(No Model.) 3 Sheets—Sheet 1.

F. V. M. RAABE.

APPARATUS FOR CONDENSING FIBROUS MATERIALS PREPARATORY TO SPINNING.

No. 549,018. Patented Oct. 29, 1895.

Fig 2.

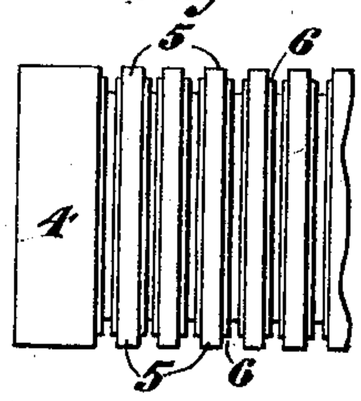

Fig 1.

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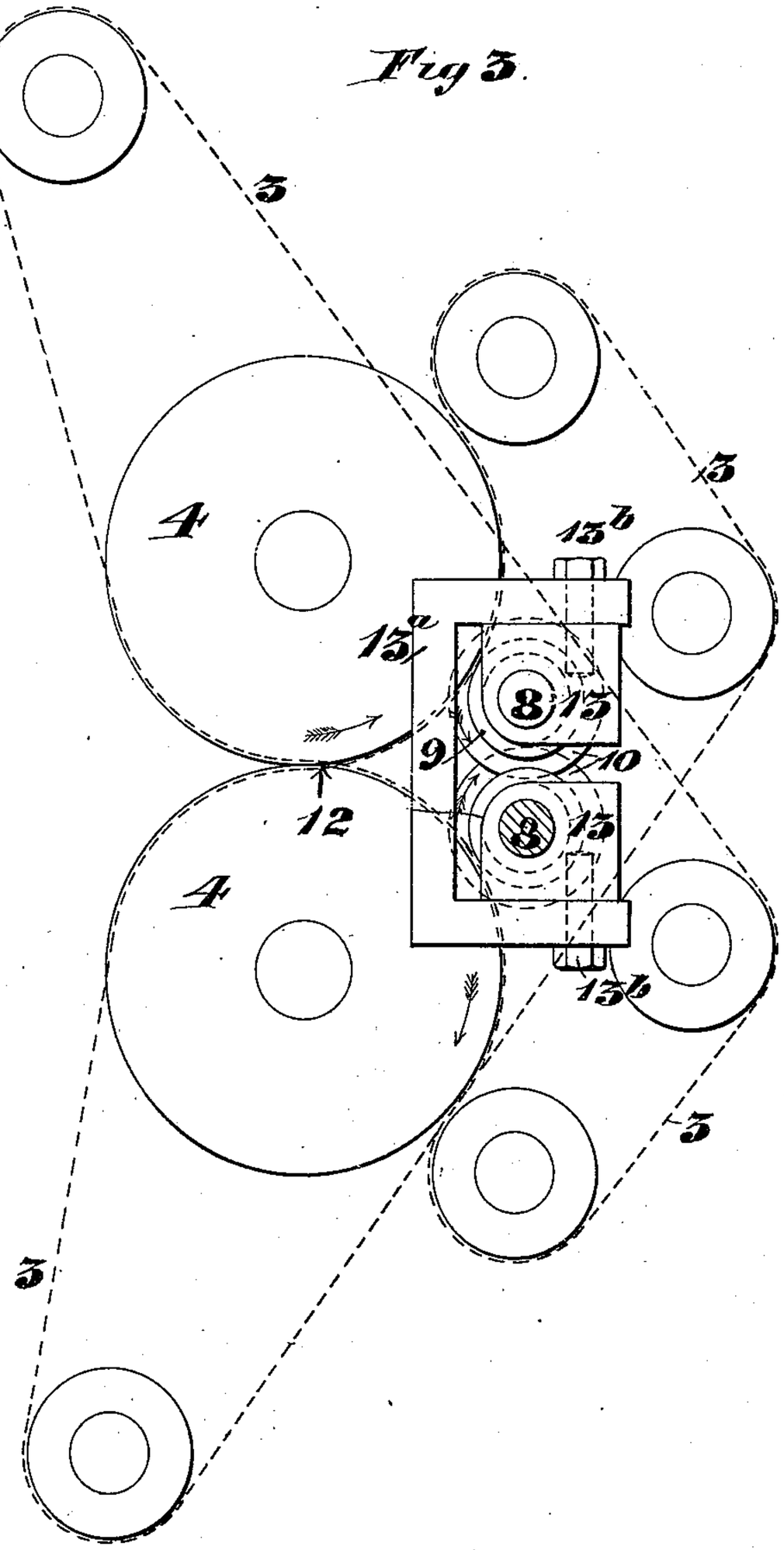
Fig 3.



