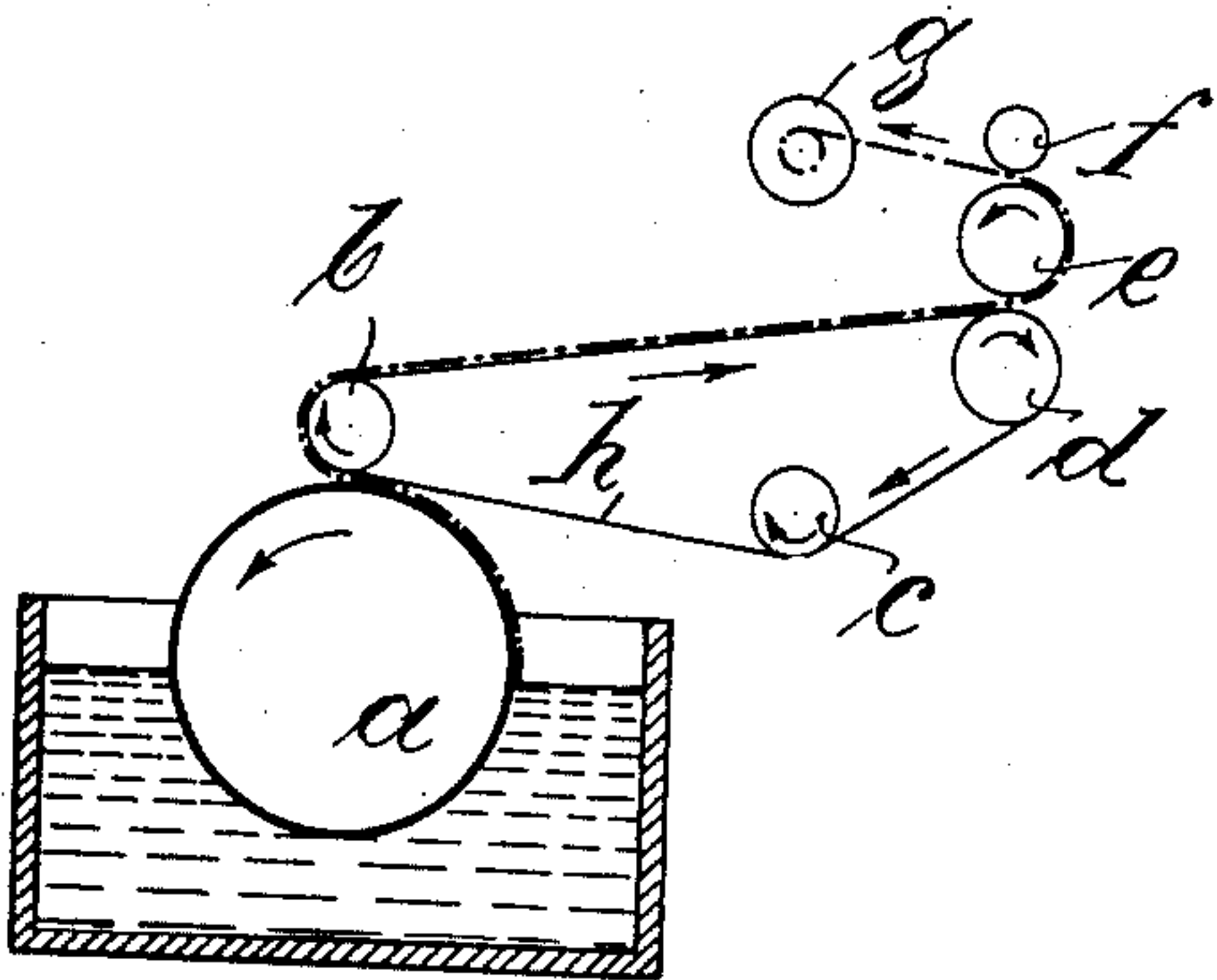


