D. D. PARMELEE.

Manufacture of Rubber Fabrics.

No. 26,519. Patented Dec. 20. 1859.

Fig. 1

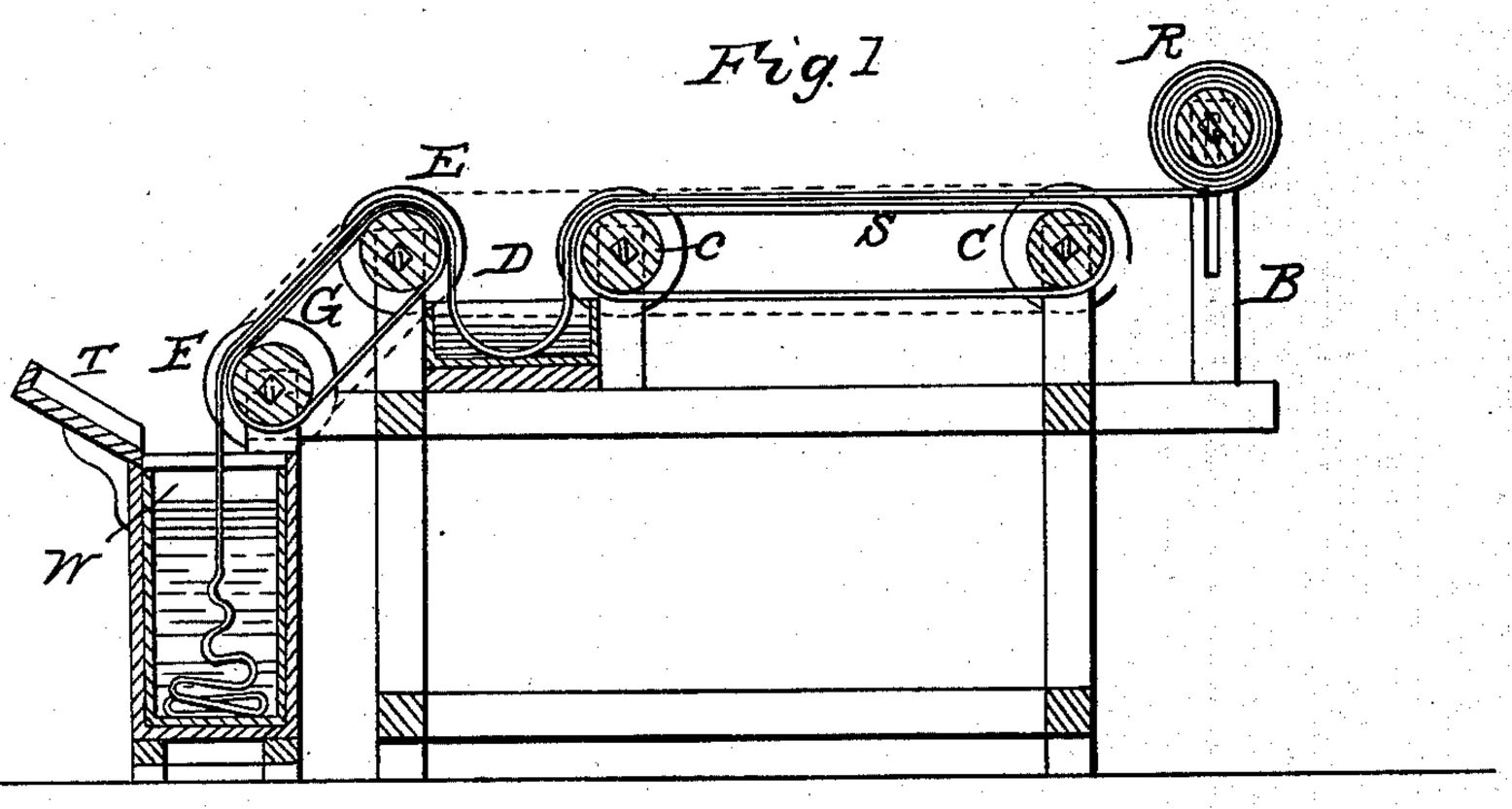
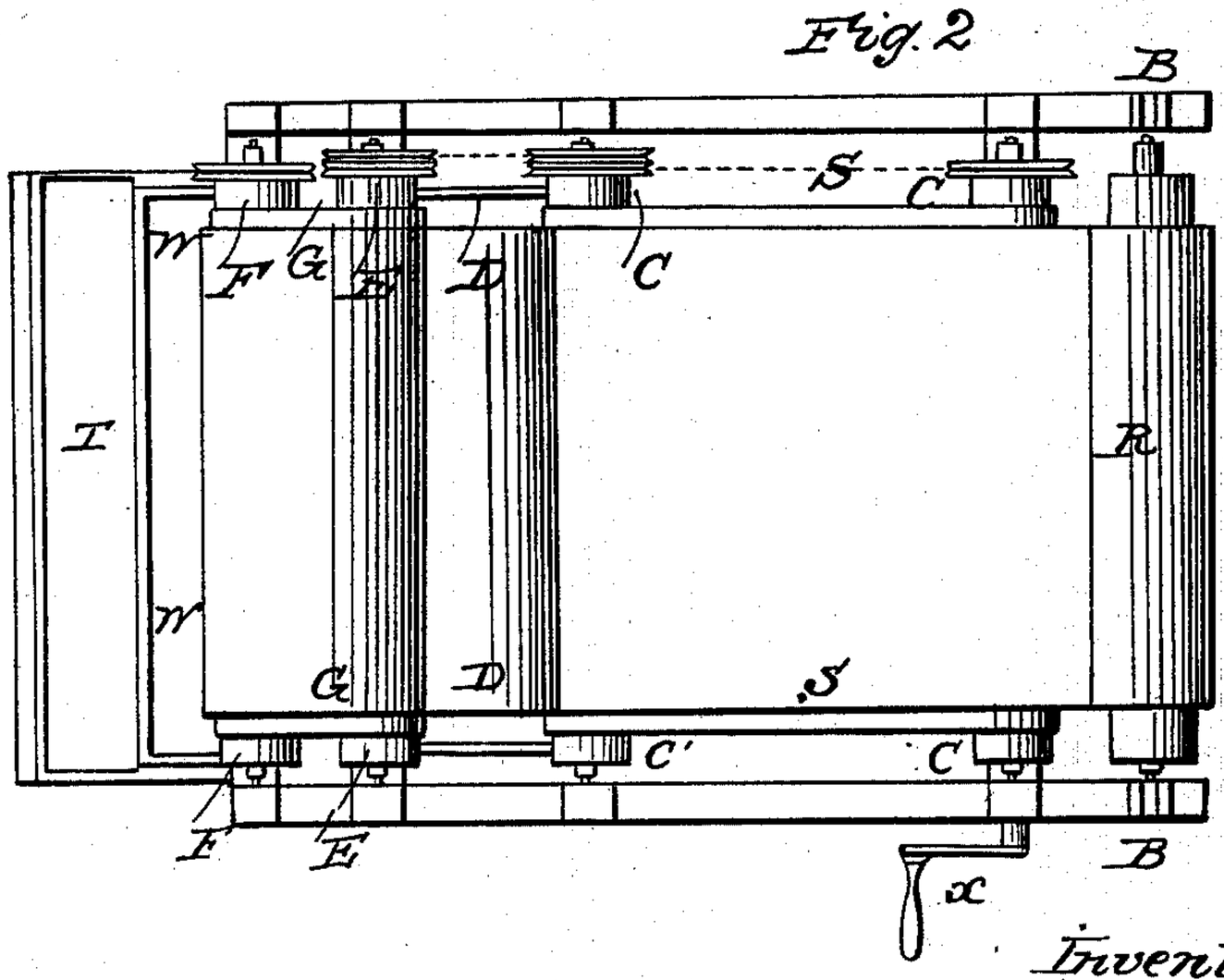


