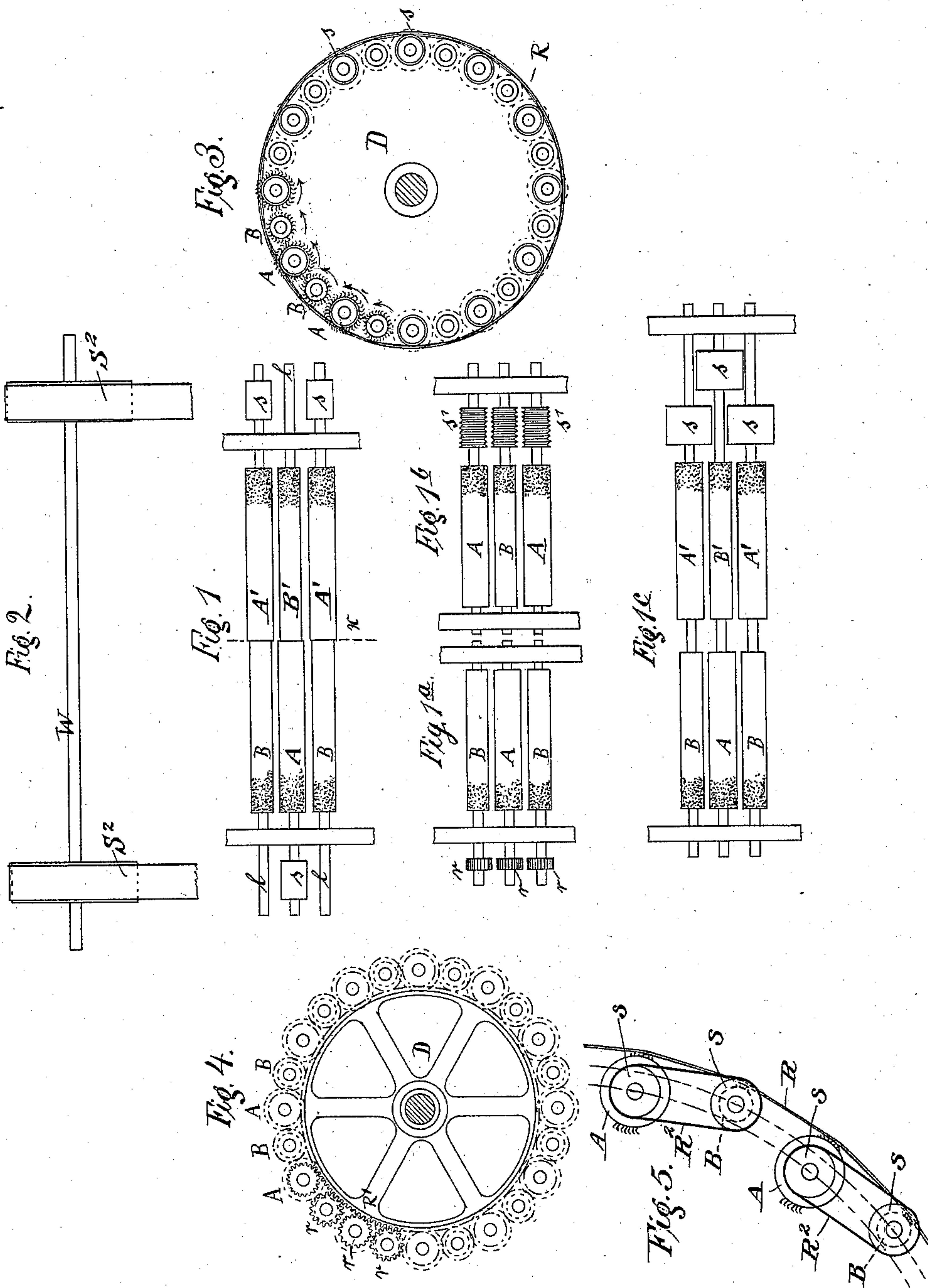


(No Model.)

E. GESSNER.
TEAZELING MACHINE.

No. 558,798.

Patented Apr. 21, 1896.



WITNESSES:

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ERNST GESSNER, OF AUE, GERMANY.

TEAZELING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 558,798, dated April 21, 1896.

Application filed September 23, 1891. Serial No. 406,621. (No model.) Patented in Belgium July 18, 1890, No. 91,313; in France November 29, 1890, No. 207,423; in England May 29, 1891, No. 9,096, and in Austria-Hungary July 25, 1891, No. 10,252.

To all whom it may concern:

Be it known that I, ERNST GESSNER, of Aue, Saxony, Germany, have invented a new and useful Improvement in Teazeling-Machines, (for which I have obtained Letters Patent in foreign countries as follows: in Belgium, No. 91,313, dated July 18, 1890; in France, No. 207,423, dated November 29, 1890; in Great Britain, No. 9,096, dated May 29, 1891, and in Austria-Hungary, No. 10,252, dated July 25, 1891,) of which the following is a specification.

This invention relates to that kind of raising-machines in which teazeling-rollers are employed, which are mounted upon the heads of a drum and revolve independently of the movement of the drum.

