

No. 637,543.

Patented Nov. 21, 1899.

A. WOLSTENHOLME.

RUBBING APRON FOR WORSTED DRAWING MACHINES.

(Application filed June 14, 1899.)

(No Model.)

Fig. 1.

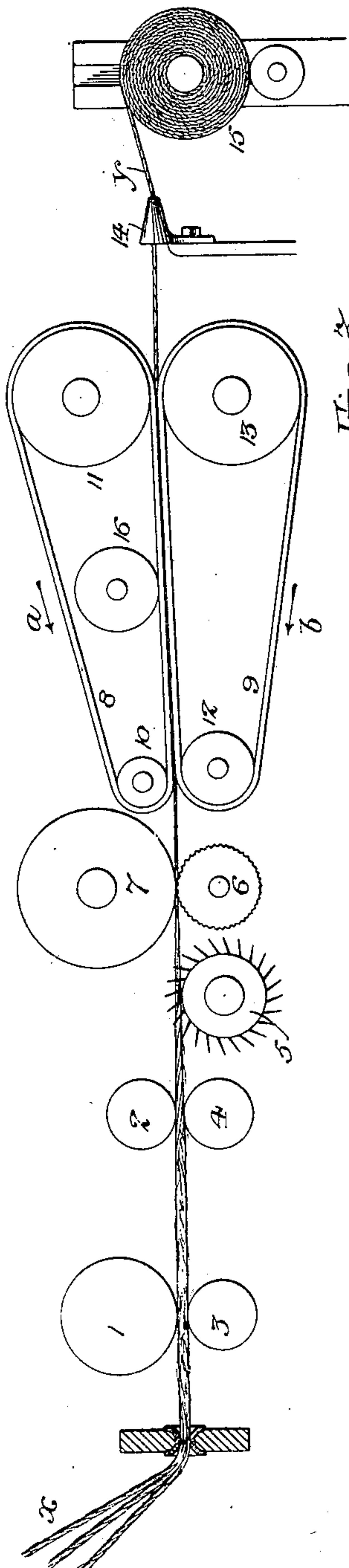


Fig. 2.