Fig. 2

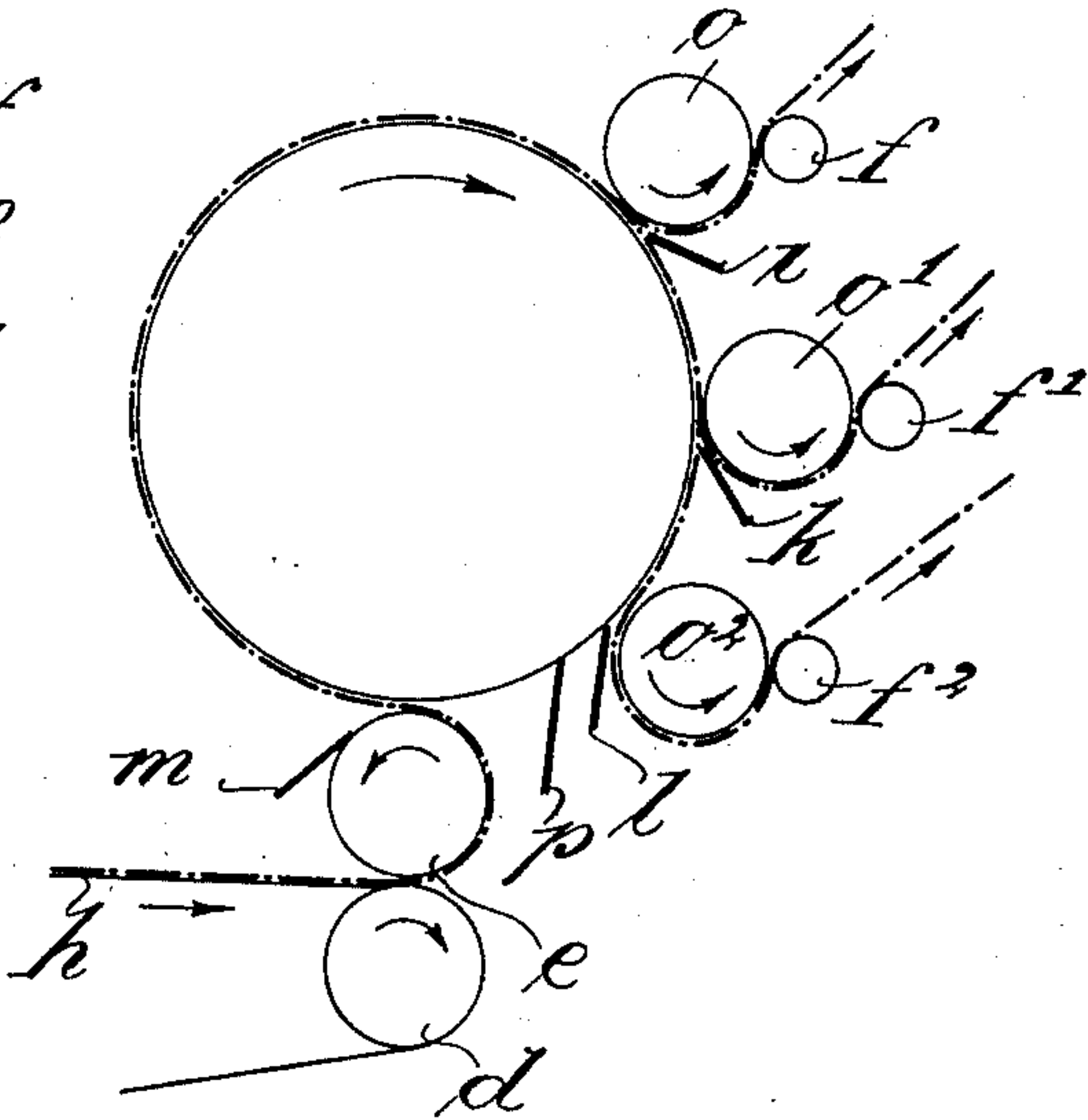


