(No Model.)

3 Sheets—Sheet 1.

E. GESSNER.

CLOTH NAPPING MACHINE.

No. 271,834. Patented Feb. 6, 1883.

Fig. 2.

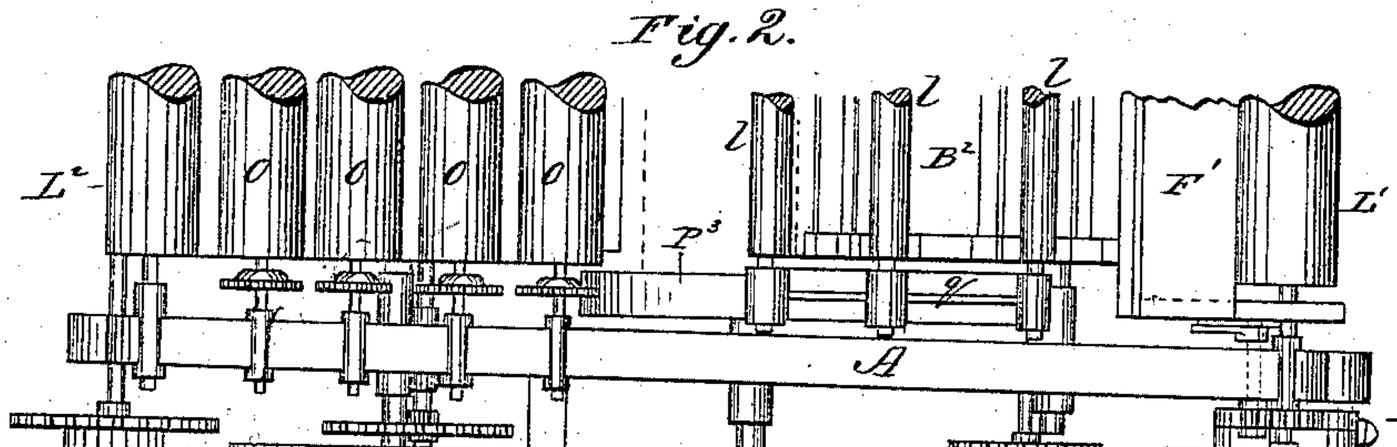
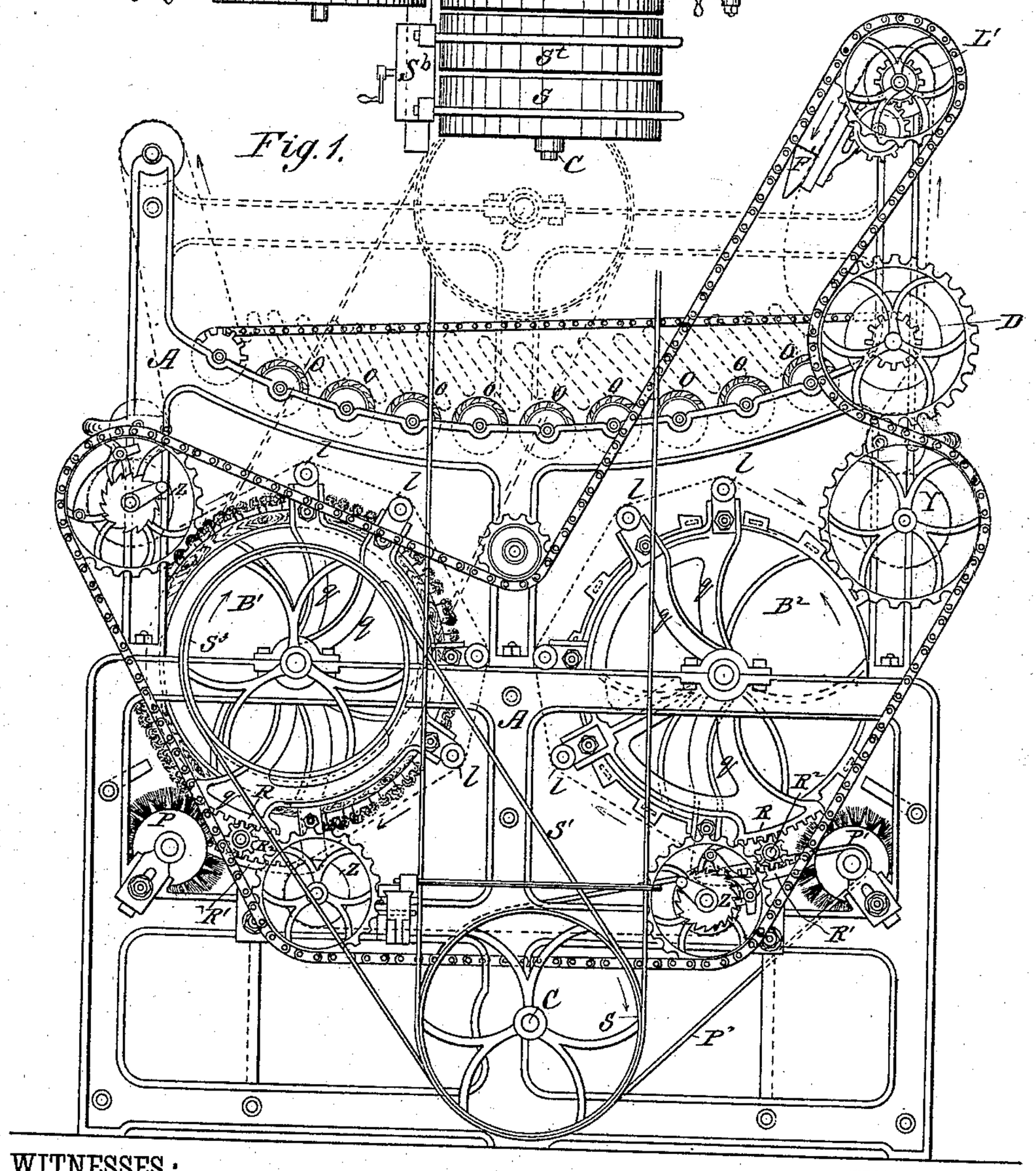