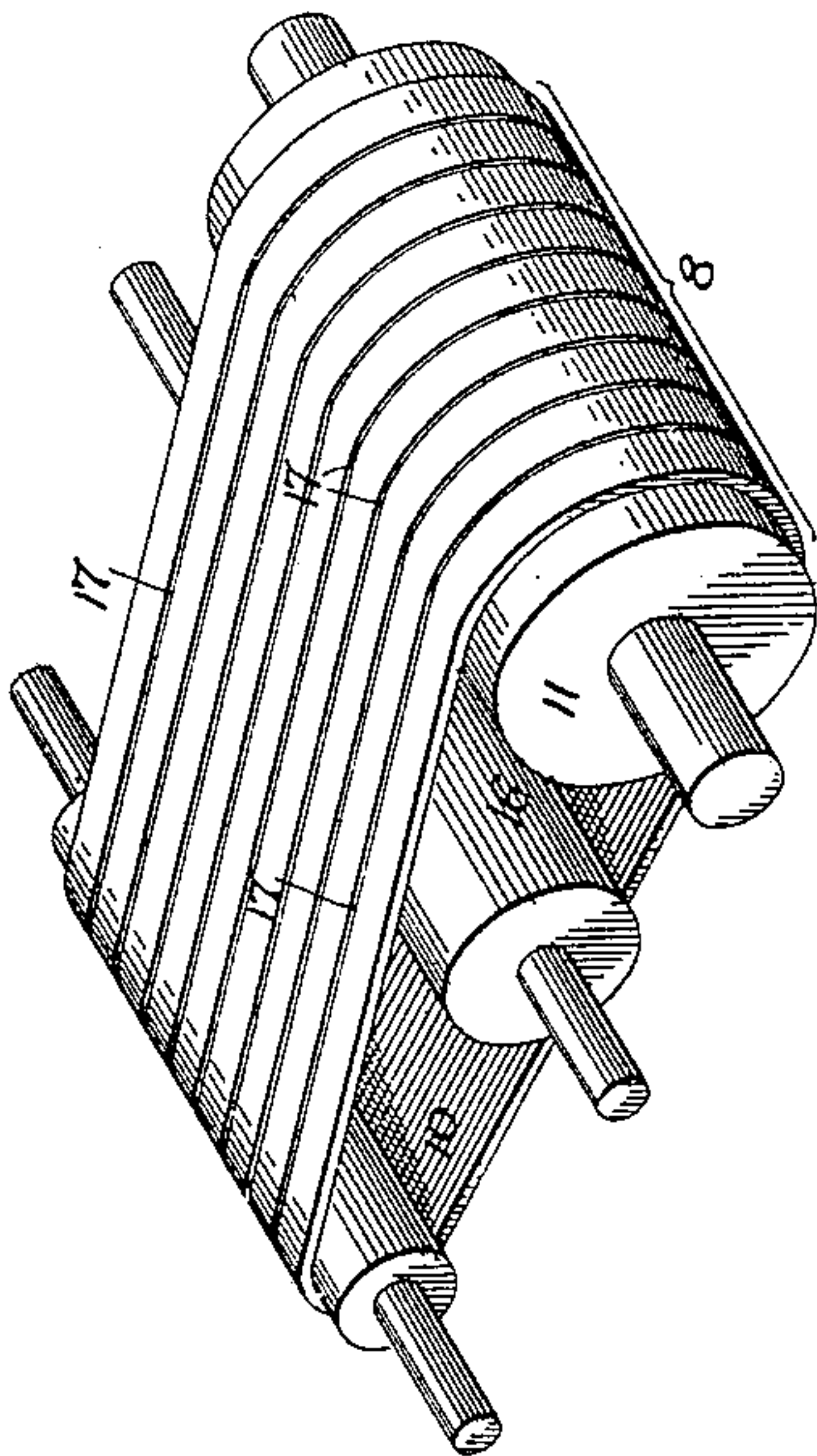


Fig. 3.

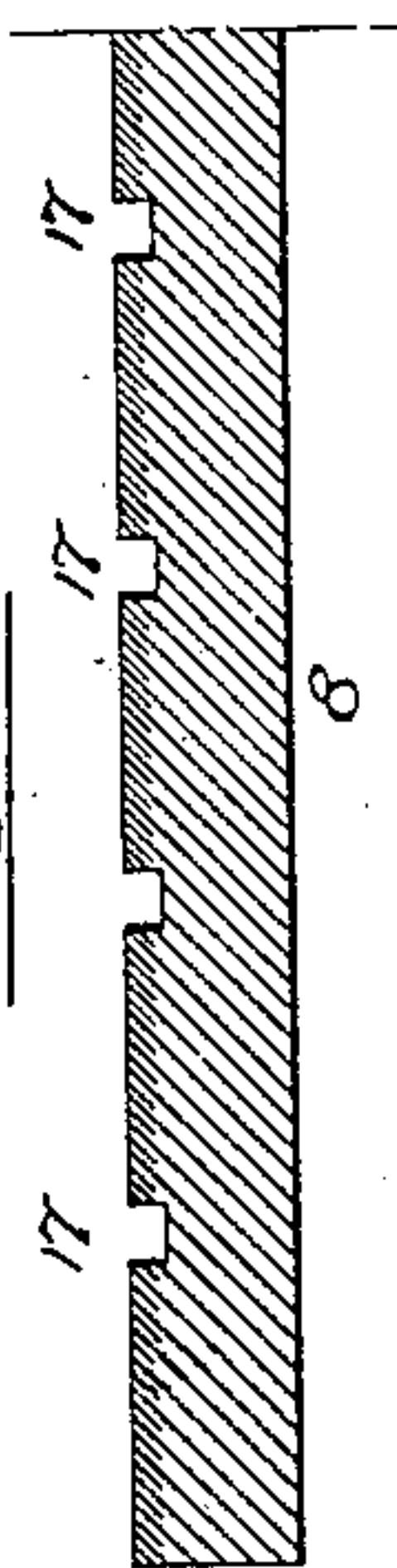


Fig. 4.