Fig. 1a

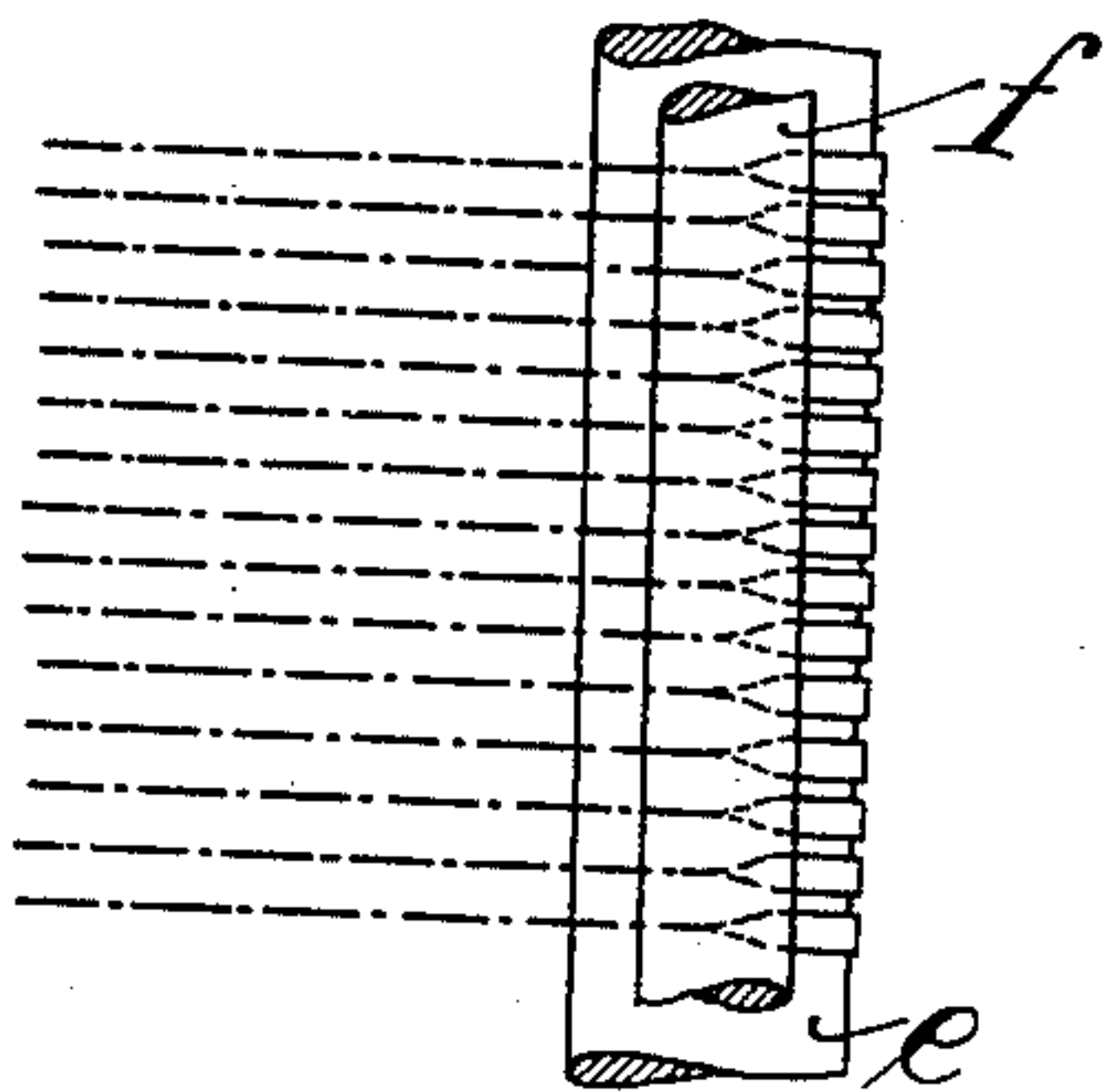
