

No. 709,980.

Patented Sept. 30, 1902.

H. GILLJAM.
CARDING MACHINE.

(Application filed Feb. 4, 1901.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.

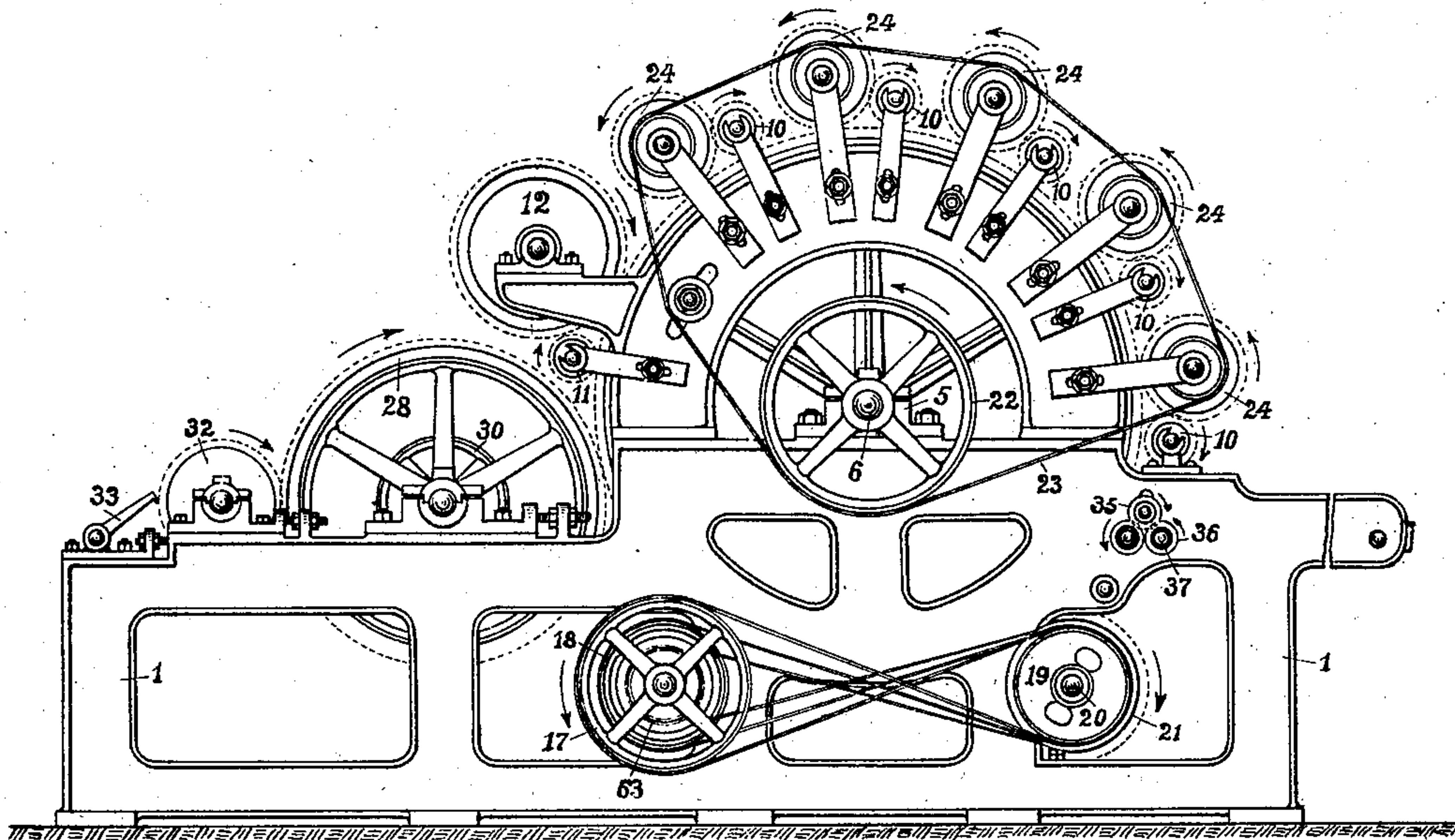
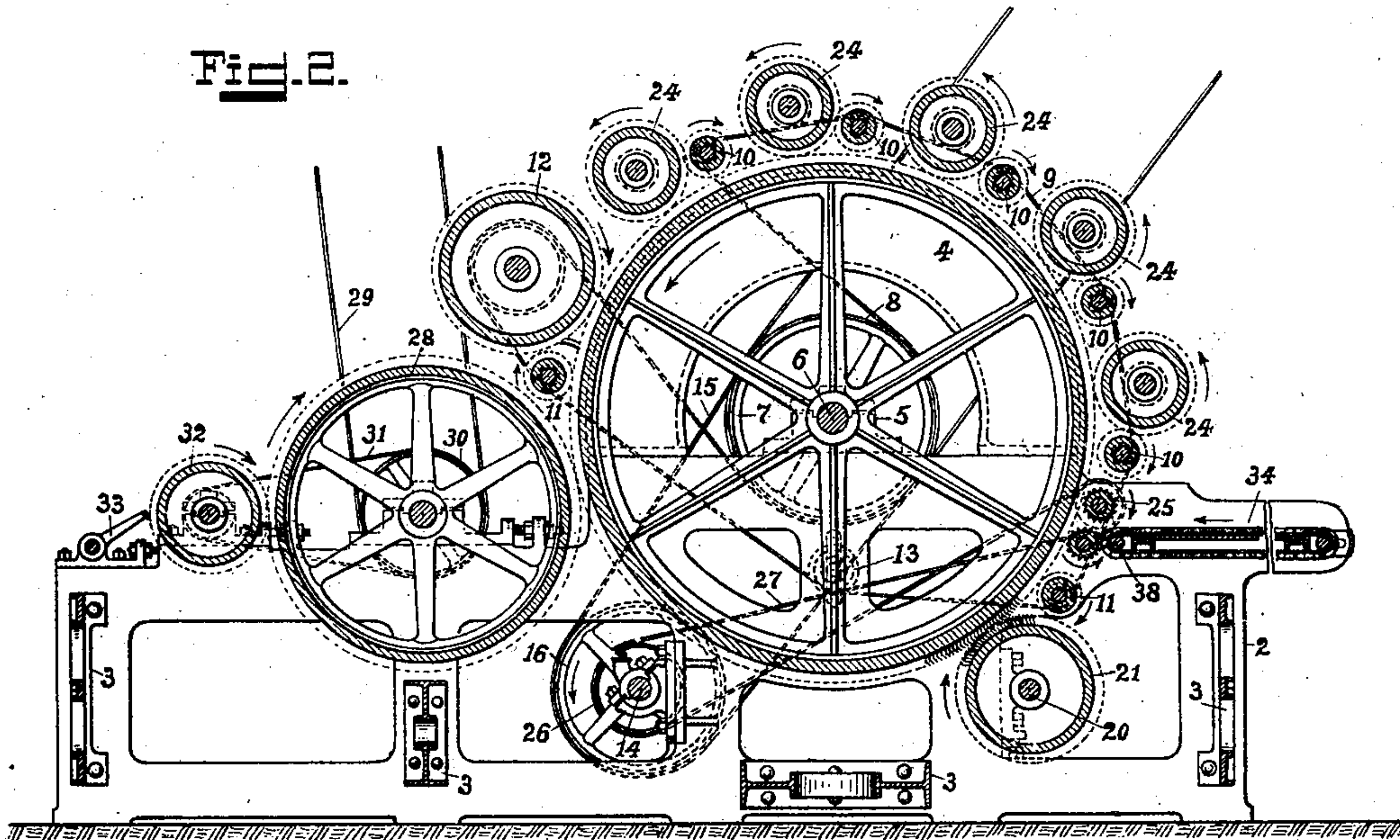


Fig. 2.



