E. STRAUSS & W. B. ERSKINE.

MACHINE FOR MAKING COMPOSITE FABRIC.

APPLICATION FILED JULY 21, 1909.

945,635. Patented Jan. 4, 1910.

3 SHEETS—SHEET 1.

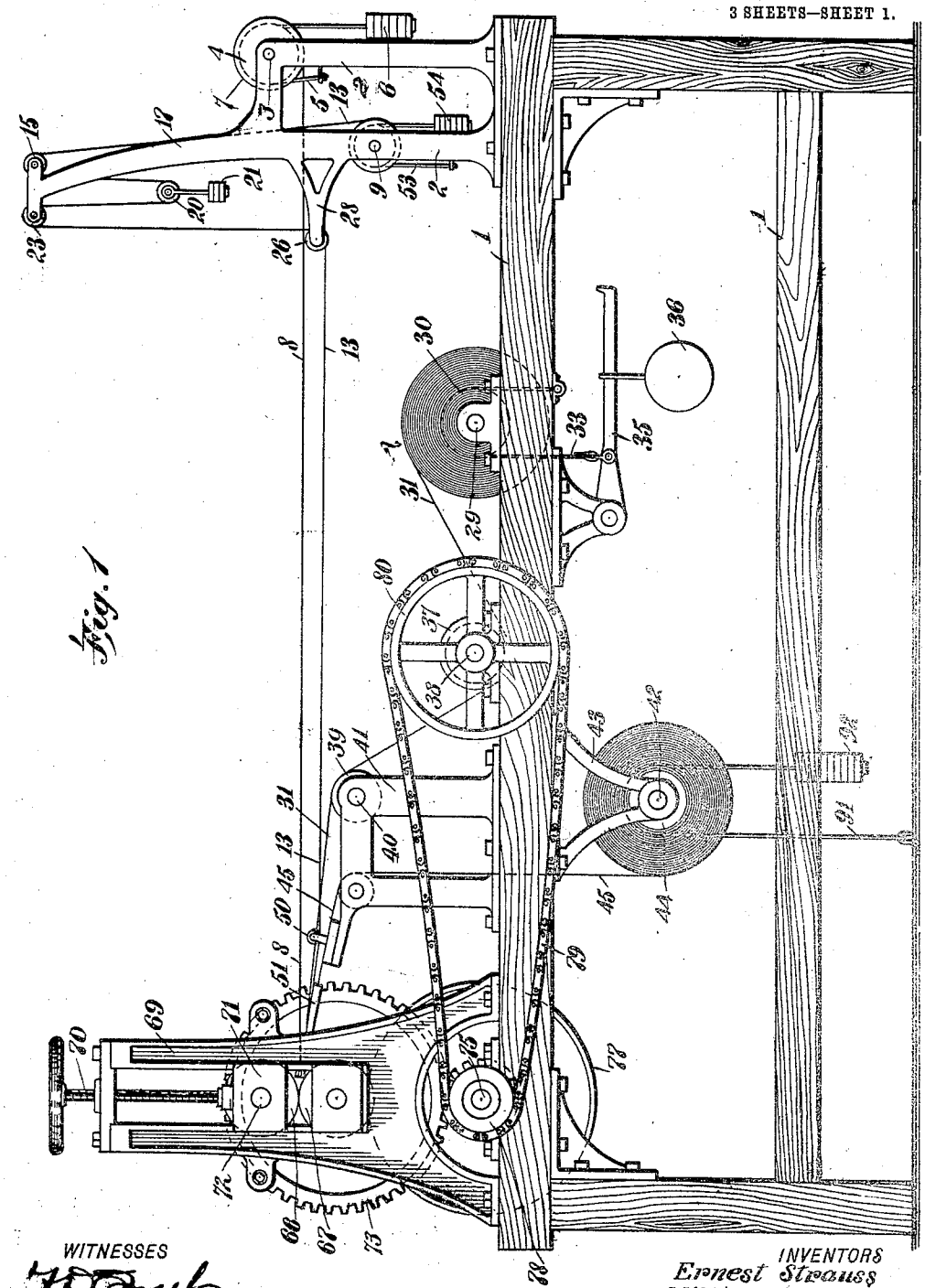

Fig. 1

WITNESSES

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3 SHEETS—SHEET 2.