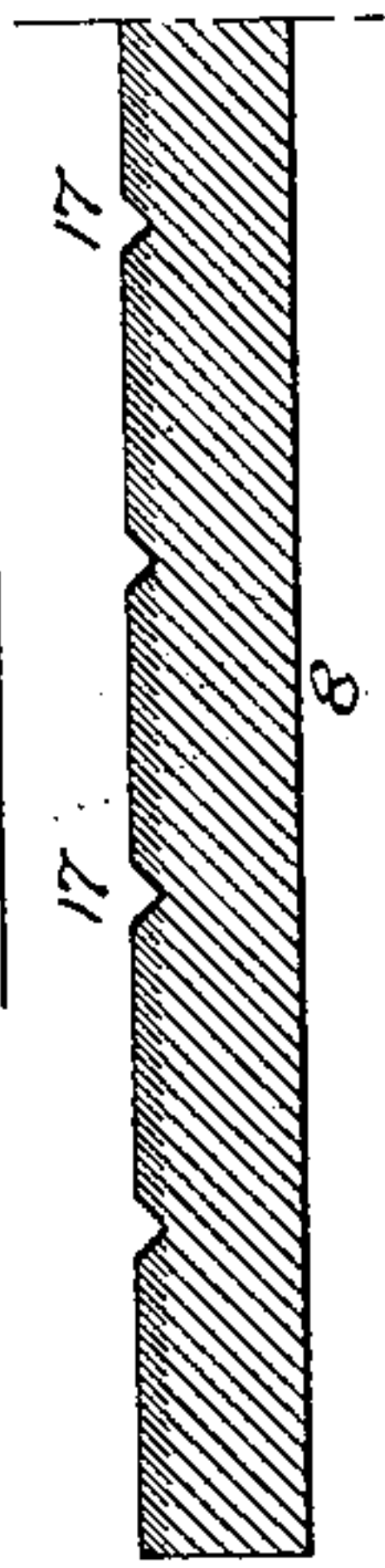
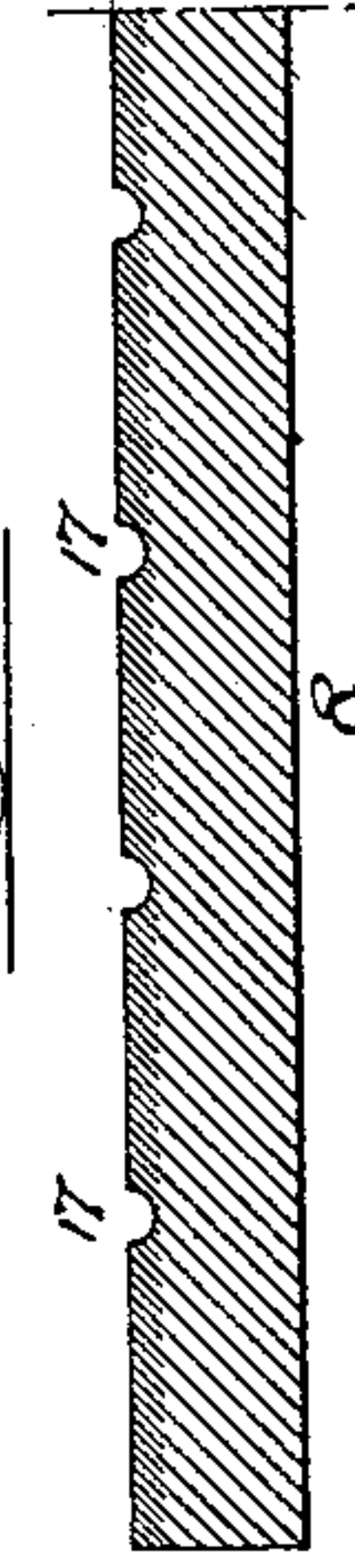


Fig. 5.



Witnesses:-

Charles DeBow  
John H. Whitehead.