Witnesses:

J. G. Harder.

Jean Weissel.

Inventor:

Hubert Gilljam
per Martin Schmetz
Attorney.

No. 709,980.

Patented Sept. 30, 1902.

H. GILLJAM.
CARDING MACHINE.

(Application filed Feb. 4, 1901.)

(No Model.)

2 Sheets—Sheet 2.

Fig. 3.

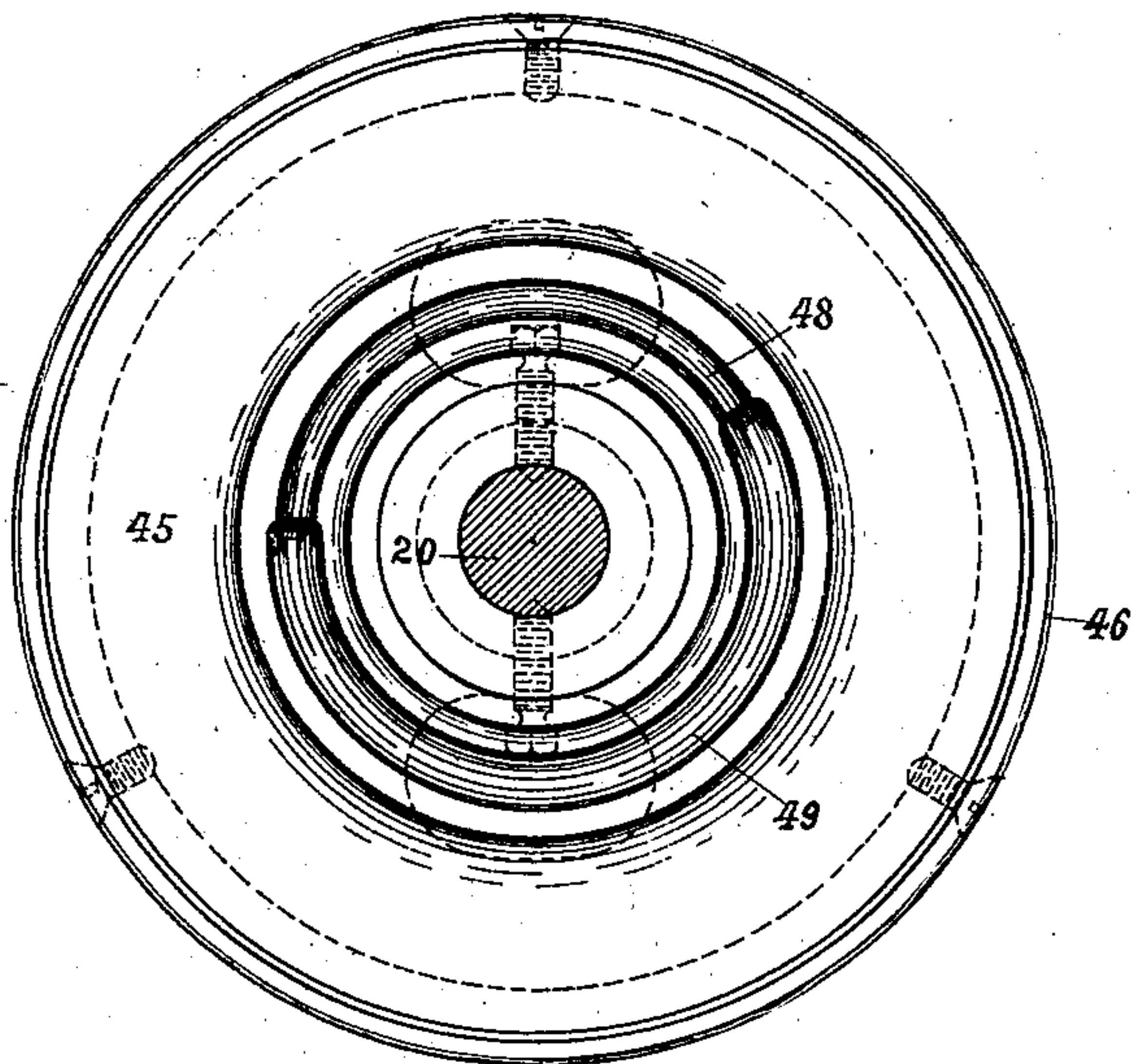
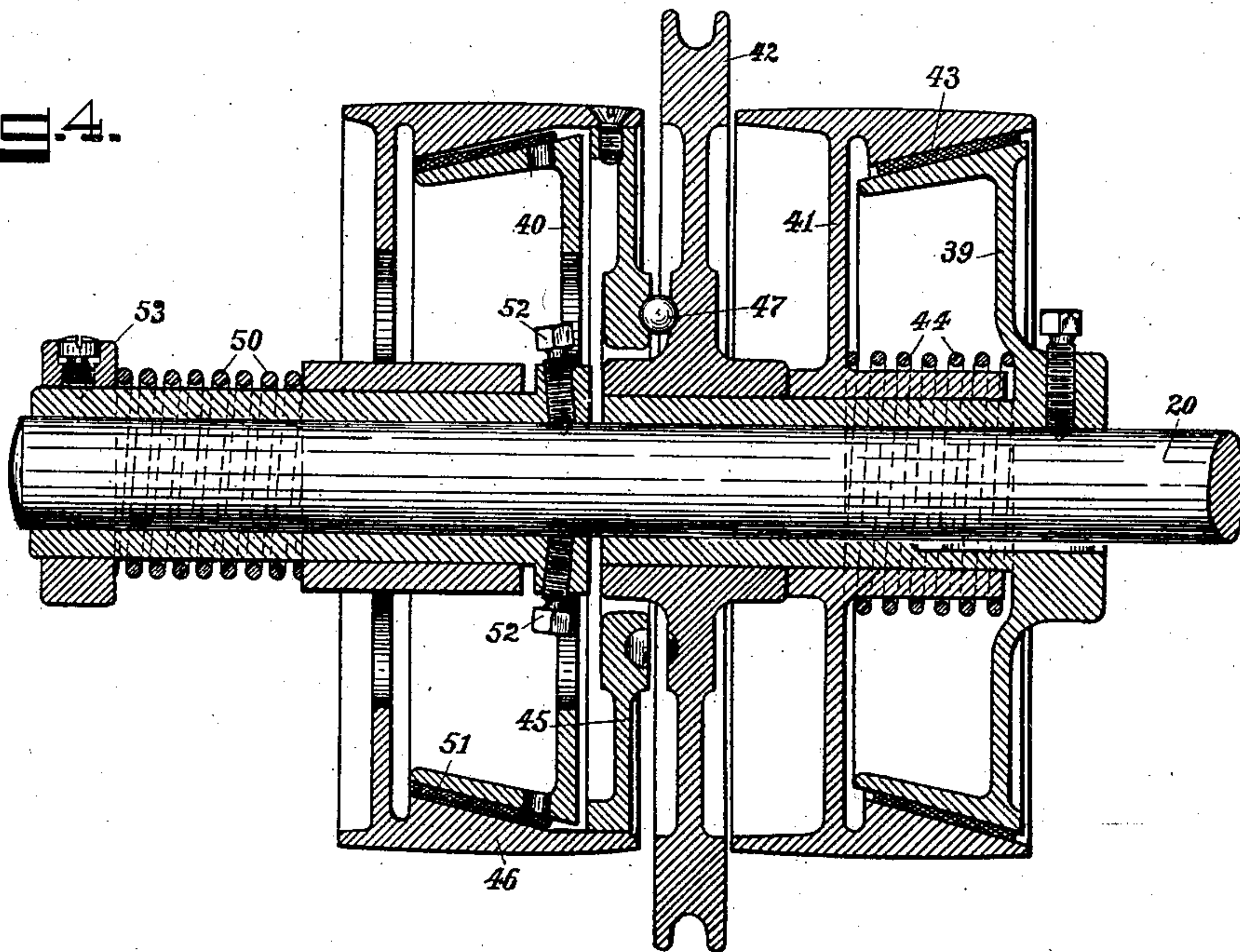


Fig. 4.