Fig. 1.



WITNESSES:

W. W. Hollingsworth

Edw. W. Byrn

INVENTOR:

E. Gessner

BY Munn & Co

ATTORNEYS.

(No Model.)

3 Sheets—Sheet 2.

E. GESSNER.

CLOTH NAPPING MACHINE.

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Fig. 4.

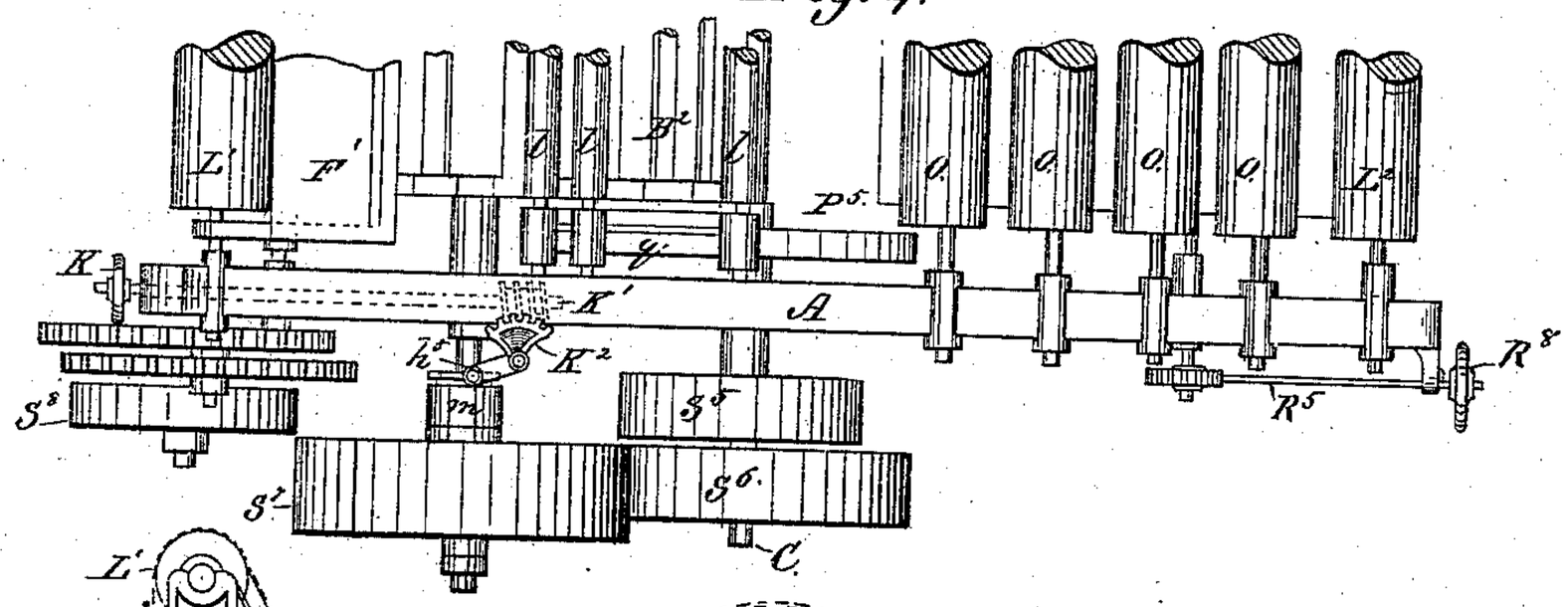
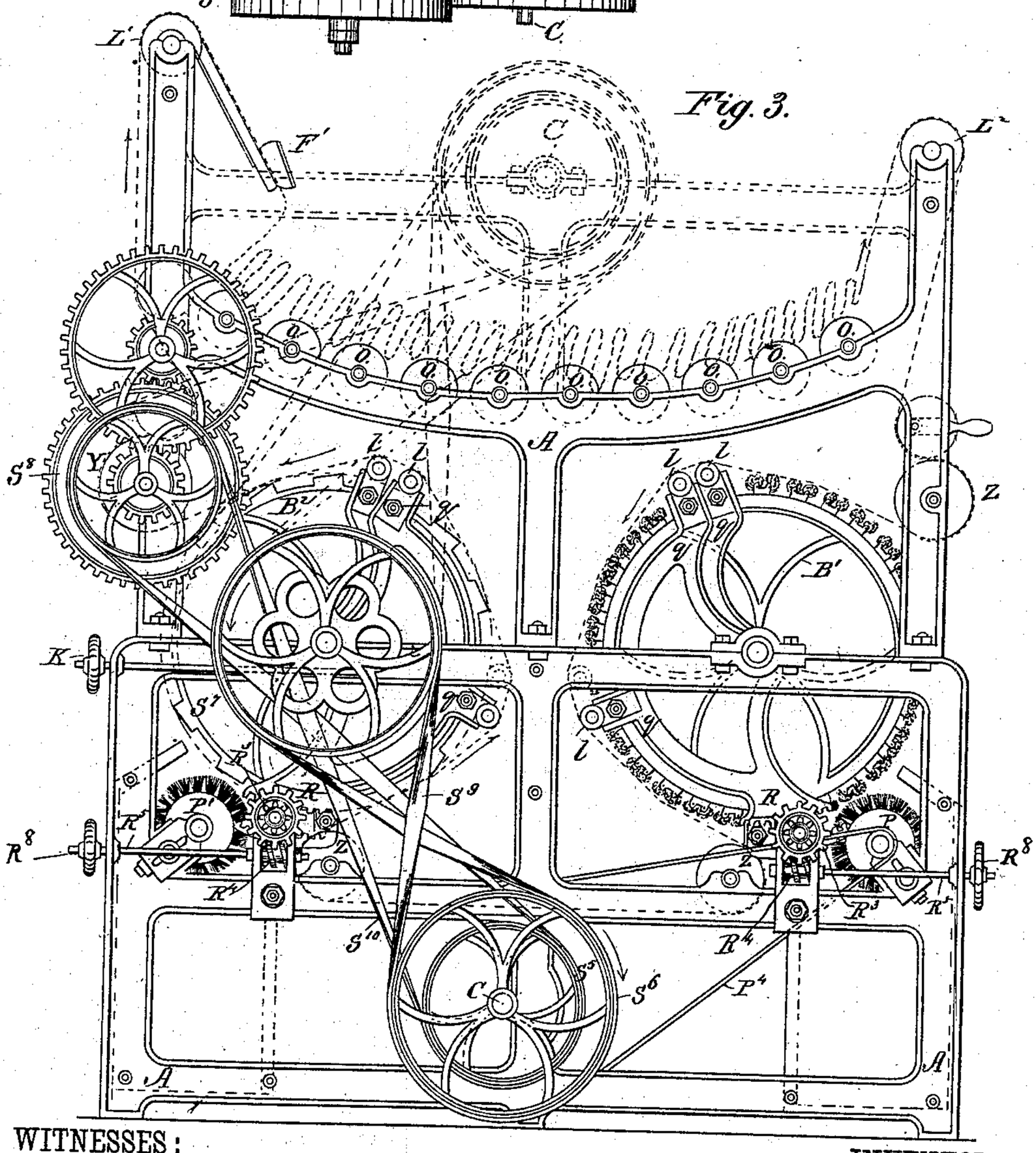


Fig. 3.



WITNESSES:

W. W. Hollingsworth

Edw. C. Byrn.