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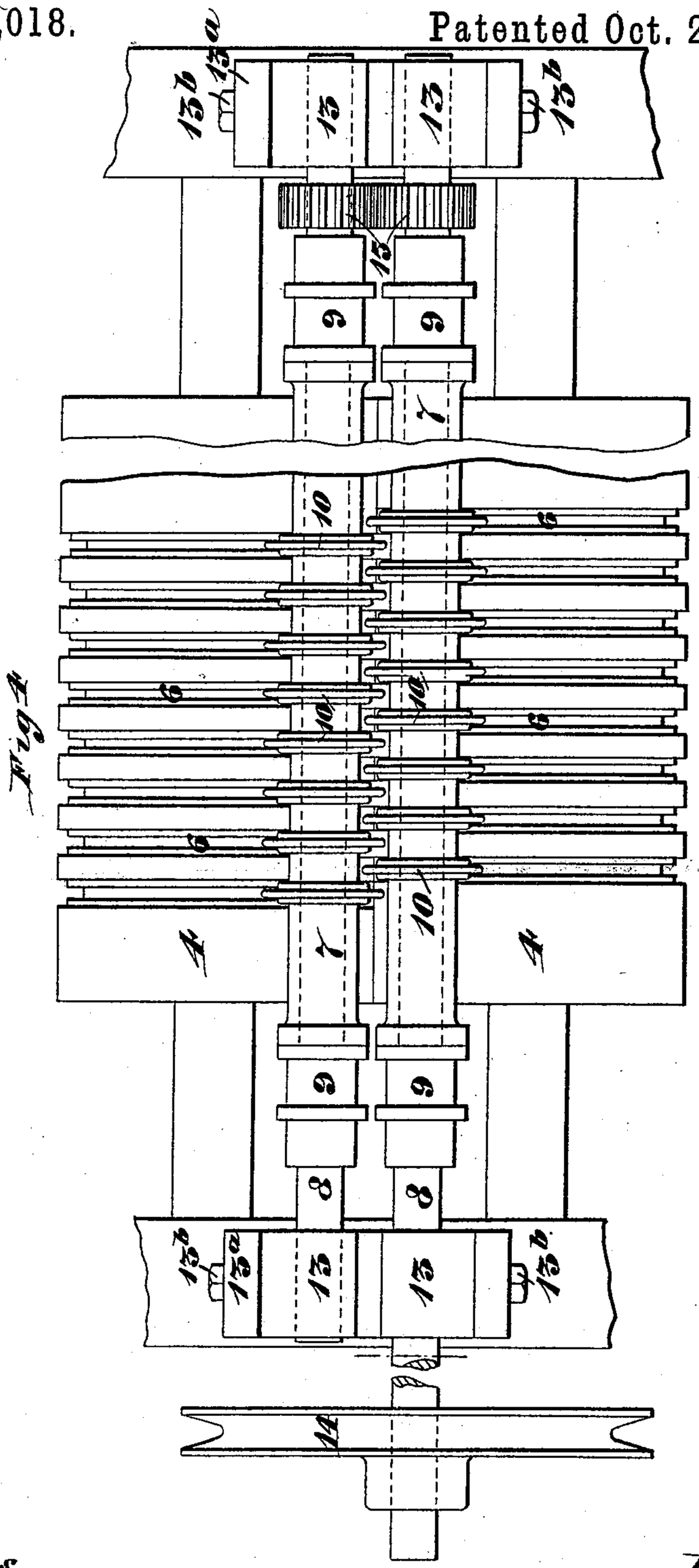

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UNITED STATES PATENT OFFICE.