My invention comprises teazeling-rollers of different diameters on one drum, which are united one with another to run at the same axial speed, so that by revolving such united rollers one set of them is caused to assume a circumferential speed which differs from that of the other set by reason of their different diameters, thus obtaining two different series of rollers on one drum, with the teeth of the smaller rollers pointing in the opposite direction to the teeth of the larger rollers. These teazeling-rollers are successively arranged about the center of the drum, so that a roller of smaller diameter alternates with a roller of greater diameter, the said rollers being supplied with equal pulleys or pinions and united one with another through a belt surrounding said pulleys or through a wheel in gear with said pinions, so as to give them all the same axial speed, while their circumferences travel at different speeds by reason of their different diameters aforesaid.

The invention also consists in connecting two rollers of different diameters in alinement on a single axial shaft so that such rollers appear to be divided transversely into two parts, the diameter of the teazeling-rollers on one half at one end being different from that on the other half at the other end, such rollers being arranged alternately, with the large end of one next to the small end of the next, and being especially used for raising two pieces of cloth, one piece passing about one

half of the rollers at one end and the other piece about the other half at the other end.

Figure 1 shows a side view of the teazeling-rollers of different diameters alternately arranged in circuit around the drum and with a small roller at one end fixed to and arranged in alinement with a large roller at the other end. Figs. 1^a, 1^b, and 1^c show similar views of modified forms. Fig. 2 shows means for driving the teazeling-rollers. Figs. 3 and 4 show end views of teazeling-rollers of different diameter arranged around a drum, with means for connecting the same for equal axial movement, Fig. 3 showing a belt and pulleys for this purpose, and Fig. 4 a gear-wheel and pinion. Fig. 5 shows a modification.

Fig. 1 shows two series of rollers on each side of the middle line x , journaled at both ends of the drum. One large roller A on one side of the middle line x is fixed on the same shaft with a small roller B' on the other side of the line x , and so also with the rollers B and A'. The said rollers are also arranged about the center of the drum so that one roller of small diameter alternates on the same side of the middle line x with a roller of large diameter.

Fig. 1^c shows a slight modification, one of the rollers A being fixed with one of the rollers B' on the same shaft, but instead of joining on the line x , as shown in Fig. 1, there is some free space left between the rollers for the shaft to be journaled in the middle as well as at both ends. This modification is designed for machines of great width, to hold the teazeling-rollers in the middle, so as to prevent the same from wobbling from the flexibility which their great length would give.

I will now explain how the teazeling effect is produced. When the rollers on opposite sides of line x are rigidly connected through their axles, they need not be connected through belts or gearing, as in Figs. 3 and 4, because the effect of two pieces of cloth, one on one side of the line x and the other on the other, will give a mean axial speed that produces the same effect as if the rollers were

connected by a belt or gearing extending circularly around the drum. Thus if but a single piece of cloth were passed around the rollers on one side of the line x it is obvious
 5 that the large rollers and alternating small rollers would rotate by peripheral contact with the cloth and would all have the same circumferential speed; but when two pieces of cloth are used, one on each side of the line
 10 x , then the cloth on one large roller A gives it a definite speed, and by reason of its superior leverage controls the speed of the small roller B' at the other end, whose axial speed is the same but whose circumferential speed
 15 is less than that of the large roller by reason of its reduced diameter. Hence when two pieces of cloth are passed over the rollers, one on one side of line x and the other on the other, the reciprocal action of the cloth and rollers
 20 causes the large rollers to be rotated with and by the cloth, while the small rollers, whose teeth point in the opposite direction, are held back to a slower circumferential speed and scratch the cloth. The teasing-rollers, when
 25 constructed and arranged in this way, are revolved by the contact of the cloth alone, and when so driven by the teasing-cloth (operated by drawing-rolls) the rollers of one series serve as a brake or drag for the rollers
 30 of the other series. When the two pieces of cloth are drawn over the rollers and the drum is revolved, the rollers of both series receive a tendency to assume a circumferential speed which is equal to their "individual rolling
 35 speeds" under the cloth, or the speed at which they would roll about their respective axes if not interfered with; but the rollers A A' in rolling upon the surface of the cloth and having a greater diameter cause the rollers B B'
 40 to assume a circumferential speed which is slower. Hence the rollers B B' (whose teeth point in the opposite direction to A A') are caused to scratch the cloth, and in this way each set of rollers modifies the action and
 45 speed of the other set in a reciprocal way, and neither set revolves at its normal or individual rolling speed or speed at which it would roll under the cloth if not interfered with.

50 The greater difference in diameter there is between the large rollers A A' and small rollers B B' the greater is the effect of raising upon the cloth.

55 The same result described with reference to Fig. 1 may be obtained without having the differential rollers connected in axial alignment. It is only necessary that all the rollers, both A and B, should have the same axial speed but different circumferential speeds,
 60 and this may be attained by making the alternating rollers A and B of different diameters and connecting them around the drum with an equal gearing, either by pulleys of equal diameter and a belt R, as in Fig. 3, or
 65 by pinions r of equal size, Fig. 1^a, and a gear-wheel R', Fig. 4, meshing with and imparting the same axial velocity to each pinion.