INVENTOR:

E. Gessner

BY Munn & Co

ATTORNEYS.

(No Model.)

3 Sheets—Sheet 3.

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CLOTH NAPPING MACHINE.

No. 271,834. Patented Feb. 6, 1883.

Fig. 5.

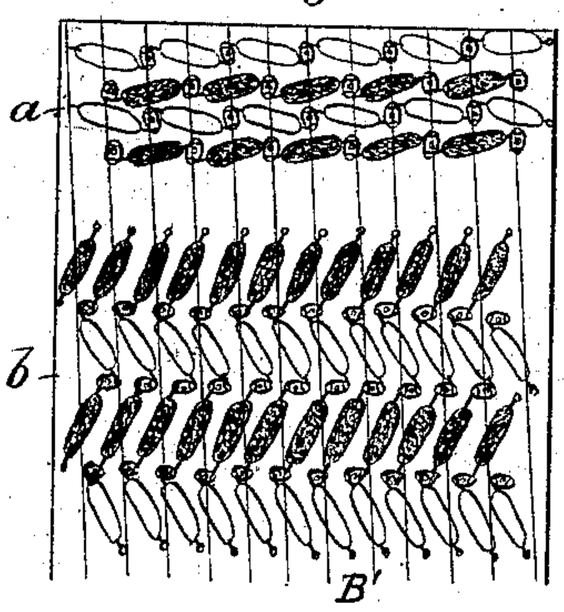


Fig. 6.

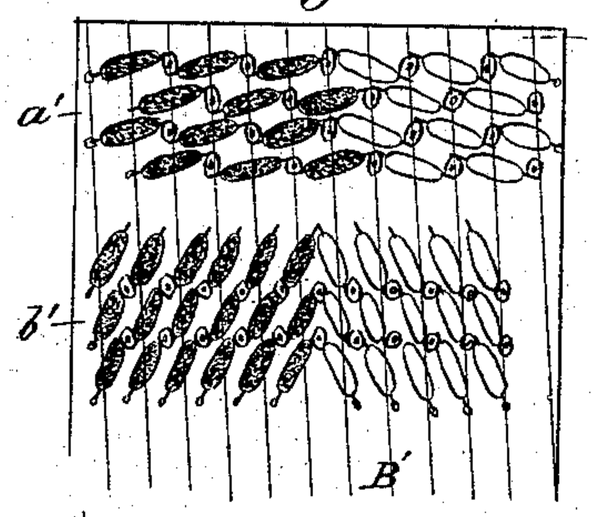


Fig. 7.

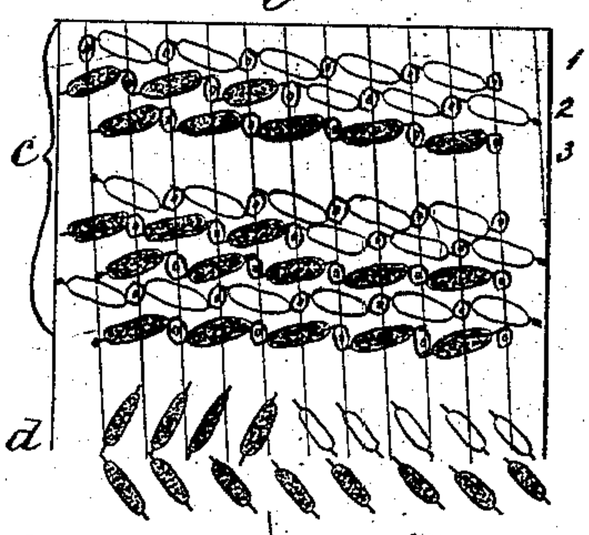


Fig. 8.

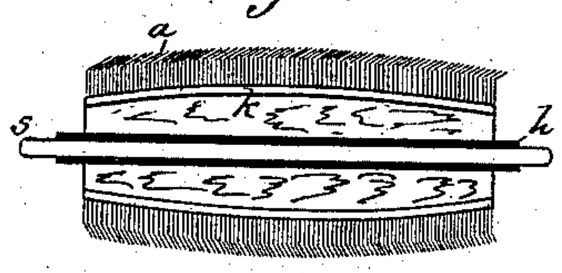


Fig. 9.

