G. DURRANT.

CLOTH STRETCHING MACHINE.

APPLICATION FILED MAY 27, 1910.

971,123. Patented Sept. 27, 1910.

3 SHEETS—SHEET 1.

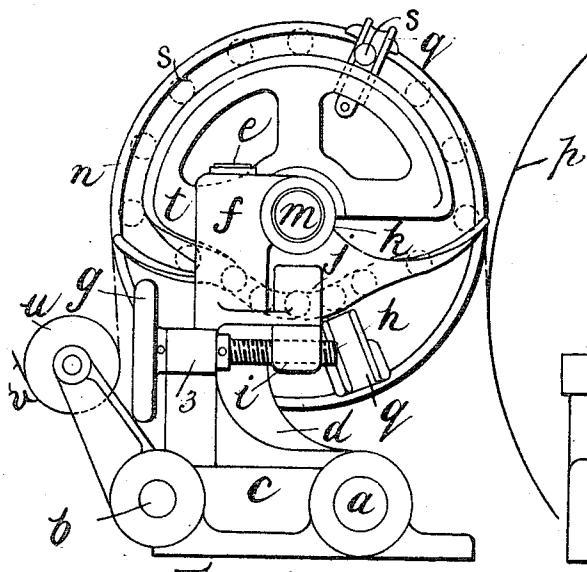


Fig. 1.

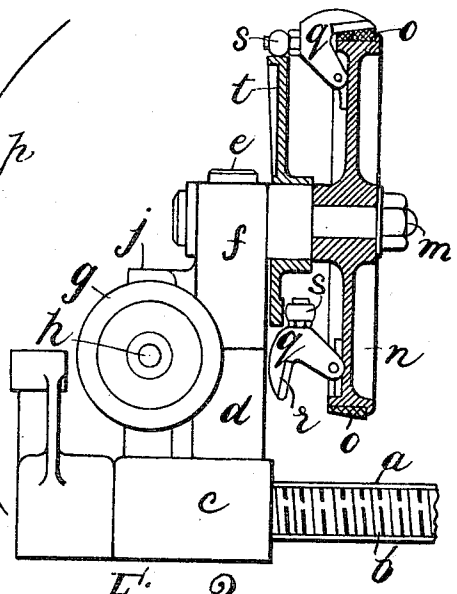


Fig. 2.

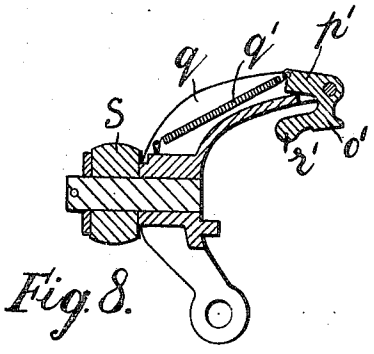


Fig. 8.

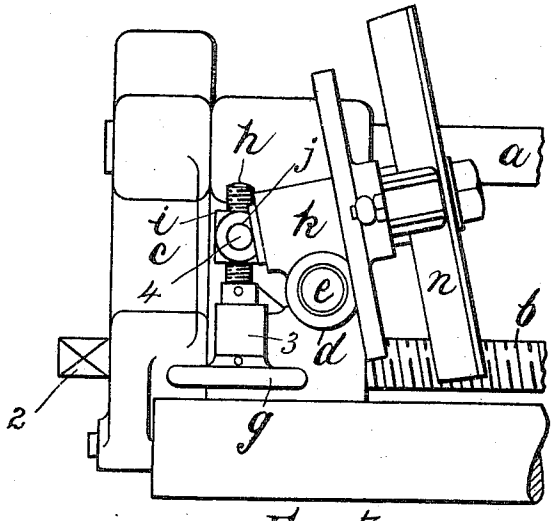


Fig. 3.

Witnesses.

Walter Allen

W. F. Allen.

Inventor.

George Durrant

by Herbert W. Jenner.

Attorney.

G. DURRANT.

CLOTH STRETCHING MACHINE.