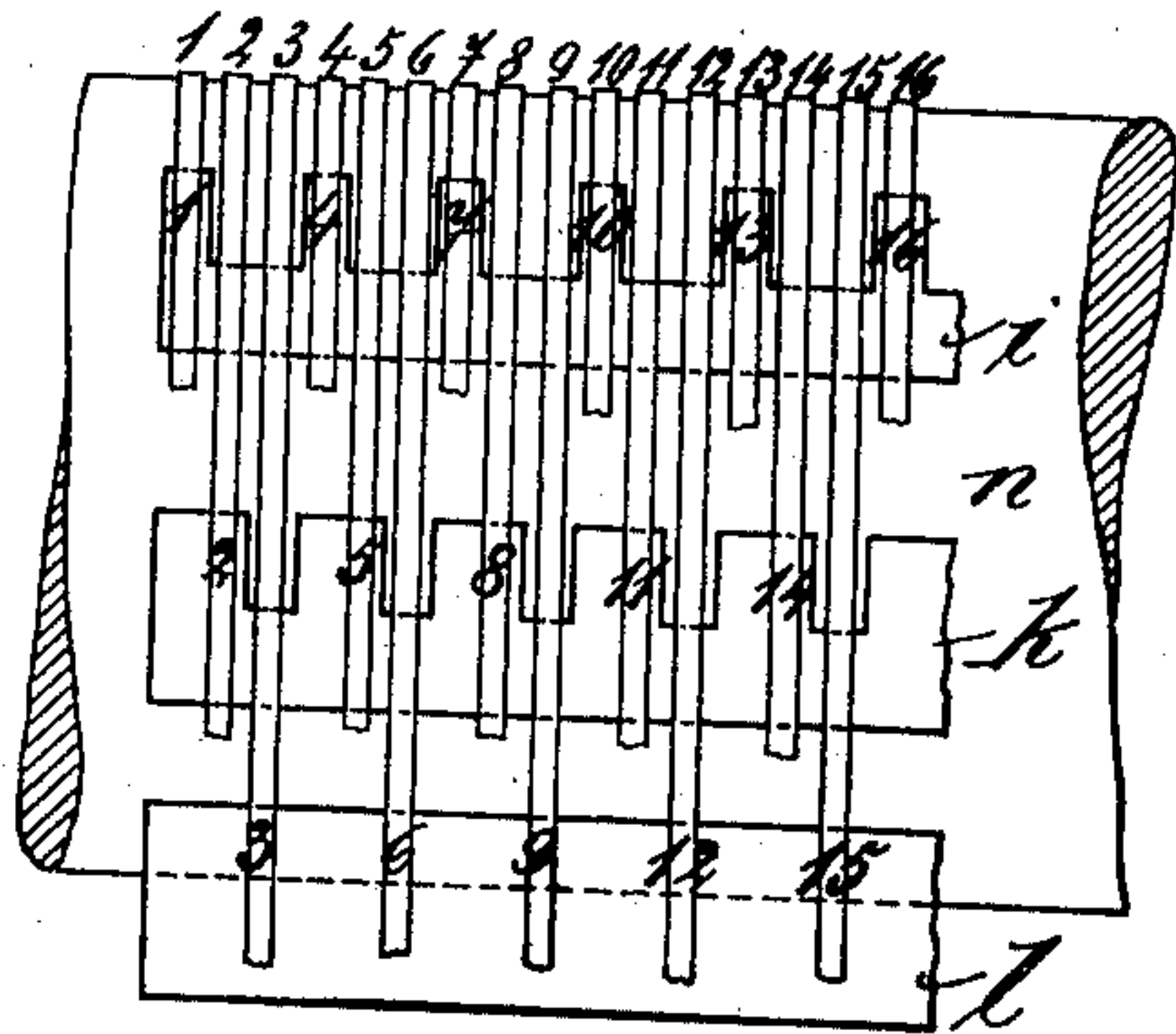