Witnesses:
F. G. Harder.
Jean Truesel.

Inventor:
Hubert Gilljam
per Martin Schmetz
Attorney.

UNITED STATES PATENT OFFICE.

HUBERT GILLJAM, OF LAURENSBURG, GERMANY.

CARDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 709,980, dated September 30, 1902.

Application filed February 4, 1901. Serial No. 46,017. (No model.)

To all whom it may concern:

Be it known that I, HUBERT GILLJAM, spin-
nery proprietor, a subject of the King of Prus-
sia, residing at Laurensburg, near Aix-la-
5 Chapelle, Kingdom of Prussia, in the Empire
of Germany, have invented certain new and
useful Improvements in Carding-Machines;
and I do hereby declare the following to be a
full, clear, and exact description of the in-
10 vention, such as will enable others skilled in
the art to which it appertains to make and
use the same.

My present invention relates to carding-
machines, and principally to a device therein
15 for thoroughly cleaning automatically the
carding-cylinder and keeping it clean during
work, so that the frequent intervals of rest
at present necessary for cleaning the clogged
teeth of the carding-cylinder and rollers are
20 avoided, and thereby the capacity of the card-
ing-machine enhanced.

In the accompanying drawings, Figure 1 is
a side elevation of a carding-machine pro-
vided with my invention. Fig. 2 is a longi-
25 tudinal section of the machine. Fig. 3 is a
plan view of the grooved flange and other
parts of a differential friction-clutch. Fig. 4
is a longitudinal section of said clutch.

The frame of the machine comprises the
30 two side parts 1 and 2 and the cross-pieces 3,
firmly bolted to said side parts. The carding-
cylinder 4 rests in journal-boxes 5 on the ele-
vated portions of side parts 1 and 2 and ro-
tates in the direction indicated by an arrow.
35 The shaft 6 of this carding-cylinder projects
beyond both of its journal-boxes 5. The end
of shaft 6 projecting over the side part 2 of the
machine-frame is provided with the two pul-
leys 7 and 8, of which pulley 7 is the driving-
40 pulley, and as it has a very broad face it
serves likewise to carry the driving-belt 9 for
the stripping-rollers 10, dust-rollers 11, and
volant 12. In order to carry this belt 9 over
the driving-pulleys of the above-mentioned
45 rollers, so as not to touch the under side of
pulley 7, an adjustable idler 13 has been ar-
ranged on the outside of the machine-frame
to serve this end in view and as a means to
regulate the tension of belt 9. The direction
50 of rotation of these rollers, pulleys, and belt
is indicated by arrows. Next to the pulley
7 is seated pulley 8, transmitting motion from

the shaft 6 to the shaft 14 by means of the
belt 15, running upon the pulley 16 on shaft
14. On the opposite end of shaft 14 are seat- 55
ed the two pulleys 17 and 18 and the rope-
pulley 63. The pulley 17 is larger than pul-
ley 18, and both are connected by belt with
the differential friction-clutch 19, seated upon
shaft 20 of the cleaning-roller 21. 60

The end of shaft 6 projecting beyond the
side part 1 of the machine-frame is provided
with a pulley 22, and over it runs a belt 23,
driving the working rollers 24 in the direc-
tion indicated by their arrows. This belt 23 65
runs likewise over an adjustable idler to pro-
vide means to regulate its tension.