APPLICATION FILED MAY 27, 1910.

971,123.

Patented Sept. 27, 1910.

3 SHEETS—SHEET 2.

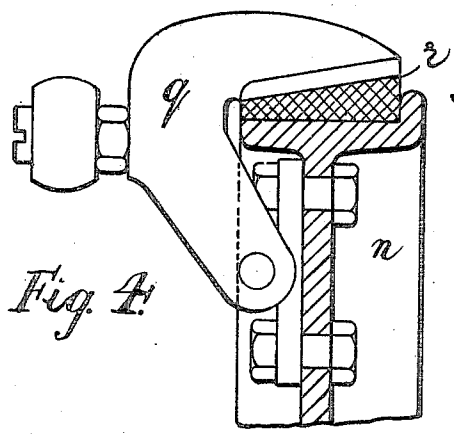
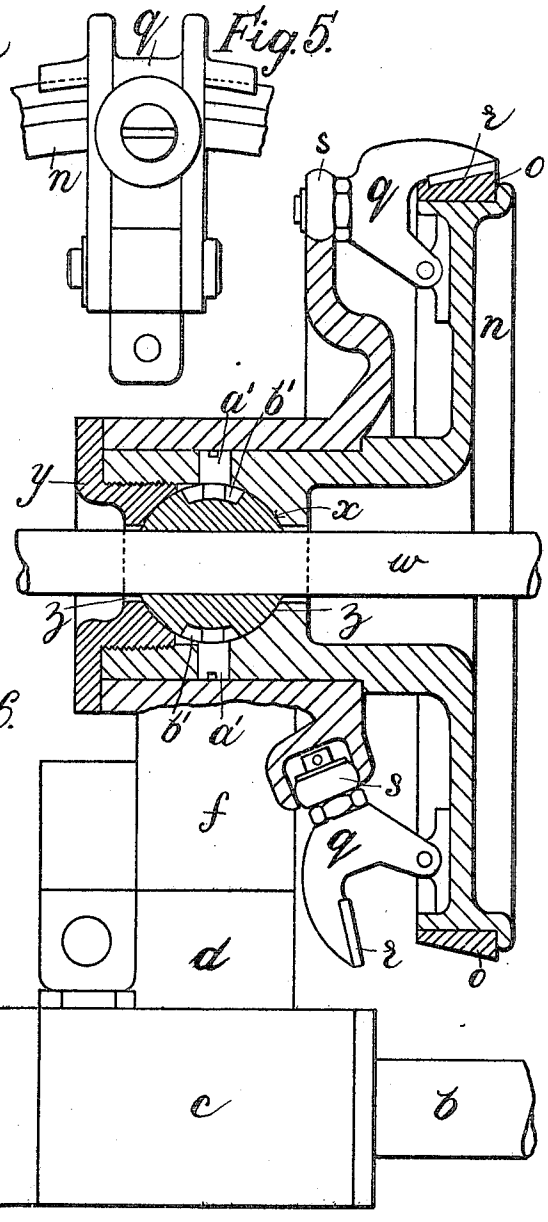


Fig. 4.



Witnesses

Walter Allen

W. E. Allen.

Inventor

George Durrant

by Hubert W. Jenner

Attorney.

G. DURRANT.

CLOTH STRETCHING MACHINE.

APPLICATION FILED MAY 27, 1910.

971,123.

Patented Sept. 27, 1910.