Fig. 2a



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2 SHEETS—SHEET 2.

Fig. 3.

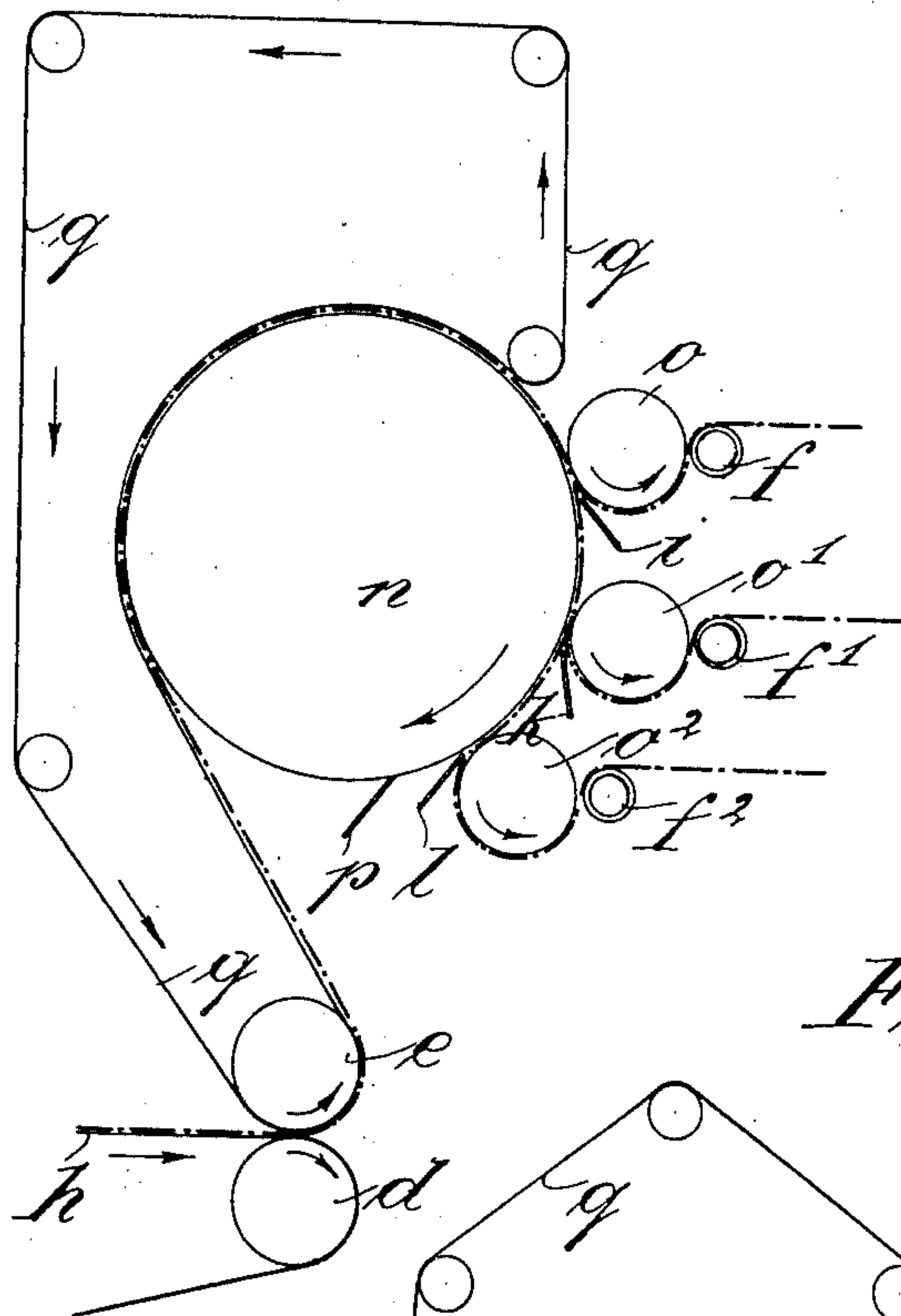
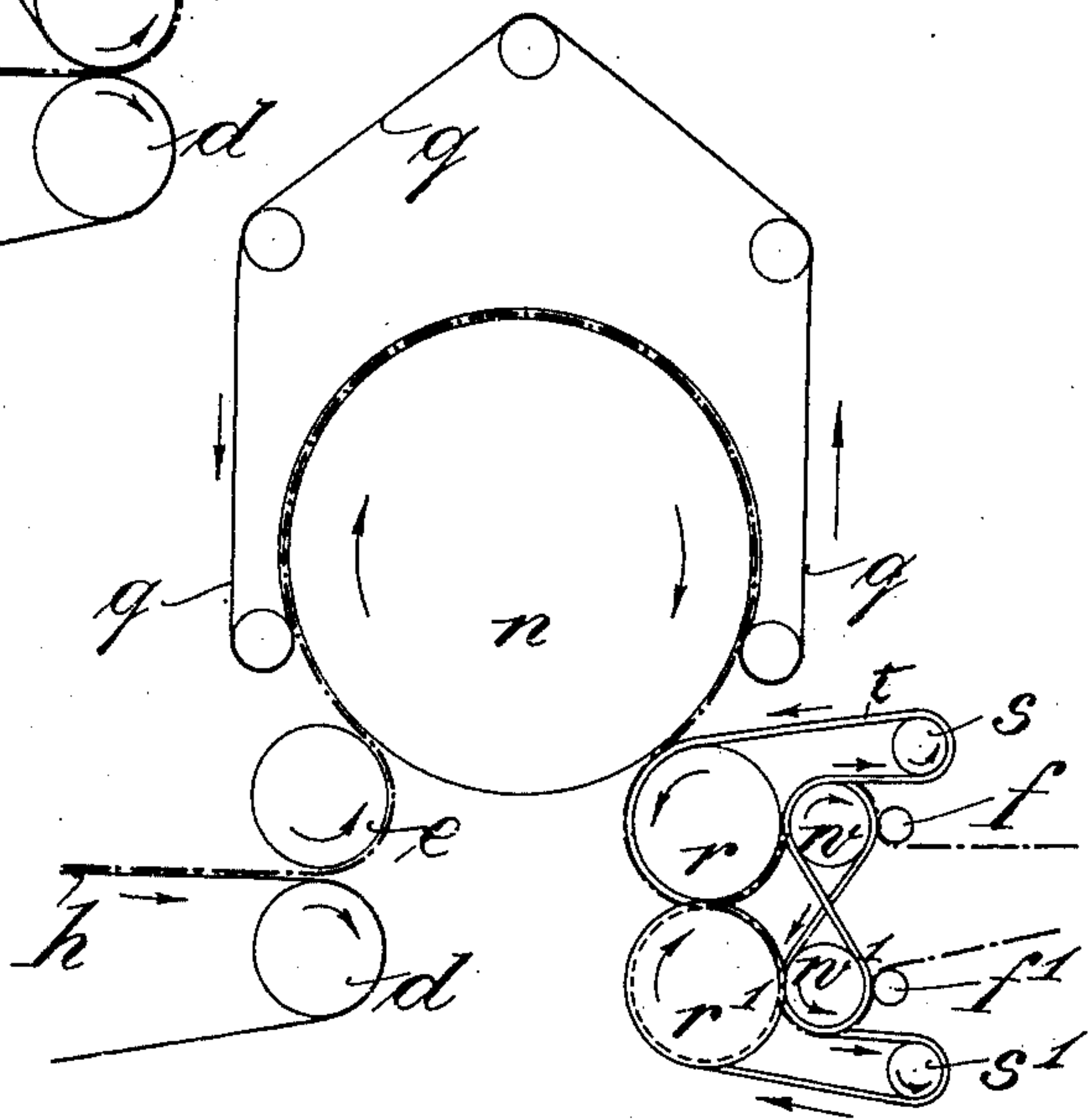