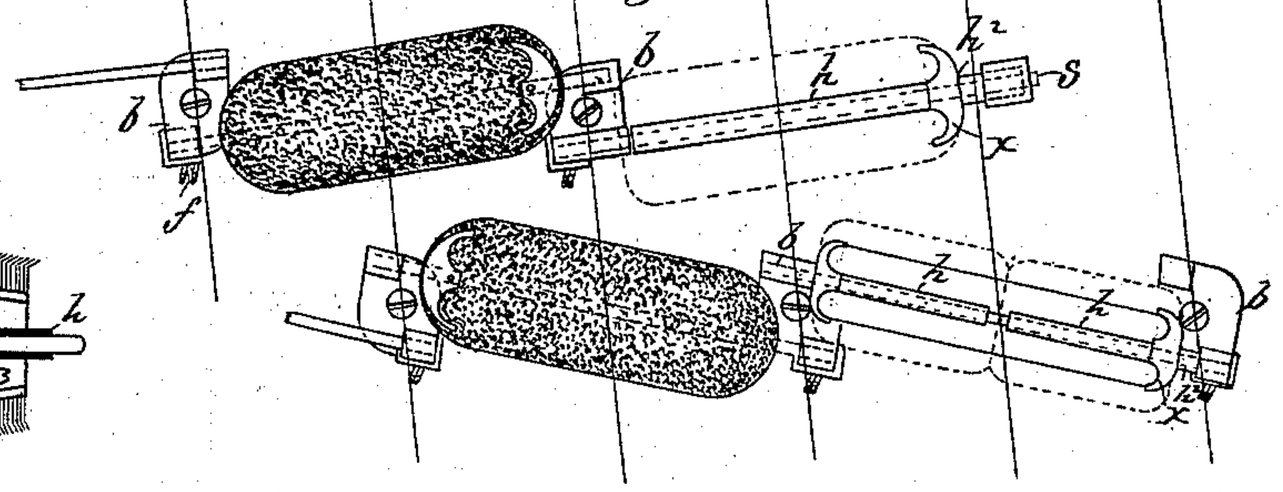


Fig. 10.

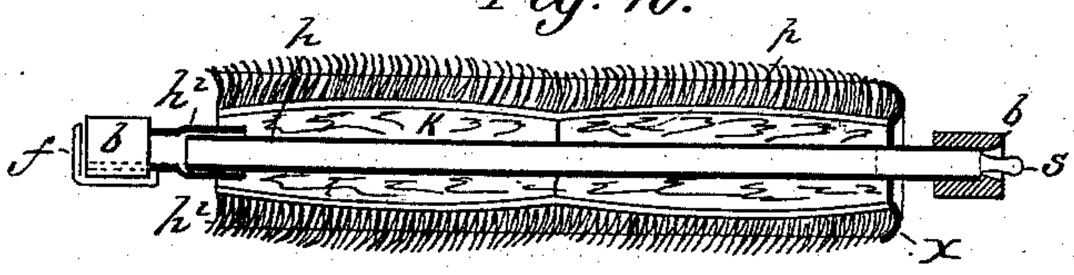


Fig. 11.

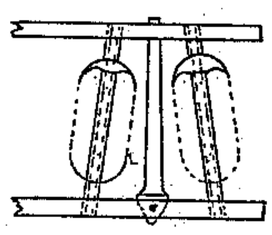


Fig. 12.

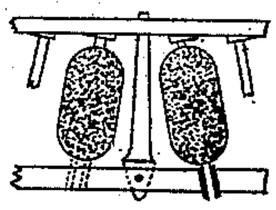


Fig. 13.

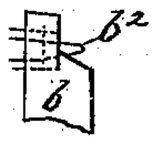
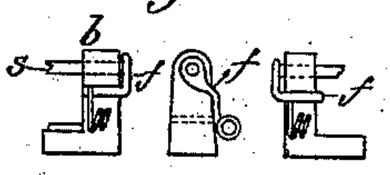


Fig. 14.



WITNESSES:

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Edw. W. Byrn.

INVENTOR:

E. Gessner

BY Munn & Co

ATTORNEYS.

UNITED STATES PATENT OFFICE.

ERNST GESSNER, OF AUE, SAXONY, GERMANY.

CLOTH-NAPPING MACHINE.

SPECIFICATION forming part of Letters Patent No. 271,834, dated February 6, 1883.

Application filed June 15, 1882. (No model.) Patented in Germany June 30, 1880, No. 16,700; in England April 26, 1881, No. 1,791; in Belgium August 30, 1881, No. 55,592, and in France September 16, 1881, No. 144,871.

To all whom it may concern:

Be it known that I, ERNST GESSNER, of Aue, in the Kingdom of Saxony, Germany, have invented a new and Improved Cloth-Napping Machine, (for which I have obtained Letters Patent in Germany, dated June 30, 1880, No. 16,700; in England, April 26, 1881, No. 1,791; in France, dated September 16, 1881, No. 144,871, and in Belgium, dated August 30, 1881, No. 55,592;) and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to gigs or machines for raising a nap on cloth by means of teasels.