3 SHEETS—SHEET 3.

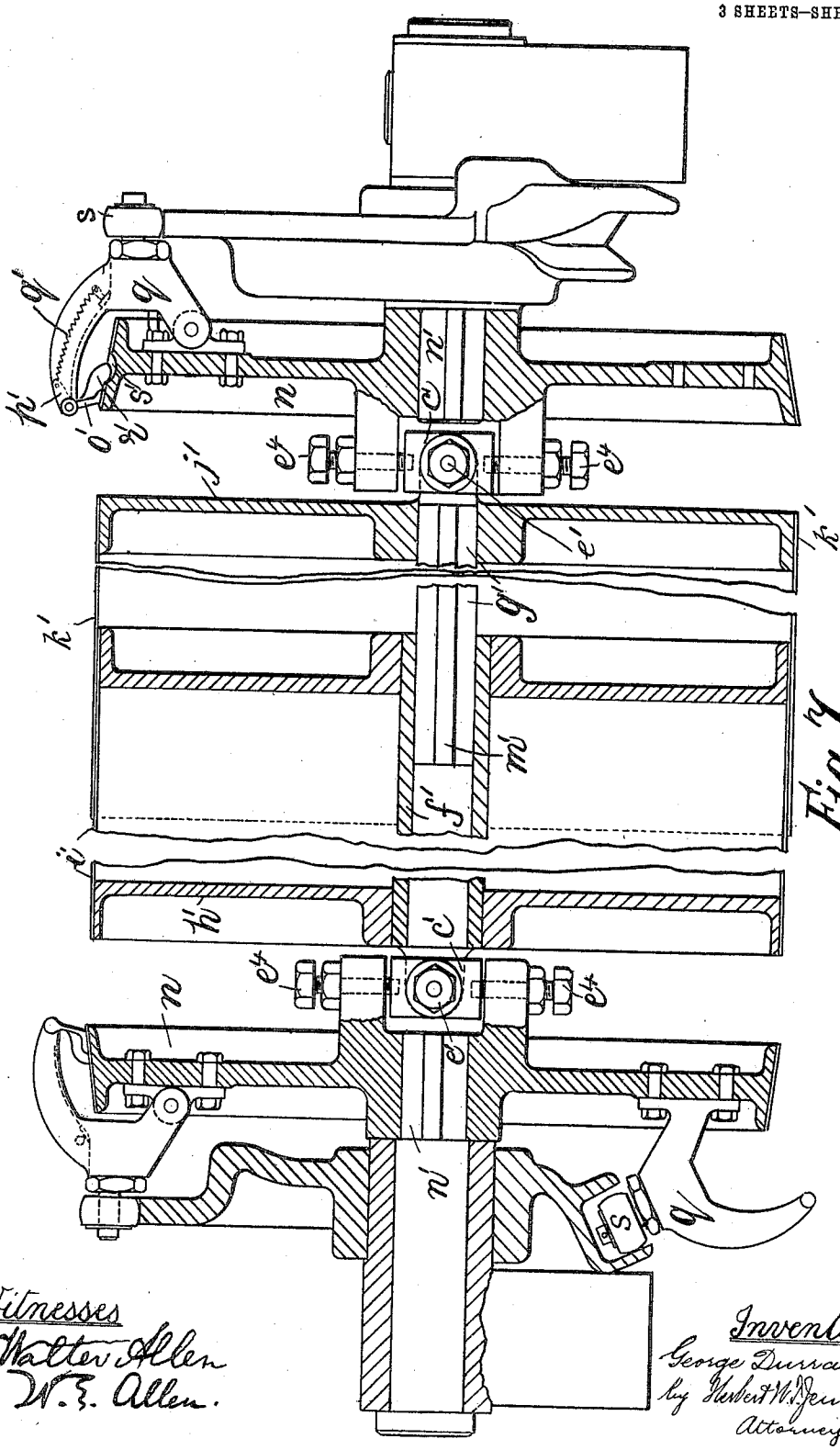


Fig. 4.

Witnesses
Walter Allen
W. E. Allen.

Inventor
George Durrant
by Herbert W. Jenner
Attorney.

UNITED STATES PATENT OFFICE.

GEORGE DURRANT, OF MANCHESTER, ENGLAND.

CLOTH-STRETCHING MACHINE.

971,123. Specification of Letters Patent. Patented Sept. 27, 1910.

Application filed May 27, 1910. Serial No. 563,743.