Fig. 4.



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UNITED STATES PATENT OFFICE.

CARL KELLNER, OF VIENNA, AUSTRIA-HUNGARY.

MANUFACTURE OF THREADS FROM SHORT FIBERS.

No. 826,859.

Specification of Letters Patent.

Patented July 24, 1906.

Application filed March 21, 1904. Serial No. 199,134.

To all whom it may concern:

Be it known that I, CARL KELLNER, a subject of the Emperor of Austria-Hungary, and a resident of 8 Borschkegasse, Vienna, in the Empire of Austria-Hungary, have invented certain new and useful Improvements in the Manufacture of Thin Threads from Short Fibers, of which the following is an exact specification.

My invention relates to improvements in the manufacture of thin threads from short fibers, and more particularly wood cellulose.

By means of the processes hitherto used for spinning materials consisting of short fibers it is not possible to make very thin threads on account of the fiber-felt fleece from which the yarns are made being so thin that it sticks to the press.

By the present invention this disadvantage is avoided and a process adopted by means of which very thin and equal threads can be made.

It is well known that the strength of the threads depends upon the relation between the diameter and the number of twists.

The present invention is of great importance especially when using very short fibers, as wood cellulose, (chemical wood-pulp,) as it renders it possible to manufacture not only very thin but also very strong and solid threads.

According to the present invention a very thin fleece of fiber felt is made upon the web of an ordinary endless web-paper machine or upon a cylinder paper-machine, and the fleece is divided into narrow strips of fiber felt. The latter operation can be effected by means of any convenient device—as, for instance, by using a web with impervious parts or by blowing air or water jets upon the pulp during the formation of the fleece or even by means of cutting edges, disks, combs, or the like. These strips are brought to a couching-press, roller-press, drying-cylinder, or the like. Upon the cylinder of this apparatus a roller is situated, which besides rotating moves to and fro in the direction of its axis. By this means a coarse roving of the strips takes place. The rovings are either wound upon collecting rollers or bobbins or are immediately brought to a finer roving-frame or to a spinning-machine. The rollers effecting the coarse roving are advantageously provided with a rubber mantle, which may be filled with compressed air.

In order to be able to utilize the whole

breadth of the machine, sieve, or wire-cloth, it is advantageous to arrange around the roller of the coucher, around the drying-cylinder, or around the suck-roller which supports the fiber strips several rows of rollers, each row being situated upon a special shaft, the roller situated upon the first shaft taking up, for instance, the first, fourth, seventh, tenth, &c., strips, the roller situated upon the second shaft taking off the second, fifth, eighth, and eleventh strips, and the roller situated upon the third shaft taking up the third, sixth, ninth, and twelfth strips. As mentioned above, these "take-off" rollers have besides their rotating movement also a to-and-fro movement in the axial direction, so that a nearly round section is given to the fiber-felt strips, avoiding tearing.

In order to make my invention more clear, I will proceed to describe the process with relation to the accompanying drawings, in which several modifications of the process are shown.

Figure 1 is a side view and a section in part of an apparatus according to my invention in a diagrammatical manner. Fig. 1^a is a fragmentary sectional plan view of Fig. 1 in enlarged scale. Figs. 2 and 2^a show a modification in side view and plan view, respectively; and Figs. 3 and 4 are two further modifications in side view.

In Fig. 1, *a* is an ordinary cylinder paper-machine whose sieve is provided with impervious parts, so that fiber-felt strips situated at a certain distance one from the other are produced. All these strips can be taken off and made round by the same roller. *b* is a small roller for guiding the endless band (felt) *h*. *c* is a tension-roller for holding the band *h* in tension. The rollers *d* and *e* form the couching-press. Upon the roller *e* a roller *f* is situated, which rotates and moves to and fro in the direction parallel to its axis. The fiber-felt strips formed upon the round sieve *a* are guided upon the endless band *h* to the couching-press—i. e., to the rollers *d* and *e*, forming the couching-press. The felt bands stick to the roller *e* and are guided between the rollers *e* and *f*. By the to-and-fro movement of the roller *f* the small strips are brought into a round form, as may be seen from Fig. 1. These round strips are either brought to a collecting-bobbin *g* or to a fine-roving frame or a spinning-machine. As the strips are brought into a round form they are strong enough to be freely manipulated.