Inventor:-  
Alfred Wolstenholme.

by his Attorneys:-  
Horsman & Horn



# UNITED STATES PATENT OFFICE.

ALFRED WOLSTENHOLME, OF PHILADELPHIA, PENNSYLVANIA.

## RUBBING-APRON FOR WORSTED-DRAWING MACHINES.

SPECIFICATION forming part of Letters Patent No. 637,543, dated November 21, 1899.

Application filed June 14, 1899. Serial No. 720,541. (No model.)

*To all whom it may concern:*

Be it known that I, ALFRED WOLSTENHOLME, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Rubbing-Aprons for Worsted-Drawing Machines, of which the following is a specification.

My invention relates to improvements in the process known as the "French system" of drawing used in the manufacture of worsted yarns, by which is meant all woolen yarns of fine texture and long staple, the invention consisting of an improved form of apron used for the rubbing or rolling and compressing of the worsted roving or sliver in this system of drawing.

My invention is fully shown in the accompanying drawings, in which—

Figure 1 is a diagram of sufficient of a machine for carrying out the process known as the "French system" of drawing, showing a pair of rubbing-aprons employed therewith. Fig. 2 is a perspective view of one of my improved rubbing-aprons. Fig. 3 is an enlarged sectional view of my improved rubbing-apron, and Figs. 4 and 5 are similar sectional views of modified forms of the rubbing-apron.

In the French system of drawing as hitherto carried out it has been the custom to employ rubbing-aprons having a uniformly-roughened surface. When leather aprons have been used, this surface has either been the natural flesh side of the hide, with the lumps or inequalities of the same removed, or if the grain side of the leather has been used it is buffed to give it the required roughness. Aprons composed of other material have been used; but in all instances such aprons have had a uniformly-roughened surface. The object of such roughened surface was to insure the proper rubbing or condensing of the rovings or slivers operated upon. In practice, however, these aprons have proved unsatisfactory, as after running for some length of time they develop two defects. In some instances the roughened surfaces tend to wear smooth and produce patches of surface having almost a glazed finish, which defeats the purpose for which they are employed, the sliver emerging from between the rubbing-aprons without any material change from the condition in which it entered the same, while

in other instances the surface of the aprons will wear rougher in parts and tear the slivers operated upon, making a very rough strand, besides collecting more or less of the fibers on the apron, thereby forming waste. In some instances the surface of the rubbing-aprons presents both of the defects just enumerated.

Having in mind the many defects and insufficiencies of the rubbing-aprons now in common use, I have devised the improved rubbing-apron forming the subject of this application.

My invention consists in grooving or indenting the smooth grain surface of a rubbing-apron whereby the same is adapted for the rolling and compressing of the worsted roving or sliver in the process known as the "French system" of drawing, the said grooves or indentations being made continuous and preferably in parallel lines.

The grooves or indentations which are formed in the grain surface of the rubbing-aprons may be of a width and depth sufficient to enable said aprons to perform the necessary amount of rubbing, rolling, and compressing commensurate with the bulk of the roving or sliver to be operated upon; but these grooves are generally uniform in width and depth for the entire extent of the apron, and I have found in practice that the best results are obtained with grooves of a width and depth of one-sixteenth of an inch disposed about three-eighths of an inch from the center of one groove to the center of the next adjoining groove, and there may be as many of such grooves as the width of the rubbing-apron may permit.

It is essential that the leather of which the improved rubbing-aprons are made shall present a natural close fine-grained surface, a condition which it should permanently retain while in use in contradistinction to the old kind of rubbing-aprons at present in common use, which to be effective require a semi-roughened rubbing-surface.