FELIX VICTOR MAX RAABE, OF LONDON, ENGLAND.

APPARATUS FOR CONDENSING FIBROUS MATERIALS PREPARATORY TO SPINNING.

SPECIFICATION forming part of Letters Patent No. 549,018, dated October 29, 1895.

Application filed January 11, 1893. Serial No. 458,046. (No model.) Patented in England July 25, 1891, No. 12,678; in Germany December 9, 1891, No. 63,170; in France December 11, 1891, No. 217,996; in Belgium December 12, 1891, No. 97,548; in Austria-Hungary May 29, 1892, No. 6,601, and in Canada April 25, 1893, No. 42,757.

To all whom it may concern:

Be it known that I, FELIX VICTOR MAX RAABE, a subject of the Emperor of Germany, residing at Copthall Buildings, in the city of London, England, have invented Improvements in Apparatus for Condensing Fibrous Materials Preparatory to Spinning, (for which I have obtained Letters Patent in Great Britain and Ireland, dated July 25, 1891, No. 12,678; in the Dominion of Canada, dated April 25, 1893, No. 42,757; in France, dated December 11, 1891, No. 217,996; in Germany, dated December 9, 1891, No. 63,170; in Belgium, dated December 12, 1891, No. 97,548, and in Austria-Hungary, dated May 29, 1892, No. 6,601,) of which the following is a specification.

This invention has reference to improvements in apparatus for condensing fibrous materials preparatory to spinning.

In the accompanying drawings, Figure 1 is an elevation of apparatus heretofore used for condensing fibrous material, and Fig. 2 is a plan of part of one of the tape-cylinders used therein. Figs. 3 and 4 are respectively side and front views of apparatus for condensing fibrous material according to this invention.

As the perfect condensing or conversion of fibrous material into threads preparatory to spinning is of the greatest importance for the successful carrying out of the subsequent spinning operation, and as this condensing operation presents great difficulties, especially when dealing with very long fibers, many attempts have been made to construct an apparatus that would effect a perfect division of the material after the same had been properly prepared on the carding-engines. One of the best apparatus hitherto used for this purpose is shown in Figs. 1 and 2, in which the division of the web 1 of fibrous material coming from the doffer 2 of the condensing carding-engine is effected by means of leather tapes 3, which are placed crosswise on two cylinders 4, driven in opposite directions. The web is drawn between the tapes 3 and the cylinders 4 and by the crossing of the tapes is divided into as many uniform ribbons as there are leather tapes. In order to produce this division of the web, the surface of each cylinder is composed of a number of annular raised parts or projections 5 to carry the leather tapes and with intermediate grooves 6, the raised parts or projections and grooves being all of the same width and corresponding with that of the tapes. The cylinders 4 are so relatively arranged that the raised parts or projections of the one are opposite to the grooves of the other. Although this condensing apparatus has been specially constructed for treating long fibers, it has been found that owing to the great number of long fibers which some fibrous materials contain it does not produce an entirely perfect division of the web, as it frequently happens that such long fibers extend across several leather tapes and so cause entanglement and frequent breakage of the rovings, with the result that the rovings 1^a produced therefrom under these circumstances are faulty and offer great difficulties in spinning. To obviate this and produce a more perfect division of the web coming from the doffer of the condensing carding-engine, thereby rendering it possible to spin long fibers or fibrous material containing long fibers advantageously and into fine counts, I construct or provide a condensing apparatus of the kind referred to with a supplementary dividing apparatus, as shown in Figs. 3 and 4. This supplementary dividing apparatus comprises two hollow rollers, each formed or provided with a number of annular projections 10, which must be perfectly smooth and free from sharp edges, and are made to correspond in position and approximately in shape with the grooves 6 of the tape-cylinders 4. For convenience of manufacture I have shown the two rollers as made each of a number of tubular sections 7, each section (of which, however, only one is shown) being about six inches in length and secured upon a shaft 8 by means of nuts 9.