In Fig. 2 a modified form of carrying the invention into effect is shown. In this modification the whole breadth of the web or sieve is utilized, which is not the case if impervious parts are provided in the sieve. In order to utilize the whole breadth of the web, the fleece formed upon the web must either at the moment of formation or after formation be divided or partly divided so that the single strips can be directly taken off or can be separated by means of suitable devices. In this modification the felt strips situated one directly at the side of the other one upon the endless wire-cloth or press-felt *h* pass the coucher *d* and *e* or the second press and are brought, by means of the blade *m*, to the drying-cylinder *n*. Upon the periphery of this drying-cylinder rollers *o o' o²* are arranged, upon which rollers the reciprocating rollers *f f' f²* are situated. The fiber-felt strips are brought by suitable blades *i k l* from the drying-cylinder *n* upon the rollers *o o' o²* and are then made round by means of the small rollers *f f' f²*.

In Fig. 2^a the working of the blades *i k l* is shown. It will be seen from this figure that the blade *i* takes the strips 1 4 7 10 13 from the drying-cylinder *n*, the blade *k* takes off the strips 2 5 8 11 14, and the blade *l* takes off the remaining strips 3 6 9 12 15. *p* is a blade which serves for cleaning the drying-cylinder.

In Fig. 3 the use of a drying-felt *g*, applied to the construction in Fig. 2, is shown. This drying-felt has the purpose of accelerating the drying of the single strips.

In Fig. 4 a modification of the apparatus is shown in which an unseparated fleece is manufactured, which after being dried to a certain extent is divided in single strips by means of steel bands *t*, running over the rollers *r* and *r'*. The steel bands are situated in grooves of the rollers *w w'*, upon which rollers the rollers *f*, which move to and fro in the direction of their axis, are situated. On account of two rollers *r* and *r'* and two separate devices *w f w' f* for making the strips round being provided the strips formed by dividing the fleece are separated one from the other by the first, third, fifth strip being guided around the upper rollers *r*, and the second, fourth, sixth strip being guided around the lower roller *r'*. *s s'* are rollers for guiding the steel bands *t*.

Having thus fully described the nature of my invention, what I desire to secure by Letters Patent of the United States is—

1. In a machine for manufacturing thin threads from short fibrous material, the arrangement of a roller immediately at the end and near the longitudinal sieve or also the roller-sieve for taking off the fleece divided in known manner into narrow strips from the sieve, a roller provided with a rubber mantle blown up arranged above that roller at a distance in accordance with the diameter of the threads to be formed, having a to-and-fro swinging motion parallel to its axle imparted to it in known manner, for rolling or rubbing the fleece strips to form threads or rovings, substantially as described.

2. In a machine for manufacturing thin threads from short fibrous material, the arrangement of a roller immediately at the end and near the longitudinal sieve in connection with a second roller between the sieve and the said roller for leading over the divided fleece to the said roller, different rollers arranged on the circumference of the said roller for gradually taking off the single strips as described, and rollers provided with rubber mantles blown up arranged on the latter rollers at a distance in accordance with the diameter of the threads to be formed, having a to-and-fro swinging motion parallel to the axles imparted to them in known manner, for rolling or rubbing the fleece strips to form the threads or rovings, substantially as described.

3. In a machine for manufacturing thin threads from short fibrous material, the arrangement of a roller immediately at the end and near the longitudinal sieve in connection with a second roller between the sieve and the said roller for leading over the divided fleece to the said roller, two rollers situated above each other, the upper one lying at the said roller and rotating reversely with the lower one, intermediate rollers and rollers provided with rubber mantles blown up arranged on the latter rollers at a distance in accordance with the diameter of the threads to be formed, having a to-and-fro swinging motion parallel to the axles imparted to them in known manner, for rolling or rubbing the fleece strips to form the threads or rovings, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CARL KELLNER.

Witnesses:

ALVESTO S. HOGUE.
AUGUST FUGGER.