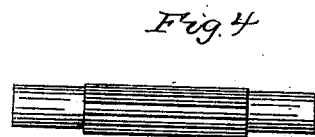
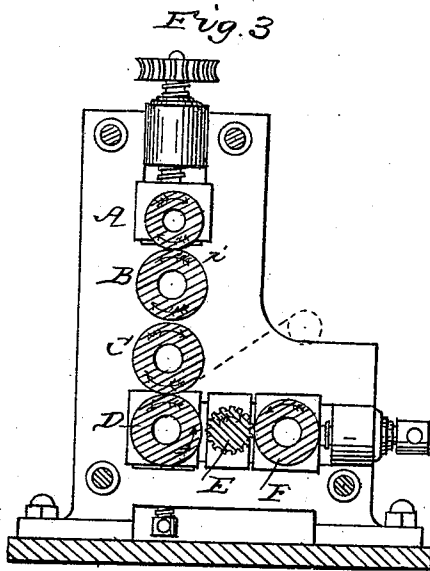
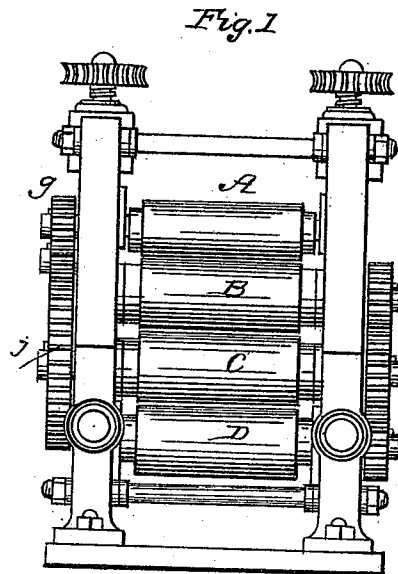
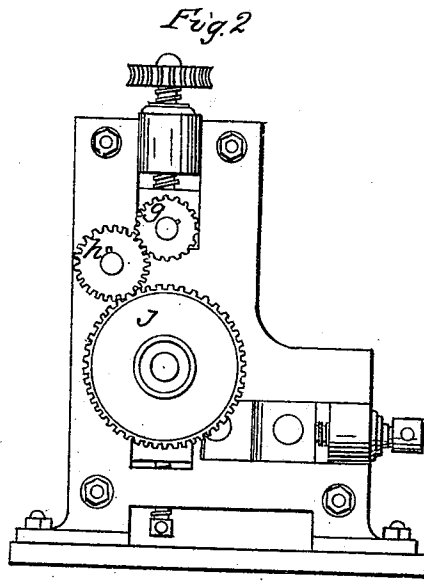


H. H. DAY.
Rubber Fabrics.

No. 25,249.

Patented Aug. 30, 1859.



WITNESSES
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HORACE H. DAY, OF NEW YORK, N. Y.

ELASTIC CLOTH.

Specification of Letters Patent No. 25,249, dated August 30, 1859.

To all whom it may concern:

Be it known that I, HORACE H. DAY, of the city, county, and State of New York, have invented a new and useful Description
5 of Elastic Cloth, and that the following is a full, clear, and exact description of my said invention and of the manner of making the same.

The object of my invention is to obtain
10 low priced elastic cloth possessing great elasticity, and it consists in a compound fabric composed of a sheet of looped cloth or stockinet goods, of a layer of elastic-gum, and of a coating of flock, the whole com-
15 bined together so that the sheet of stockinet forms one face of the fabric and the flock the other, the rubber being contained between the two.

My new elastic cloth may be manufactured in various ways, depending upon the condition of the gum, or the machinery employed, or upon both. I prefer to form it of unvulcanized india rubber and to effect the vulcanization after the parts of the
20 fabric are combined together. The gum for the purpose is prepared in the usual manner for vulcanizing by grinding it with the customary quantity of sulfur, and is then spread upon a sheet of stockinet goods,
25 after which flock is sifted upon the bare surface of the gum and the whole is passed between rollers by the pressure of which the combination of the parts of the fabric is effected.