The improvements consist, first, in the peculiar means for bringing the cloth into contact with one or both of the gig-cylinders or removing it therefrom without discontinuing the run of the machine; secondly, in the peculiar arrangement of the teasels on the cylinder to secure results hereinafter named; and, thirdly, in the means for holding the axial shafts of the teasels in their bearings, the said teasels being arranged to rotate freely on axial shafts or pins, as hereinafter described.

Figure 1 is an end elevation of one end of the machine. Fig. 2 is a plan view of the same end of the machine, the transport-rollers O O on the right, immediately above cylinder B^2, being removed to expose the top of said cylinder. Fig. 3 is an end elevation from the opposite end to that shown in Fig. 1. Fig. 4 is a plan view of the end shown in Fig. 3, the transport-rollers O O on the left, immediately above cylinder B^2, being removed to expose the top of said cylinder. Figs. 5, 6, and 7 show different arrangements of the teasels upon the cylinders. Figs. 8 to 12 show the construction and arrangement of the rotary teasels with respect to their axes and bearings. Figs. 13 and 14 represent means for holding the teasel shafts or pins in their bearings.

In the drawings, A represents the main frame, in middle horizontal position upon which are mounted the two gig-cylinders B' B^2. C is the main driving-shaft, which, as shown, is located at the bottom of the machine, but which may as well be located at the top of the machine, as shown by the dotted lines. This main drive-shaft has at one end (see Fig. 2) a loose pulley, S^t, and a tight pulley, S, from one to the other of which the driving-belt which conveys the motive power to the machine may be shifted by a belt-shifting fork, S^b. At this same end of shaft C there is keyed a pulley, S^2, which is connected to a pulley, S^3, on the shaft of the gig-cylinder B' by a belt, S', as shown in Fig. 1, which serves to give motion to said gig-cylinder. At the other end of the machine (see Fig. 4) the main shaft has two pulleys, S^5 and S^6, one of which, S^6, is connected to a pulley, S^7, on the gig-cylinder B^2 by a cross-belt, S^9, Fig. 3, and the other of which pulleys, S^5, is connected to a pulley, S^8, by a cross-belt, S^{10}. This pulley S^8 is on the shaft of the main draft-roller Y, (see Fig. 1,) which draws the cloth through the machine, and from which a positive motion is transmitted to the other draft-rollers, Z Z Z, by means of an endless chain gearing with sprocket-wheels on the ends of said rollers, as shown in Fig. 1. The same chain also drives the plaiting or cuttling-down mechanism L' F', and through a sprocket-wheel, D, imparts motion to a second chain that drives the transport-rollers O O, that carry the folds of the cloth at the top of the machine.

Just beneath the two gig-cylinders are two corresponding rotary cleaning-brushes, P and P', which serve to clear the flock and specks from the teasels. One of these brushes, P', receives its motion from a belt, P^2, Fig. 1, which passes around a pulley, P^3, Fig. 2, on the main shaft C, inside the frame A. The other one of these brushes, P, receives motion from the same shaft, C, at the opposite end of the machine, from a belt, P^4, Fig. 3, which passes around pulley P^5, Fig. 4, on said main shaft C. It will thus be seen that all of the moving parts of the gig receive motion from the same main shaft, C. The cloth, in running, passes (see dotted lines in Fig. 1) down at the left-hand side of the machine around draft-roller Z, thence over teasel-cylinder B', thence around draft-roller Z beneath cylinder B', thence to draft-roller Z beneath cylinder B^2, thence over teasel-cylinder B^2, thence to draft-roller Y, thence up and over the folding or cuttling down mechanism, thence over the trans-

port-rollers, and thence traverses again the same circuit.

