

2 Sheets—Sheet 1.

# MACHINE FOR CRIMPING ANIMAL AND VEGETABLE FIBERS.

Patented Oct. 8, 1895.



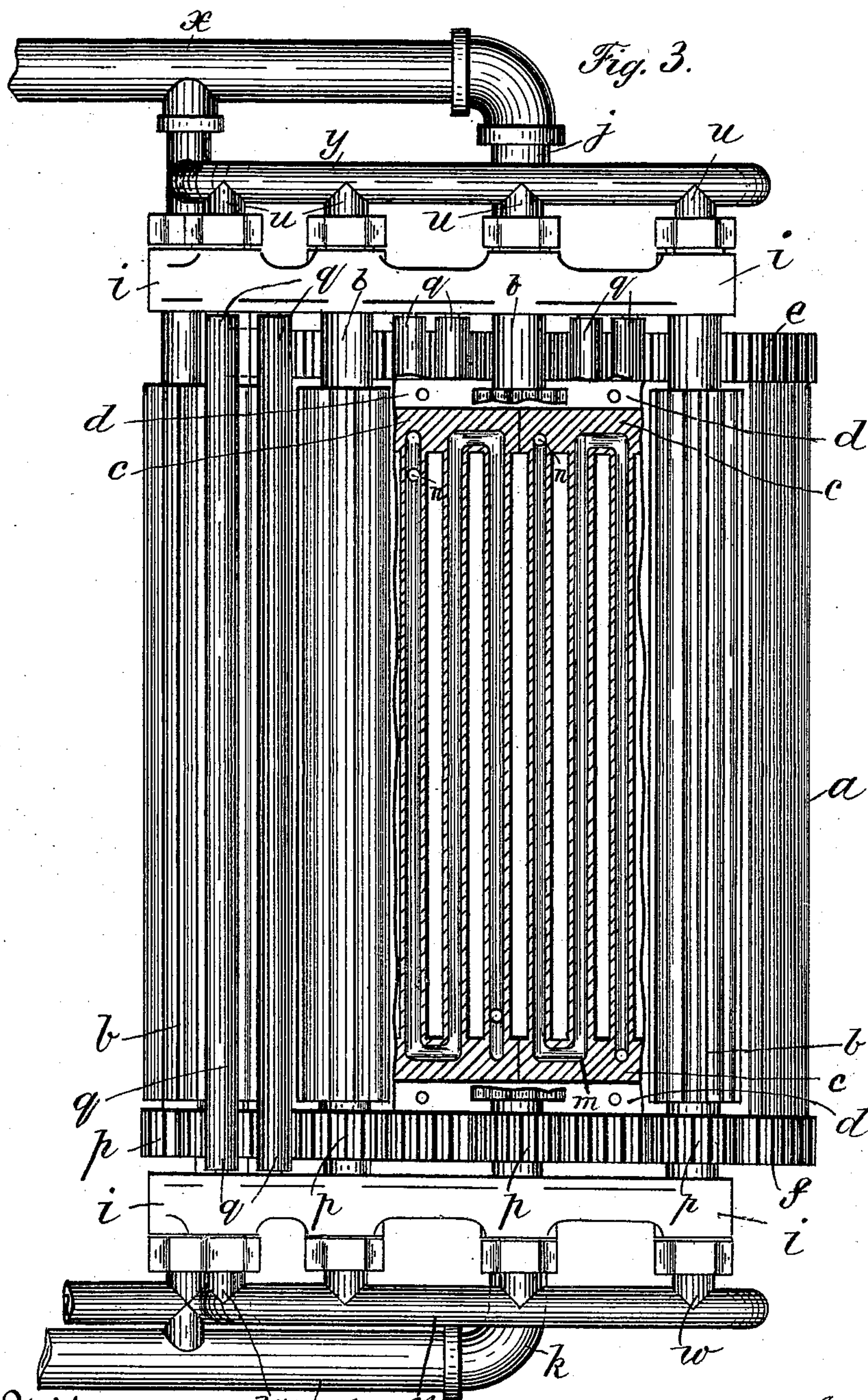
Inventor.  
Saml. A. Howard  
By  
H. P. Thayer/att'y

S. A. FLOWER.

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No. 547,636.

Patented Oct. 8, 1895.



Witnesses. *w y z*  
*Ch. Morgan*  
*S. H. Morgan*

Inventor.  
*Saml A Flower*  
*By A P Thayer*  
*att*



# UNITED STATES PATENT OFFICE.

SAMUEL A. FLOWER, OF NEWARK, NEW JERSEY.

## MACHINE FOR CRIMPING ANIMAL AND VEGETABLE FIBERS.

SPECIFICATION forming part of Letters Patent No. 547,636, dated October 8, 1895.

Application filed December 29, 1894. Serial No. 533,258. (No model.)

*To all whom it may concern:*

Be it known that I, SAMUEL A. FLOWER, a citizen of the United States, and a resident of Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Machines for Crimping Animal and Vegetable Fibers, of which the following is a specification.

My invention consists of improvements in machinery for crimping animal and vegetable fibers by means of steam or hot-air heated, fluted, or toothed rolls, as hereinafter described, reference being made to the accompanying drawings, in which—

Figure 1 is an end elevation of my improved crimping-machine with some parts detached and some broken out. Fig. 2 is partly a longitudinal section and partly a side elevation. Fig. 3 is a plan view with some parts in horizontal section.