I prefer to manufacture this new elastic cloth by means of a calender such as is represented in the annexed drawing. This calender has six rollers, four of these, A, B, C, D, are arranged horizontally one above
30 another, the remaining two, E, F, are located at one side of the lowermost roller of the set. The four rollers of the set are plain rollers, and are made hollow as is customary in calenders for spreading rubber
35 and gutta percha upon cloth, so that they may be heated by steam admitted within their barrels by means of suitable pipes. The middle roller E of the lower three is fluted. The last roller, F, of the series is
40 employed as a sustaining roller, its barrels bearing against that of the small fluted roller and preventing it from yielding to the pressure to which it is subjected. The rollers are geared together by pinions secured to their driving ends so that they
45 severally revolve in the direction indicated

by the arrows upon them in the annexed drawing. The dimensions of the pinions are such that the barrels of the rollers B, C, D, E, F, all revolve at the same speed, and
50 that the barrel of the topmost roller, A, revolves at a different speed from the others, this difference in speed being attained by the relative difference in size in the pinions *g*, *h*, *j*, which communicate motion to
55 this roller from one (C) of the others. The whole series are caused to revolve simultaneously by applying power to them by cog wheels and pinions in the manner usual in calender rollers for spreading rubber upon
60 cloth.

In manufacturing my new elastic cloth with this calender, a mass of the gum of the putty like consistency which it has when
65 taken from the grinding mill, is applied to the hot calender at the opening *i* between the uppermost pair of rollers, so that as they revolve they gradually draw it in between them and reduce it to a sheet. The sheet of
70 gum passes around the second roller B to the space between it and the third roller C, and by the operation of these two is reduced to the thickness required. It then passes around the third roller to the space between
75 it and the fourth roller D. As it passes between these two it is applied to the sheet of stockinet goods which should be prepared previously for the purpose by coating it with a thin sizing of india rubber composition, composed of india rubber dissolved
80 in camphene. The prepared cloth is fed between these two rollers from a roll of this cloth located at one side of the calender, so that the sheet of stockinet cloth issues
85 from between these rollers, C, D, covered with a thin uniform layer of the prepared gum. The gummed sheet of cloth is then conducted around the fourth roller and returned upward between it and the fluted
90 roller E; in its passage around the fourth roller the flock is applied to its bare surface, so that the stockinet cloth, the gum and the flock upon it are all subjected simultaneously to the pressure of the two rollers D E. As
95 the roller E is fluted, its ribs, acting upon the soft gum, form it into parallel strands, which, when the rollers are at a proper distance apart, are connected only by a thin film of gum sufficient to cement the flock on one side to the stockinet cloth on the
100 other. The compound cloth is then vulcanized by heating it in the usual manner. In
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case the gum is not sufficiently soft its face must be moistened by the application of a solvent, such for example as camphene, before the flock is applied; and as the construction of the calender I have described affords but a small space for the application of the flock and for that of the solvent, when a solvent is used, I prefer when sufficient space can be attained to conduct the gum coated stockinet cloth, after it leaves the lower two rollers, C, D, over a table before submitting it to the action of the finishing rollers. The solvent may then be readily applied and the flock sifted upon the gum during the passage of the gum coated stockinet cloth over the table. When the cloth is to be smooth instead of ribbed, the fluted roller is removed and is replaced by a plain cylindrical roller, or the fluted roller may be removed and the sustaining roller F may be moved so as to act in concert with the other plain roller, D.

I have thus far described the manufacture of my new elastic cloth as effected at one operation but it may be manufactured by first forming a sheet of vulcanized gum, or of recomposed gum, in the usual manner and then cementing upon it the flock and the stockinet goods by means of an elastic cement, the whole being consolidated by passage between calender rollers, or by pressure between plates; or the gum may be vulcanized upon the stockinet cloth and the flock may be cemented upon the bare surface

of the gum; these methods are however more expensive than the one that I have first described.

Having thus described my new elastic cloth and the mode of manufacturing it, it is proper to state that I am aware that stockinet cloth has been coated upon one side with elastic gum so that the compound fabric has a stockinet face upon one side and a gum face upon the other; this compound fabric is well suited to the manufacture of rubber shoes and similar articles which require a surface that will repel water, but its gum surface is an objection to its employment in the formation of those articles of clothing in which the elasticity of the fabric is the main requisite. My new elastic cloth is free from this defect as it presents on one side the velvety surface of the flock, and on the other the cloth surface of the stockinet.

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

The new elastic cloth herein described consisting of stockinet cloth elastic gum and flock combined substantially as herein set forth so that the elastic gum is covered on one side by the stockinet and on the other by the flock, the said elastic cloth being a new manufacture.

HORACE H. DAY.

Witnesses:

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