Fig. 2

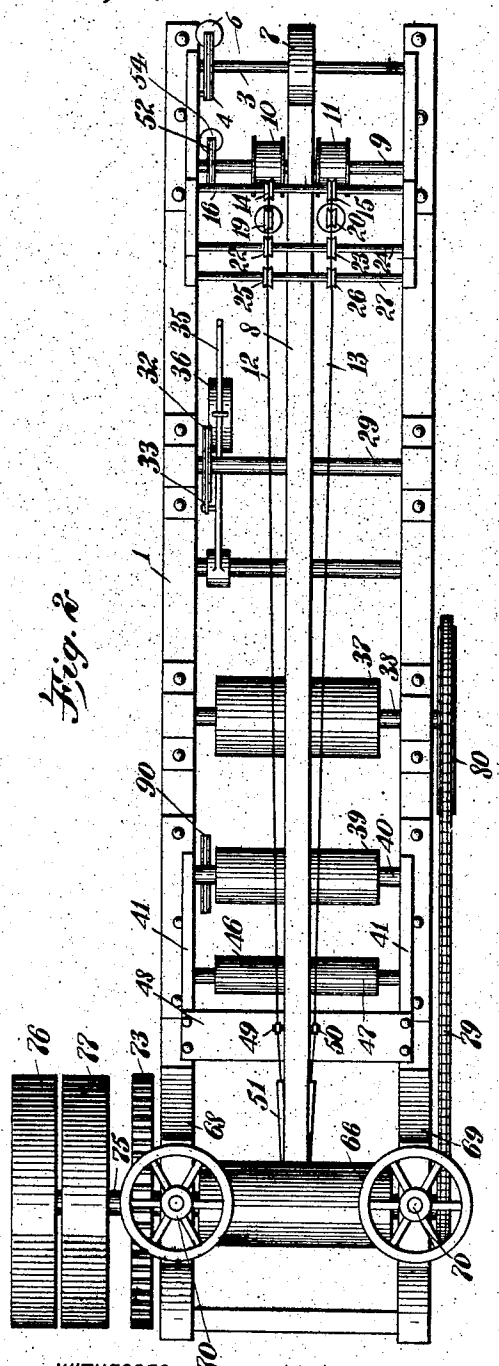


Fig. 5

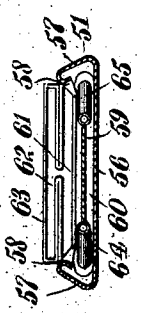


Fig. 6

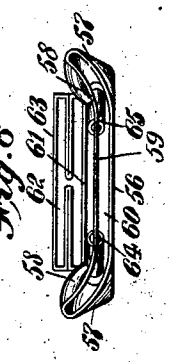
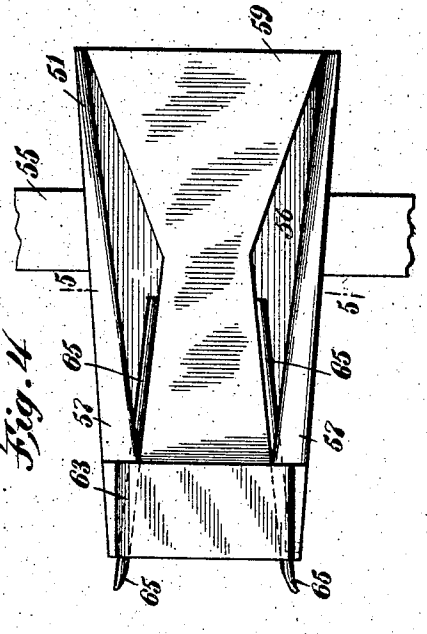