To all whom it may concern:

Be it known that I, GEORGE DURRANT, a subject of the King of Great Britain and Ireland, and resident of Higher Broughton, Manchester, in the county of Lancaster, England, engineer, have invented certain new and useful Improvements in Cloth-Stretching Machines, of which the following is a specification.

My invention relates to an improved apparatus or stretching device for enabling cotton, woolen and other fabrics to be stretched during manufacturing operations, devices of the kind being usually employed in stentering and other machines designed to stretch the cloth during its passage therethrough and has reference to that type of device consisting of diverging wheels or disks carrying clamping devices operated by cams for gripping the selvages of the cloth.

My invention consists essentially of a stretching device consisting of a pair of shafts one plain and one screw threaded at each end arranged to support two frames or brackets which can be moved nearer to or farther from each other by the screw-threaded shaft, adjustable brackets mounted on the frames adapted to be moved by screw or other mechanism and to be set as required, studs, pins or the like carried by adjustable brackets on which are mounted disks having a plane periphery in each case or a periphery covered with rubber, leather or other suitable material to form a more or less resilient bed acting as one jaw of a clamp, a number of lever devices pivoted to each disk acting as the other jaws adapted to be brought in contact with or removed from contact with the disks by cams and anti-friction rollers so as to grip and release the cloth to be stretched, such cam devices being formed in one with or fixed to the adjustable brackets previously referred to; means for determining the time at which the lever jaws shall grip the selvages of the cloth and means for supporting the cloth between the two disks.

A further feature consists in a modification of the aforesaid device in which the disks are mounted on spherical bearings to enable them to be adjusted to the angle required.

My invention will be fully described with reference to the accompanying drawings in which,

Figure 1 is an end elevation of a stretching device constructed in accordance with my invention. Fig. 2 is a front elevation of same, partly in section, Fig. 3 a plan of same, Figs. 4 and 5 a sectional front elevation and an end elevation to an enlarged scale of one of the clamping devices, Fig. 6 a sectional elevation to an enlarged scale showing a modification in the means of mounting one of the disks hereinafter referred to.

Figs. 1 to 6 of the drawings hereinbefore referred to only show the apparatus as arranged at one side of a stentering or other machine, the mechanism at the opposite side being an exact duplicate of that indicated. In accordance with my invention I may make the improved stretching apparatus as a machine entirely separate from a stentering or other machine in which cloth is to be stretched or it may be convenient to form it as a part of such. In either case the apparatus consists of two shafts one of which *a* is plain while the other *b* is provided with screw threads at each end one of right hand pitch and the other of left hand pitch. These shafts serve as guides for supporting a main base frame *c* and for enabling the two frames composing the complete apparatus to be moved nearer to or farther from each other in accordance with the width of the cloth to be stretched.

For the purpose of adjusting the supporting frames *c*, the screwthreaded shaft *b* is provided with a rectangular end portion 2, as shown in Fig. 3, to which a wrench may be applied so as to revolve the shaft. The shaft *a* operates merely as a guide and a support for the frames *c*.

Each supporting frame *c* is provided with a bearing for the shaft *a* to slide in, and it has also a screwthreaded bearing for the shaft *b* to engage with. Each frame *c* has also a vertical boss *d* which supports a vertical pin *e*, and a bracket *f* is pivoted on the pin *e*. A revoluble screw *h* provided with a hand-wheel *g* is journaled in a bearing 3 on the frame *c*, and this screw *h* engages with a nut *i* which is pivoted to a lug *j* on the bracket *f* by means of a pin 4 as shown in Fig. 3.

The bracket *f* has a horizontal bearing *k*

which carries a pin m, and a disk n is revolubly supported by the pin m. The disk may either rotate freely on the pin or stud m or may be fixed to it and the latter rotate in the horizontal boss. The periphery of the disk may be parallel to the axis of the stud or be slightly inclined or be of conical formation as indicated in the drawing. It may also be perfectly plain or be covered with a sheath of indiarubber o, leather, vulcanite or other suitable material and may be flanged at its inner side to hold such material in place against the pull of the cloth during stretching. By means of the adjusting arrangements hereinbefore described the disks at each side of the apparatus may be set to any angle required in plan and to correspond with the amount it is desired the cloth shall be stretched in passing from the stretching apparatus to any following mechanism such, for instance, as the cylinder p.