Fig. 2



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UNITED STATES PATENT OFFICE.

DU BOIS D. PARMELEE, OF SALEM, MASSACHUSETTS, ASSIGNOR TO JOHN A. GREENE, OF BEVERLY, MASSACHUSETTS.

MANUFACTURE OF RUBBER ARTICLES.

Specification of Letters Patent No. 26,519, dated December 20, 1859.

To all whom it may concern:

Be it known that I, DU BOIS D. PARMELEE, of Salem, in the county of Essex and State of Massachusetts, have invented a new and useful method of applying to india-rubber or its equivalent or their compounds its or their hermizing solution for effecting the change in the cold way; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawing, which forms part of this specification, and which represents, in vertical section and plan view, certain contrivances or mechanism suitable to the practical applicaton of my invention.

There are many difficulties connected with the treatment of india rubber sheets or sheets made up in part of india rubber, gutta percha, or their compounds, necessary to effect in the cold way the changes similar to those produced by their vulcanization, as commonly called, and which includes or consists in the immersion of the sheet or sheets in a solution containing chlorin or bromin. Such is necessarily an operation of great delicacy, partly on account of its rapidity of action, but particularly on account of those changes or series of changes which take place in the material being acted upon by the chemical ingredients of the bath from the moment of its immersion therein till the accomplishment of the final result. Thus, there is a gradual softening of the sheet by the hermizing solution, so that the sheet, in being handled, is not only apt to stick to but very liable to be torn by the fingers of the operator. This and other reasons have made it heretofore impracticable to operate by hand, on a large or manufacturing scale, in the production of cloth or sheets of the description referred to and the vulcanization of which is effected in the cold way as before mentioned.