The feed-rollers 25 receive their motion
from pulley 26 on shaft 14 by means of the
belt 27, which drives the upper of said feed- 70
rollers, while the lower feed-roller receives its
motion from the upper feed-roller by means
of toothed wheels. The doffer 28 receives its
motion from an independent belt 29. The
shaft of the doffer rests in adjustable bear- 75
ings and is provided with a pulley 30, upon
which the open belt 31 runs, imparting mo-
tion to the stripper 32, likewise journaled in
adjustable bearings. At the end of the ma-
chine-frame is adjustably arranged the doff- 80
ing or detaching knife 33, which takes the
material off the stripper 32.

In operation the material to be carded is
thrown upon the endless table 34, driven by
the lower of the feed-rollers 25, by means of 85
the wheel 35, meshing with the wheel of the
lower feed-roller and with the wheel 36 upon
the shaft 37 of the driving-roller 38 of said
endless table. As soon as the material has
reached the feed-rollers it is carried by them 90
to the circumference of the carding-cylinder
4 and undergoes the process of carding. The
material to be carded is partly removed by
the first working roller 24, running in oppo-
site direction to the cylinder 4, and in turn 95
taken off the working roller by the stripping-
roller 10, running in the same direction as
said carding-cylinder, but with greater cir-
cumferential speed than the working roller
24. Besides running faster than the working 100
roller 24 the teeth of the stripping-roller 10
enter the teeth of roller 24 to a certain depth,
so that the teeth of the latter are always kept
clean. The circumferential speeds of the

working roller 24 and of the cylinder 4 are equal. By running faster than the working roller 24 the roller 10 will take the material off the roller 24 and deposit it again upon the face of the cylinder 4. This play repeats itself until after many manipulations the carded fleece reaches the volant 12, which lifts the fleece out of the teeth of the carding-cylinder, but lets it rest upon them. A further advance of the cylinder 4 brings the fleece to the doffer 28, by which it is taken off said cylinder and carried to the stripper 32, whose teeth enter the teeth of the doffer 28, so that the whole of the fleece is taken off the doffer and carried to the doffing or detaching knife 33, from whence the fleece is carried to a point where it undergoes further manipulations.

Although the teeth of the doffer may be ever so nicely adjusted to the circumference of the carding-cylinder, a portion of the fleece will remain in the teeth of the latter, and it is clear if this remnant of the fleece is not removed each revolution of the carding-cylinder will add to the matter clogging its teeth, and in more or less time a thorough cleaning of the teeth of this cylinder will become a necessity. To avoid such cleaning and the therewith-connected loss of time and money, I have constructed a simple and yet efficient device to accomplish this cleaning task while the machine is at work. To this end I have designed the differential friction-clutch. (Shown in Figs. 3 and 4.)

Upon the end of shaft 20 are seated the fixed cone 39 and the adjustable cone 40, each provided with a friction-band of leather or of soft metal. The hub of the cone 39 carries the belt-pulley 41 and the rope-pulley 42. Pulley 41 is provided with a conical face 43, suitable to engage the friction-band of cone 39. The spring 44 tends to separate the pulley 41 and cone 39 and likewise shifts the rope-pulley 42 on the hub of cone 39. The face of the rope-pulley 42 next to the ring 45, inserted in the pulley 46, is provided with an annular groove or race in which runs a ball 47. Said ring is provided with a corresponding groove, comprising a shallow portion 48 and a deeper portion 49. The pulley 46 is slidably seated upon the hub of the cone 40 and stands under the influence of the spring 50, tending to press the conical seat 51 of pulley 46 upon the friction-band of the cone 40. The set-screws 52 serve to adjust the cone 40 upon the shaft 20, and the holes in the webs of pulley 46 and cone 40 serve to gain admittance to said set-screws; but the holes in the web of pulley 46 may be omitted, as the collar 53, spring 50, and pulley 46 can be removed, if necessary.