I provide a large horizontally-rotatable toothed or fluted drum *a* with a series of smaller toothed or fluted rolls *b*, located at intervals apart over the upper portion of the drum, with their teeth meshing with the teeth of the drum, suitable for passing the fibers between the drum and the several rolls successively for crimping the fibers between them, and repeating the crimping operation as many times as there are rolls to effect more permanent and durable crimps. The drum is composed of a series of segmental sections *c*, forming the rim, said segments being bolted at the ends on side flanges *d* of spur-wheels *e f*, forming the respective heads of the drum and carried on the rotating shaft *g*, mounted in journal-boxes *h*, supported in the upright frames *i*, on which the fluted rolls *b* are also suitably journaled. The shaft *g* is hollow and has a pipe connection *j* at one end for admitting steam or hot air, and a corresponding pipe connection *k* at the other end for discharging the spent steam or hot air with an intermediate partition *l* to prevent escape of the heating-vapor directly through the shaft.

The segments *c* are constructed with cored circulating-passages *m* for the heating-vapor, which are formed with return bends and traverse the segments lengthwise three or more unequal number of times and are connected at the ends, respectively, with the bore of the shaft *g* by the radial pipes *n*, so that the heat-

ing-vapor entering at one end of the shaft *g* is directed into the segments at one end and after circulating through them returns from the other end into the shaft again and is discharged at the opposite end of said shaft relatively to its receiving end. Besides the advantage of simplicity of parts and the cheapness in thus producing the long range of circulating passages in the casting of the segments the arrangement of securing a series of passages in the segments served by one supply and discharge pipe each affords the necessary circumferential distance between the pipes to enable them to be connected into the comparatively-small shaft, which would not be feasible if each lengthwise passage in the segments were to be provided with its own supply and exhaust connections, because the small circumference of the shaft would not afford the requisite space. A large drum would have to be provided for such connection, and being large it would be of heavy and expensive construction to sustain the pressure required for a high degree of heat, whereas in my plan only a plain light shaft is required. The unequal numbers of lengthwise passages in the segments enable the radial supply and discharge passages to be located at the respective ends of the segments.

Power is applied to the driver by the pinion *o*, geared with the spur-wheel *e*, forming one of the heads of the drum. The other head *f* of the drum gears with pinions *p* on the rolls to drive them. The fluted rolls are thus geared to enable the crimping-flutes of the rolls and the drum to mesh in a way affording space for the fiber each side of the teeth and avoiding the crushing and grinding effect on the fibers that would result if the rolls were driven by the drum, or vice versa. This is effected by the teeth of the pinions having slight angular advance of the teeth of the flutes.

One or more plain idle rolls *q* of small size may be placed between the fluted rolls to confine the partially-crimped fibers against escape from the flutes of the drum while passing from one roll to another.

The fibers are to be fed into the machine in a wide thin sliver by any approved means over a chute *s* and will be discharged therefrom by a doffing-brush *t* or any other ap-



proved means. The rolls *b* are also hollow and have pipe connections *u* at one end for receiving the heating-vapor and other connections *w* at the other end for the discharge  
5 of the same.

The heating-vapor is supplied through the main pipe *x*, directly connected with the drum through stuffing-box *j* and having a branch *y* supplying vapor to the rolls. The connections  
10 for the discharge of the vapor at the other end of the machine are the same, *y'* being the main pipe, and *z* the branch; but these devices may be arranged in various different ways, and I do not limit myself to any particular  
15 arrangement of them.

I claim—

1. In a fiber crimping machine the combination of a toothed or fluted rotating drum, a series of intermeshing toothed or fluted rolls,  
20 and one or more plain idle rolls intermediate of the fluted rolls for confining the fibers in the flutes of the drum and causing them to pass between the drum and the rolls successively substantially as described.

25 2. In a fiber crimping machine, the combination with a cast metal toothed or fluted rotating drum formed with a series of cored circulating passages for a heating fluid, each traversing the shell lengthwise three or more  
30 unequal numbers of turns, and a hollow shaft of said drum formed with inlet and outlet passages and branches respectively communi-

cating with each of the passages of the shell for the circulation of the heating fluid there-  
through, of a series of intermeshing toothed 35 or fluted and fluid heated rolls geared with the drum substantially as described.

3. In a fiber crimping machine, a fluted drum consisting of the toothed or fluted segments secured to the heads and forming the  
40 rim of the drum and carried on the drum shaft, in combination with intermeshing toothed or fluted rolls, said drum and rolls geared by a spur wheel on the shaft of the drum, and pinions on the shafts of the rolls,  
45 said rolls journaled in bearings supporting them at intervals apart around the upper part of the drum substantially as described.

4. In a fiber crimping machine, a fluted drum consisting of the toothed or fluted segments having vapor circulating passages and  
50 forming the rim of the drum, and secured to heads carried on the hollow shaft, said shaft having vapor circulating passages and passages connecting said shaft and segments for  
5 causing vapor circulation through the segments substantially as described.

Signed at New York city, in the county and State of New York, this 1st day of December,  
A. D. 1894.

SAMUEL A. FLOWER.

Witnesses:

W. J. MORGAN,  
S. H. MORGAN.