For bringing the cloth into greater or less contact with the teasels, or for throwing it all together out of contact with one of the cylinders while the cylinder is still in motion, I hang upon the axis of each cylinder a set of segmental or semicircular frames, *q q*—two at each end of each cylinder. These frames carry the guide-rollers *l*, that extend parallel with the axis of the cylinder across the periphery of the same. One of these semicircular frames *q* of each set has at its outer edge an outwardly-projecting set of segmental teeth, R, and the other has an inwardly-projecting set of segmental teeth, R′, between and in gear with both of which is a toothed pinion, R^2. (See Figs. 1 and 3.) At one end of the machine (see Fig. 3) the shaft bearing these pinions has a worm-wheel, R^3, into which gears a worm, R^4, on a shaft, R^5, projecting from the machine, and provided with a hand-wheel, R^8. Now, by turning this hand-wheel it will be seen that the pinion R^2, Fig. 1, is rotated, and the frames *q q*, by reason of these reversely-geared segmental teeth R and R′, are turned in opposite directions, so as to bring the roller *l* of the two frames into close proximity, as shown in Fig. 3, or remote from each other, as shown in Fig. 1. When the guide-rollers *l l* are adjusted close to each other, as in Fig. 3, it will be seen that the cloth then passing in a straight line from the outer edge of one pair of rollers *l l* to the outer edge of another pair of rollers *l l* strikes tangentially the teasels on the cylinder, and is operated upon thereby, having in its passage over the cylinder three contacts therewith. When, however, the rollers *l l* are adjusted away from each other, as in Fig. 1, the distribution of the rollers under the cloth is such as to throw the cloth entirely out of contact with the cylinder, and any intermediate position between that shown in Fig. 1 and that shown in Fig. 3 may be employed to give a greater or less bearing and a greater or less contact of the cloth with the teasels. While this result is obtained, moreover, it will be seen that the cloth is kept in the same tension and the length of the cloth remains the same. With respect to this feature of my invention, I would state that it is not new to adjust the rollers or bearings for the cloth peripherally about the center of the cylinder when the cloth is run between the said roller or bearing and the cylinder, so as to regulate the extent of surface which shall be in contact with the cylinder; but in this case the cloth cannot be removed from the cylinder by said adjustment. On the other hand, I am aware that the cloth has been run upon the outside of the rollers or bearings on the cylinder where said rollers or bearings were adjusted radially; but in this case, in bringing the cloth into greater or less contact with the cylinder, it was made to travel an increased or diminished distance around the cylinder, and this involved in said adjustment a variation in the tension or run of the cloth, drawing it lengthwise and tightening it when the rollers were projected outward, and slackening it when the rollers were drawn in. By making the rollers adjustable peripherally about the cylinder and also arranging them inside the cloth or between the path of the cloth and the cylinder, I am enabled to bring the cloth into more or less bearing with the cylinder or throw it out altogether without disturbing the uniform tension or run of the cloth.

The arrangement of frames *q q* can be modified by making only one of the frames adjustable and the other stationary; or, instead of rollers *l*, plain rods can be used.

In some cases it may be desirable to discontinue the rotation of one of the gig-cylinders—the cylinder B^2, for instance. For this purpose a shaft, K, with a hand-wheel, (see Figs. 3 and 4,) is arranged in bearings in the frame A, and is provided at its inner end with a worm, K′, which engages with a toothed segment, K^2, which has a rigid forked arm, h^5, provided with pins that rest in a groove of a friction-clutch section, *m*. Whenever this clutch-section is engaged with the clutch-section of the pulley S^7, (see Fig. 4,) the cylinder B^2 revolves; but when the clutch-section *m* is removed from the clutch-section of pulley S^7 by the action of segment K^2 and worm K′ the pulley S^7 revolves loosely on its shaft and the cylinder B^2 remains at rest.

In mounting or fastening the teasels on the cylinder they may be either arranged upon independent supports, as shown on cylinder B′, or they may be arranged in slats in the usual manner, as on cylinder B^2.

Figs. 5, 6, and 7 show different positions of teasels arranged in independent supports, the views representing the surface of cylinders developed on a plain surface.

At *a* and *b* are shown teasels with their rows parallel to the cylinder-axis and extending across the face of the cylinder, also a reversed inclination of the alternate rows, *a* showing one degree of inclination of the teasel-axis and *b* another. This method of arranging teasels on a cylinder involves an objection, for the cloth not being distended transversely, it is liable to become striped in the nap.

At *a′* and *b′* is shown another method of arranging the teasels. Here the inclination of the teasels on one side of the middle peripheral line of the cylinder is reversed to that of the teasels on the other side of said line, and the rows of teasels of one inclination are only half the length of those shown at *a* and *b*. The teasels thus arranged make a transverse pull in opposite direction on the cloth and avoid the striping, which is one advantage; but it involves this objection, that the nap of one half of the cloth is raised in one direction and the other half in the opposite direction. To preserve the advantages of each of these methods without the objections of either, I combine them, as shown at *c* and *d*. Thus, at *c*, I have the first row of teasels like *a*, the teasels ex-

tending in a row of the same inclination across the face of the cylinder. The second row at *c* I have like *a'*, in which the short rows have a different inclination on opposite sides of a middle peripheral line. Then the next row is like *a*, and so on. The same combination of groupings of *b* and *b'* is shown at *d*, where the teasels simply have a greater inclination. In both these groupings *c* and *d* it will be seen that there is a predominance of teasels of a given inclination on one side of a middle peripheral line and a predominance of teasels of a reverse inclination on the opposite side of said middle peripheral line, which gives a transverse tension to the cloth, and yet there is no definite middle peripheral line where the nap is parted, as it would be at *a'* and *b'*.