All parts having attained the positions shown in Fig. 4, the pulley 41 drives the shaft 20. In this position the ball 47 is held in the shallow portion 48 of the ring 45 and in the groove of the rope-pulley 42, wherein the ball will remain until it has reached the begin-

ning of the deeper portion 49. As soon as this takes place the stronger spring 50 presses the pulley 46 upon the friction-band of the cone 40, whereas now the spring 44 will drive the pulley 41 off its seat and move the rope-pulley toward the pulley 46. At the moment this change takes place the shaft 20 will be driven with a greater velocity than during the time it was driven by pulley 41, owing to the greater diameter of the pulley 17, driving pulley 46, as compared to the smaller diameter of the pulley 18, driving the pulley 41. During this interval of time the pulley 46 is driving the shaft 20 and its roller 21, the latter running at its highest speed, and as its circumferential velocity is greater at this speed than the circumferential velocity of the carding-cylinder and as the teeth of the roller 21 enter into the teeth of the carding-cylinder 4 the teeth of the former will remove all the remaining particles of the fleece left in the teeth of the carding-cylinder 4. This condition lasts until the ball reaches the shallow portion 48, bringing about a state of things as illustrated in Fig. 4 and described above, when the circumferential velocity of the roller 21 will be slower than that of the carding-cylinder and the teeth of the latter in a position to take the particles of the fleece out of the teeth of the cleaning-roller 21 and carry them upward to take part again in the cycle of carding operations.

The depths of the portions 48 and 49 are so chosen that when one pulley drives the other must of necessity leave its seat. The arrangement of the parts shown in Fig. 4 clearly shows that in this case the stronger spring 50 cannot press the pulley 46 upon its seat, being prevented from doing so by the ball 47; but as soon as the ball enters the deeper portion 49 the pulley 46 will be pressed upon its seat, and the weaker spring, being not any longer opposed, disengages pulley 41 and cone 39. The rope-pulley 42 is driven independently by a rope-pulley 63 upon shaft 14, and by choosing suitable diameters for these rope-pulleys the periods of changing may be regulated to suit any individual case.

In order to regulate the intervals of change from the faster to the lower speed of shaft 20, or vice versa, the length of the shallow and deeper portion of the groove in the ring 45 may be proportioned at will. The object in dividing said groove into different lengths is to have the cleaning period last longer than the time during which the withdrawn material is redeposited upon the carding-cylinder 4 in order to take part again in the cycle of manipulations above described.

The dust-rollers 11 serve to return any particles of the material escaping from the volant 12 and from the cleaning-roller 21 to the carding-cylinder.

As the well-known parts of the carding-machine—such as stripping-rollers, working rollers, doffer, &c.—and the manner of their adjustment form no part of my invention, they

have only been mentioned to sufficiently explain the general working of the machine, but are clearly indicated in the drawings.

I claim—

5 A differential friction-clutch for imparting alternately different velocities to a cleaning-roller of a carding-machine comprising one fixed friction-cone upon the shaft of the cleaning-roller, a friction-band on the face of said
10 cone, a belt-pulley and a rope-pulley sliding and rotating upon the hub of said friction-cone, a concentric ball-race in the web of said rope-pulley, a conical rim on the inner side of said belt-pulley suitable to engage
15 with the friction-band of said cone, a spring between the webs of said pulley and said friction-cone tending to separate them, an adjustable friction-cone, a friction-band on the face of said adjustable cone, a pulley sliding and
20 rotating on the hub of said adjustable cone,

a ring fixed in the rim of said pulley having a concentric groove comprising a shallow and a deeper portion, a friction-ball running alternately in said shallow portion or in the deeper portion of said groove in connection
25 with the ball-race of the rope-pulley, a set-collar on the adjustable cone, a spring between the set-collar and the hub of the belt-pulley provided with the ring containing the groove with the shallow and deeper portions, said
30 spring tending to press the conical rim of said belt-pulley upon the friction-band of the adjustable cone.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses. 35

HUBERT GILLJAM.

Witnesses:

C. E. BRUNDAGE,
C. GILLJAM.