Fig. 4



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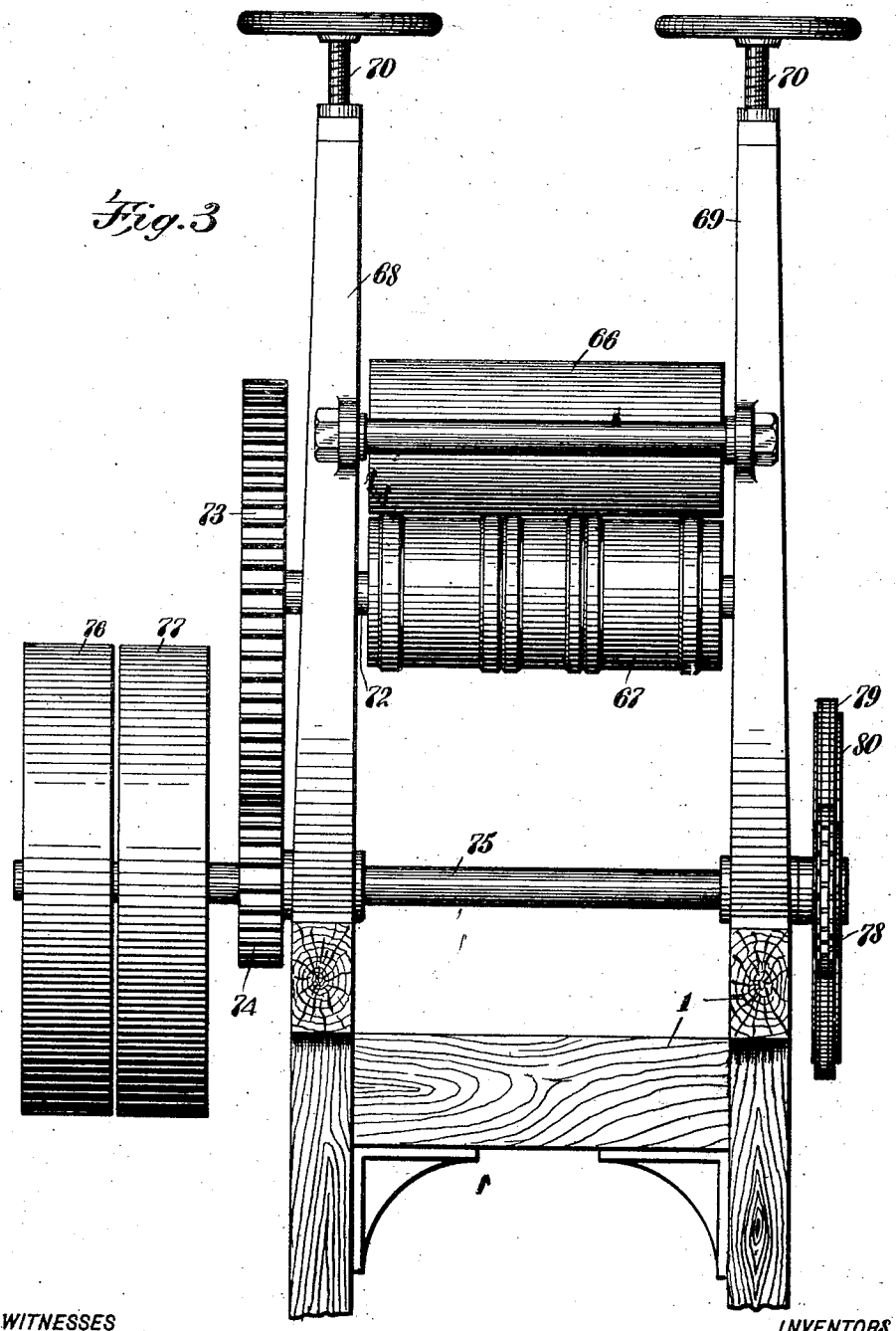
3 SHEETS—SHEET 3.

Fig. 3



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UNITED STATES PATENT OFFICE.

ERNEST STRAUSS AND WILLIAM B. ERSKINE, OF NEW YORK, N. Y.

MACHINE FOR MAKING COMPOSITE FABRIC.

945,635. Specification of Letters Patent. Patented Jan. 4, 1910.

Application filed July 21, 1909. Serial No. 508,834.

To all whom it may concern:

Be it known that we, ERNEST STRAUSS and WILLIAM B. ERSKINE, both citizens of the United States, and residents of the city of New York, borough of Manhattan, in the county and State of New York, have invented a new and Improved Machine for Making Composite Fabric, of which the following is a full, clear, and exact description.

This invention relates to a new and improved machine for making a composite fabric, which is more particularly described and claimed in our co-pending application Serial No. 508,833, filed July 21, 1909.

An object of this invention is to provide a device which will be simple in construction, accurate and positive in its operation, strong, durable and inexpensive to manufacture.

A further object of this invention is to provide means for delivering a plurality of layers of material under proper tension, to an assembling and folding device.