I will now proceed to describe the manner of mounting the teasels on the cylinder. Instead of fixing them in immovable position, which exposes only one side to contact with the cloth, I arrange them to rotate freely upon an axis. The advantages of this are apparent, as it distributes the wear around the whole periphery of the teasel, allows the points or hooks to enter and leave the cloth without breaking, and raises a better nap with less violence to the material acted upon and in a quicker time, as it permits a higher speed. It also preserves the teasels, thus avoiding the necessity for frequent renewals, and makes a more uniform and regular napping action.

The teasels may be either the natural teasel or an artificial teasel, as shown in Fig. 8, in which *k* is a wooden core covered with card-clothing, and they may either be arranged fixedly upon a pin, *s*, which revolves with the teasel, or the teasel may have a tubular bushing, *h*, which, with the teasel, turns loosely on the said pin *s*, which latter in that case is fixed or dead in the bearings. The pin *s* or bushing *h* has a half-round cap, *x*, at one end, in order to hold or keep the teasel without injuring the end of it. The ends of the pin *s* are sustained either in bearings *b*, which are secured to the periphery of the cylinder, or they may be sustained in frames, as in Figs. 11 and 12. For holding the teasel-pins *s* in their bearings, one end, b^2, is flattened (see Figs. 10 and 13) and projected through a slot in the bearing *b* that holds it rigid against turning. The other end of said pin is held in its bearing by a spring-clip, *f*. (See Fig. 14.) In order to prevent dust or flocks of wool adhering to the ends of the pins or brushes, I cover both ends of the pins with short bushes h^2, (see Figs. 9 and 10,) which rest on the bearings *b* and reach close to the bush *h* in the middle, or to the teasel if there be no bush, so that no part of the pin is exposed. If desired, the bushings h^2 may be made in the form of a cap arranged to inclose the bushing *h* of the teasel, as shown on the left of Fig. 10, which still more effectually excludes the dust and flock. Instead of one teasel on each pin, furthermore, I may use two or more, as shown in dotted lines in Fig. 9 and in full lines in Fig. 10, which teasels are held together by a thread, *p*.

I do not claim broadly the mounting of a teasel upon an axial pin or shaft so as to revolve, but only the combination, with the same and its axial pin and bearings, of a spring-clip for holding it in its bearings and permitting its ready removal, and the dust-excluding bushings, as hereinbefore described.

Having thus described my invention, what I claim as new is—

1. The combination, with the napping-cylinder, in a cloth-napping machine, of the bearings *l l*, arranged parallel to the axis of the cylinder and between the path of the cloth and the cylinder, and means for adjusting said bearings peripherally about the center of the cylinder closer to or farther from each other, as described.

2. The combination, with the napping-cylinder in a cloth-napping machine, of the two frames *q q* at each end of the cylinder, the intermediate bearings, *l l*, for the cloth, arranged parallel to the axis of the cylinder, the two frames *q q* being hung upon the cylinder-shaft, and provided respectively with outwardly-projecting teeth R and inwardly-projecting teeth R', and an intermediate pinion, R^2, with means for rotating it, substantially as described.

3. The combination, with the rotary teasels and their bearings, of their central axial pin, *s*, and dust excluding bushings h^2, arranged between the teasels and their bearings, as shown and described.

4. The combination, with the teasel-bearings, the rotary teasel, and its axial pin *s*, of a spring-clip, *f*, for holding the teasel-axis in its bearing, substantially as described.

5. The method of arranging teasels on a gigging-cylinder, which consists in disposing them partly in short rows on opposite sides of a middle peripheral line of the cylinder, which short rows are of reversed inclination on opposite sides of said middle line, and disposing the other portion in long rows extending across the middle peripheral line, which long rows are of reversed inclination to each other, whereby a transverse tension is preserved in the cloth to prevent striping and the parting of the nap in the middle is avoided, as set forth.

This specification of my invention signed by me the 22d day of March, 1882.

ERNST GESSNER.

Witnesses:
A. NOEZOLD,
ERNST FRITZSOHE.