For raising light goods it is preferred to revolve the teasing-rollers not only by the action of the cloth, but also by means of belts, 70
 cords, or gearings, and for that purpose their journals l are furnished with pulleys s s' or pinions r . For the purpose of driving the teasing-rollers by means of straps a shaft W is employed outside the drum, as shown in 75
 Fig. 2, which may be arranged above, below, or by the side of the drum, the said shaft having a pulley S² on each end, from which a strap passes about the pulleys s on the journals of the teasing-rollers. Instead of having pulleys 80
 attached to both ends of each roller only one pulley may be attached to each roller, the pulleys in this case being arranged alternately at opposite ends—that is to say, if the first roller is supplied with a pulley on the 85
 right-hand end the second roller would have its pulley on the left-hand end, and so on. By this means the strap coming from the shaft W on the right-hand end drives one half of the teasing-rollers and the strap of the left-hand end the other half of the rollers. By 90
 arranging the pulleys in this way there is more room left between the pulleys at each end, so that pulleys of greater diameter can be employed, which is an advantage. 95

The pulleys S² at both ends of the shaft W need not be of the same diameter, but may differ one from the other.

The shaft W may receive motion from the drum-shaft or from a counter-shaft, and its speed may be varied in the usual way by means of cones or cone-pulleys in order to regulate the speed of the teasing-rollers to obtain the proper tension of the cloth passing about the rollers. 100
 105

For machines of great width, to raise two or several pieces by the side of each other, the rollers of Figs. 3 and 4, although being of equal diameter from end to end, may be divided into two halves in the same manner as the rollers shown at Fig. 1^c, so that free space is left for the shaft to be journaled or held in the middle of the drum for the purpose of preventing the rollers from wobbling or being bent by centrifugal action. 110
 115

Instead of connecting all the rollers by one belt R they may be connected in pairs by pulleys of equal diameter, as shown at R² in Fig. 5, and be driven by the contact of band R with only one pulley of each pair. Instead 120
 of straps, cords might serve for connecting the teasing-rollers A B, which in this case are supplied with grooved pulleys s' , as shown in Fig. 1^b. 125

The pulleys s , as shown in Fig. 1, are arranged at the outer ends of the journals, so as to be placed outside the drumheads. Instead of being placed outside they may be placed inside the drumheads, as shown in Figs. 1^b and 1^c, or pulleys may be secured to 130
 the shafts of the rollers outside as well as inside the heads of the same drum, so as to be alternately arranged inside and outside the heads at one end or at both ends of the drum.

The rollers A B of Figs. 3 and 4 are rotated either by the action of the cloth or by the movement of the belt R or wheel R', which latter is loose on the drum-shaft, so as to be independent of the movement of the drum.

5 The teasing-rollers of both series, as shown in Figs. 3 and 4, are arranged in one circle—that is to say, all the teasing-rollers of both smaller and greater diameter are jour-
10 naled at the same distance from the center of the drum. In certain cases it is preferred to have the two series of teasing-rollers of different diameters arranged, as in Fig. 5, in two different circles for facility in cleaning
15 the rollers.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

20 1. In a teasing-machine, the combination of two series of rollers arranged about a drum and provided with teeth as shown and described, the rollers of one series being of larger diameters than those of the other series and having teeth pointing in a given di-
25 rection, and the rollers of the other series being arranged alternately with or between the rollers of larger diameter, and having teeth pointing in the opposite direction to those of the larger rollers, means for rotating both se-
30 ries of rollers in the same direction and with the same axial speed, to cause one series of rollers to act as a brake or drag for the other series, to produce a teasing effect on the cloth as described.

35 2. In a teasing-machine, the combination of two series of rollers arranged about a drum

and provided with teeth as shown and de-
scribed, and with equal pulleys or gears on
their axes, and a connecting belt or gear for
imparting an equal axial motion to all the
40 rollers, the rollers of one series being of larger diameter than those of the other series, and having their teeth pointing in a given direc-
45 tion and the rollers of the other series being arranged alternately with or between the roll-
ers of larger diameter and having teeth point-
ing in the opposite direction to those of the
larger rollers, means for rotating both series
of rollers in the same direction with the same
axial speed, to cause one series of rollers to
50 act as a brake or drag for the other series and
teazel the cloth in opposite directions sub-
stantially as and for the purpose described.

3. In a teasing-machine, the combination
of a double series of rollers arranged in a cir-
55 cle about a drum, said rollers being made of two halves, one half at one end of relatively large diameter, and the other half at the other
end of relatively small diameters, both halves
being rigidly connected in axial alinement,
60 and arranged with the large ends of one series of rollers alternating in the circle of the drum with the small ends of the intermediate
series, the small ends of the rollers having
teeth pointing in the opposite direction to
65 those of the larger ends substantially as and
for the purpose described.

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Witnesses:

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EMIL FALKE.