Fig. 1 of the accompanying drawings represents in diagram sufficient of a machine for carrying out the French system of drawing used for the manufacture of worsted yarns to illustrate the use of my invention. In the present instance three rovings or slivers are shown as being condensed into a single sliver



or roving  $y$ , which is wound on the bobbin 15. 1 and 2 are the upper drawing-rolls, and 3 and 4 are the lower drawing-rolls. 5 is the circular comb or porcupine for combing the condensed sliver into flat stock with the fibers arranged in parallel lines. 6 is a grooved draft-roller over which the stock passes and upon which is mounted the roll 7 for maintaining the stock in the flattened condition, and 8 and 9 are the aprons for rubbing the flat stock into a roving or sliver and giving it what I term a "mock twist." The upper apron is driven in the direction of the arrow  $a$  by the rolls 10 and 11, and the lower apron is driven by the rolls 12 and 13 in the direction of the arrow  $b$ , so that the meeting faces of the aprons will move in the same direction, the aprons at the same time being reciprocated laterally in different directions by the usual mechanism, so as to rub and twist the flat stock into a sliver. This sliver as it emerges from the rubbing-aprons is passed through the ordinary trumpet-eye 14 onto the bobbin 15. A roller 16 is arranged between the runs of the upper apron 8 and in contact with the lower run of the same so as to insure the contact of the meeting faces of the aprons 8 and 9, whereby the rubbing of the flat stock into a substantially round sliver will be accomplished.

In Fig. 2 I have shown a perspective view of the upper rubbing-apron 8 provided with a series of longitudinal parallel grooves 17, the space between the grooves being the smooth fine-grained surface of the leather. It will be understood that the lower rubbing-apron is grooved in the same manner as the upper apron.

In Fig. 3 I have shown a cross-section of a portion of the rubbing-apron on an enlarged scale, the smooth fine-grained surface of the same being indicated by the fine section-lines. In this apron the grooves 17 are substantially square.

In Figs. 4 and 5 I have shown modifications of the shape of the grooves in the rubbing-aprons, Fig. 4 showing a groove of triangular shape and Fig. 5 showing a groove of semicircular shape.

The grooves or indentations in the face of the rubbing-aprons insure the proper hold of said aprons upon the roving or sliver while it is being rubbed or rolled and compressed by means of the lateral reciprocating motion imparted by the machine to the rubbing-aprons, while the smooth grain surface of the leather has no tendency to cause fibers to become detached and adhere to the rubbing-aprons, an evil commonly known as "lapping" and which is unavoidable with the use of the ordinary rubbing-aprons, especially under certain conditions of the atmosphere.

The use of my improved rubbing-aprons does not require any change in any other part of the machine on which they may be employed. A great advantage gained by the use of the grooved rubbing-aprons is that the two roving-strands in process of rubbing or rolling are never entangled in that operation, but each individual strand is kept absolutely intact from the other, each one being discharged from the grooved aprons free from roughened or projecting fibers, being well rounded and compact and with no possibility of one strand becoming attached to its adjoining strand while both are being run together parallel and in contact through the same trumpet-guide onto the receiving roving-bobbin in front of the machine.

I am aware of the grooved rub roll or apron for condensing carding-machines, patented by Samuel H. Gidley, No. 480,088, dated August 2, 1892, and also the patent to James Barker for grooved rub roll or apron for condensing carding-machines, No. 489,281, dated January 3, 1893; but in each instance the apron shown and described by these patents was the ordinary carding-machine apron used for operating upon a fleece of uncombed wool, while the material which I operate upon is a sliver of combed stock having parallel fibers of long staple.

I do not claim, broadly, the idea or use of a grooved apron for the purpose of drawing or rubbing fibrous material; but

What I do claim, and desire to secure by Letters Patent, is—

1. As a new article of manufacture, a leather apron for use in the drawing or rubbing of rovings or slivers of worsted yarns, said apron having a smooth, close, fine-grained, unbuffed surface, and having on said unbuffed grain surface a series of grooves arranged longitudinally of the same, substantially as and for the purpose set forth.

2. As a new article of manufacture, a leather rubbing-apron for use in a machine for carrying out the French system of drawing or rubbing in the manufacture of long-fiber worsted yarns, said apron having a natural, close, smooth, fine-grained, unbuffed surface, and having on said unbuffed grain surface a series of parallel grooves or indentations, spaced at equal distances apart and arranged longitudinally of said apron, substantially as and for the purpose set forth.

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

ALFRED WOLSTENHOLME.

Witnesses:

CHARLES W. SPARHAWK,  
MURRAY C. BOYER.