Each of the disks n has pivoted to its outside face a number of gripping arms q which are substantially in the form of bell crank levers with a gripping face r conforming to the shape of the periphery of the disk n. These gripping arms are arranged equidistant from each other all around the disk n and carry at the junction of each of their two arms an anti-friction roller or bowl s arranged to come in contact with a cam t substantially of semi-circular formation and fixed in position on the adjustable bracket f, such cam being a combination of an edge and face cam.

u indicates a roller and the line v the cloth to be stretched passing under the aforesaid roller and through the stretching apparatus to the cylinder p.

In Fig. 6 the same letters apply to corresponding parts of the apparatus previously described. In this modification instead of mounting the disks n on separate short studs or shafts they are both mounted on a shaft w which near each end is provided with a spherical bearing x of a fixed character. The boss of the disk is internally shaped to correspond and to form a bearing around the sphere in conjunction with a threaded cap y screwed into the boss, sufficient clearance being allowed in the holes z to enable the disk to be set to the required angle by similar mechanism to that already described. The boss of the disk n is provided with driving pins or studs a^1 engaging with recesses b^1 formed in the spherical bearing x the arrangements at both sides of the machine thus enabling the two disks to rotate together, the shaft being driven by any suitable means. In other respects this modified arrangement is similar to that already described. I would also have it understood that instead of the disks n being driven by the friction of the cloth passing over them they may be positively driven by other means than those described in connection with the modification illustrated in Fig. 6.

In operation the device described acts as follows:—The cloth to be stretched may be passed over the roller u and on to the disks n at each side of the machine. As the latter rotate either by the friction of the cloth or by being positively driven each of the gripping arms or levers q is brought successively into operation by their bowls s coming into contact with the fixed cams t so as to grip the cloth between their faces r and the peripheries of the disks. As the cloth is drawn forward, over say, the cylinder p the gripping arms are successively released at a point as near the cylinder as possible and assume the position shown at the lower side of Fig. 2. This operation is repeated continuously the cloth being well gripped at the selvages and becoming stretched as it passes over with the disks from the point at which the latter are nearest to each other at the front of the stretching apparatus to a point at which they are widest apart nearest the cylinder on to which the cloth is delivered in the stretched condition.

I would have it understood that the details of construction may be varied without departing from the essential characteristics of my invention.

What I claim as my invention and desire to secure by Letters Patent is:—

1. In a cloth-stretching machine, the combination, with two similar supporting frames provided with vertical pins at their upper parts and having also laterally projecting bearings, of brackets mounted on the said pins, revoluble clamping disks carried by the said brackets, cams secured to the said brackets, bell-crank levers pivoted to the said disks and provided with jaws for clamping the material to the disks during a portion of each revolution of the disks, said levers having also projections for engaging with the said cams, nuts pivoted to the said brackets, and screws journaled in the said bearings and engaging with the said nuts and affording a means for adjusting the angular positions of the clamping disks without stopping the machine.

2. In a cloth-stretching machine, the combination, with two similar supporting frames provided with vertical pins at their upper parts and having also laterally projecting bearings, of brackets pivoted on the said vertical pins, horizontal pins projecting from the said brackets, revoluble clamping disks carried by the said horizontal pins, cams secured to the said brackets, bell-crank levers pivoted to the said disks and provided with jaws for clamping the material to the disks during a portion of each revolution of the disks, said levers having also

projections for engaging with the said cams, nuts pivoted to the said brackets, and screws journaled in the said bearings and engaging with the said nuts and affording a means for adjusting the angular positions of the clamping disks without stopping the machine.

In testimony whereof I have hereunto set my hand in the presence of two witnesses.

GEORGE DURRANT.

Witnesses:
AMY E. EVINS,
WILLIAM H. TAYLOR.