Said reasons may be classified as follows: Firstly, there is the liability of the sheet to be torn or injured. Secondly, the sticking of the softened or pasty-like rubber to the fingers of the operator, and it sticks with such a force or tenacity as to render its removal, till worn away, an act of great difficulty or impossibility. Thirdly, the tendency of the solution or material impregnated with it, seriously to injure the fingers and hands of the operator, by the necessity, which there exists in the handling of the sheet for him to wet and keep wet with water his hands, and which water by its contact with the chlorin in the solution causes there to be formed hydrochloric acid, the effect of which on the system generally as well as on the fingers or hands needs no comment here other than that the soreness produced on the fingers makes it impracticable for the operator to continue at the work for any lengthened period without a pause and often enforces absence for weeks at the time. Fourthly, the difficulty or impossibility there is or has been to produce a uniform action of the hermizing solution throughout or over the sheet being acted upon. This difficulty exists, whether the sheet be large or small, though where large and inconvenient to handle it of course is greater. Equality of immersion or saturation by hand of a very large sheet is in fact utterly impossible. This difficulty will be readily understood, and the great expense attending it, made apparent, when it is explained that in previous attempts by hand to manufacture sheets as described, of ordinary size only, it has required no less than seven operatives to be engaged, exclusively in the treatment of the sheet to the hermizing process; that is, two men to unroll the rubber sheet or rubber coated cloth as it comes from the calender; two more to feed the sheet properly into the trough containing the hermizing solution; two to feed it out from the trough and one to keep the cloth, which is lighter than the solution, submerged, to secure the proper hermizing of the sheet.

To remove such difficulties in the hermizing of rubber coated cloth or sheets made up wholly or in part of rubber, gutta percha, or their equivalents; and by certainty of result and economy in production, to invest with a practical value the manufacture of the same; is the object of my invention, which consists in the use of mechanical means for feeding the sheet in and out of the hermizing solution in a steady and uniform manner substantially as hereinafter described and whereby handling of the saturated sheet is avoided.

In the mechanism represented in the accompanying drawing, R is a reel around which the sheet of rubber or rubber cloth is wound previously to its being hermized. The axle of the reel, which runs in brackets

B at either end, draws out and is made to fit other similar reels so as to save time by wrapping fresh cloth on another or other reels during the hermizing of the one roll or sheet, and to take the place of the reel in the brackets when its cloth or said roll is "worked off."

A reel with the rubber sheet or rubber coated cloth being in its place in the bracket B, the operator places the outer end of the sheet on an endless apron S, which is passed around drums or rollers *c c'* at either end, and said rollers tied together in addition, if required, by side belts or bands to make the rollers move in unison and to insure the one roller acting promptly and efficiently as the driver of the other, free from slip, and giving to the conveying apron S an independent character. The operator then turns the one roller *c*, by means of a crank *x*, and, at the same time, with his other hand, turns the reel R, to feed out and forward the required quantity of cloth, and so continues to advance the cloth along and with the motion of the apron S, timing the speed of the same by the motion of the crank *x*, and moving the reel R in accordance with the draft to prevent strain and to insure the proper and easy paying out of the cloth. This being continued, the cloth is projected or gradually fed into a tank D made of glass, lead stone or other suitable material situated at the rear end of the conveying apron, and containing the necessary hermizing solution. In the vicinity of this tank should stand another operator whose office it is to see that the rubber cloth falls or bends so as to dip in the solution and to attend to the further feeding of it over a roller E and down or over an endless delivery apron G wound around said roller and another roller F acting in conjunction therewith, till the rubber cloth saturated with the hermizing solution falls or is fed into a water cistern W to wash the cloth as necessary in the hermizing process. These last named rollers E and F or the driving one E of them should be of the same diameter as the rollers *c c'* of the main apron and should be belted or geared with said rollers so as to secure an equality of speed in the feed and delivery of the sheet to and from the hermizing tank. This speed will of course be changed to suit various circumstances, such as strength of the solution, thickness of the rubber cloth and so forth, and which should control the period of immersion of the sheet in the hermizing solution or rate of its traverse therethrough. When all the cloth from the one reel has been thus fed and hermized, the second operator rinses the cloth in the cistern and rolls it up on a table T and while the second operator is doing this, the first operator may be engaged in removing the spent reel and in replacing it by another full reel R to be operated on as before.

Thus, it will be seen two operators suffice instead of seven; time is economized; a positive uniformity for the hermizing action secured throughout the whole sheet; and all handling of the cloth, after or while it is saturated with the hermizing solution and previous to being washed, avoided; besides which many other advantages accrue, and a practical method of manufacturing said sheets in a regular and automatic manner by machinery, as distinguishable from a mere hand process, for the first time is attained.

Of course the mechanical contrivances may be varied to effect a like result in substantially the same manner, but the means I have described explain how my invention may be carried out.

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

The employment in the manufacture of india rubber sheets, whether combined or not with cloth and when the same are to be treated in the cold way to effect the "change" as described, on either side of the tank containing the hermizing solution, of a feeding mechanism so arranged and operated that the sheet may be fed in and out of the tank at a uniform rate and free from injurious handling and draft or strain substantially in the manner and for the purposes herein set forth.

In testimony whereof I have signed my name to this specification before two subscribing witnesses.

DU BOIS D. PARMELEE.

Witnesses:
A. BLEAK,
EDM. F. BROWN.