The annular projections 10 are intended to work in the grooves of the tape-cylinders 4, each of which cylinders is therefore provided with a dividing-roller, having as many annular projections 10 as there are grooves in the tape-cylinder.

In order to render the supplementary dividing apparatus effective, and at the same time

avoiding any disarrangement of the web before the same enters the rubbers 11, Fig. 1, it is necessary to rotate the supplementary dividing-rollers in the opposite direction to the corresponding tape-cylinders and to arrange them near those parts of the said cylinders 4 at which the divided web is tightly held between the leather tapes and the cylinders—namely, as near as possible to the crossing-point 12 of the leather tapes and on the delivery side of the cylinders 4, as shown.

By the onward movement of the tapes toward and past the annular projections of the supplementary dividing-rollers, which revolve in fixed bearings, all fibers extending across the space or spaces between the tapes will either be broken or pulled out by contact with the annular projections 10 of the dividing-rollers and carried toward the tapes, by which they are held in consequence of their onward movement past the side of the said projections, which are nearly of the same width as the spaces between the tapes. As the said supplementary dividing-rollers revolve in the opposite direction to the tape-cylinders, the clearing of the spaces between the tapes, and thus the division of the web, is effected in a most perfect manner. Owing to the dividing-rollers revolving, gathering of fiber therein is avoided.

The shaft 8 of each supplementary dividing-roller is carried in bearings 13, which are made adjustable on the bracket 13^a. This bracket is made with slots, through which pass the screws 13^b, by which the bearings can be fixed in order to properly adjust the dividing-rollers to the respective tape-cylinders. The bracket itself is also adjustable.

The supplementary dividing-rollers should revolve at a moderate speed to prevent the material from gathering round them. They may be driven from any suitable part—as, for example, from the swift of the carding-engine, to which the condensing apparatus is attached—as, for instance, by a groove-pulley 14, the two shafts being geared together by cog-wheels 15, as shown in Fig. 4.

From the above description it will be seen that condensing apparatus of the kind referred to instead of having one crossing-point only—viz., where the tapes cross each other at 12—will, when provided with supplementary dividing-rollers according to this invention, possess two dividing-points—viz., one where the leather tapes cross at 12 and one where the spaces between the leather tapes are cleared by the supplementary dividing-rollers 7. For this reason the apparatus will be more effective than other systems of condensing.

What I claim is—

1. For the purpose of condensing fibrous material, the combination with two oppositely rotating grooved cylinders and two series of endless tapes placed cross-wise on said cylinders, of supplementary dividing apparatus comprising two rollers each having a number of smooth annular projections arranged to work in the grooves of the corresponding tape cylinders substantially as herein described for the purpose specified.

2. In apparatus for condensing fibrous material, the combination with two oppositely rotating tape cylinders each formed with a number of alternate raised annular parts 5 and grooves 6, and two series of endless tapes 3 placed cross-wise on said cylinders, of supplementary dividing apparatus comprising two adjustable rollers each made in tubular sections 7 formed with annular projections 10 arranged to enter the grooves in the corresponding tape cylinders, and means for rotating said dividing rollers substantially as herein described for the purpose specified.

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

FELIX VICTOR MAX RAABE.

Witnesses:

CHARLES E. BROUGHAM,

WILLIAM CROSS.