A still further object of this invention is to provide means for delivering a plurality of layers of material to a compressing device in a peculiarly assembled relation and under a proper tension.

These and further objects, together with the construction and combination of parts, will be more fully described hereinafter and particularly set forth in the claims.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views, and in which—

Figure 1 is a side view in elevation of our device; Fig. 2 is a top plan view of the same; Fig. 3 is a vertical end view; Fig. 4 is an enlarged top plan view of the assembling and folding device; Fig. 5 is a vertical transverse section on the line 5—5 in Fig. 4; and Fig. 6 is an end view of the folding device looking toward the left of Fig. 4.

Referring more particularly to the separate parts of the device, 1 indicates a supporting frame, composed of any suitable material and assembled in any suitable manner. At one end of the supporting frame 1, there is provided a suitable bracket 2 of any suitable form and material, which has rotatably secured thereto in any well known manner, a removable shaft 3. Secured on the shaft 3, there is provided a brake-wheel 4, over which is adapted to pass a suitable flexible brake-band 5, which is secured in any well known manner to the frame at one end, and has suspended from its other end a plurality of removable weights 6. By this brake-band and the removable weights 6, an adjustable slip-tension may be placed on the shaft 3.

Removably secured on the shaft 3 in such a manner as to rotate therewith, there is provided a reel or drum 7, on which one layer 8 of the composite fabric is wound, and from which the mechanism to be described, is fed with this particular fabric. The brake-band 5 keeps the fabric 8 under tension while it is being unwound from the reel 7.

Adjacent the shaft 3 and also removably journaled in the bracket 2, there is provided a similar shaft 9, on which are removably secured a pair of reels or drums 10 and 11, which supply elastic threads 12 and 13 of any suitable material, such as rubber or the like, to the assembling and forming mechanism, to be described. There is also provided on this shaft 9, a slip-tension brake-wheel 52, over which passes a flexible brake 53, which is secured at one end in any suitable manner to the bracket 2, and has connected to its opposite end, a plurality of removable weights 54. The elastic threads 12 and 13 pass from the drums 10 and 11 up over suitable guide pulleys 14 and 15, which are rotatably secured in any well known manner on a shaft 16, which is secured to an extension 17 on the bracket 2. From the pulleys 14 and 15, the elastic threads 12 and 13 pass around suitable floating pulleys 19 and 20, which are adapted to place an adjustable tension on the threads by means of removable weights 21. From the floating pulleys 19 and 20, the elastic threads pass up over suitable guide pulleys 22 and 23, rotatably supported in any well known manner on a shaft 24, which is supported in turn by the bracket extension 17. From the pulleys 22 and 23, the threads pass downwardly under suitable guide pulleys 25 and 26, which are also rotatably supported in any well known manner on a shaft 27, which is supported in any well known manner by an extension 28 on the bracket 2.

Leaving for the moment the elastic threads, there is provided on the supporting frame 1, a shaft 29, which is removably journaled in any well-known manner on the supporting frame 1 and has secured thereto in any well

known manner a reel 30, which is adapted to supply an elastic layer 31 of any suitable material, such as rubber, to the assembling and folding device. The shaft 29 is also provided with a brake-wheel 32, over which passes a brake-band 33, secured at one end in any well known manner to the frame 1, and at the other end to a lever 35, pivoted in any well known manner to the frame 1, and which has an adjustable weight 36 thereon, whereby the tension on the brake-band 33, and thus on the fabric layer 31, may be adjusted.

The elastic rubber layer 31 passes from the reel 30 under a feed roll 37, which is secured in any well known manner to a shaft 38 journaled in any well known manner on the frame 1. From the feed roll 37, the elastic layer passes up over a roll 39, which is secured on a shaft 40, which in turn is journaled in any well known manner on brackets 41 on the frame 1.

Removably secured on a shaft 42, which is removably journaled in a bracket 43 on the frame 1, there is provided a reel 44, which is adapted to supply another layer 45 of material to the assembling and folding mechanism. The shaft 42 also has a tension brake-wheel 90 secured thereto, over which is adapted to pass a suitable brake-strap 91, which is rigidly secured at one end, and has a plurality of weights 92 secured at the other end. By this means, the tension on the strip of material 45 may be regulated. This layer 45 passes up over a roller 46, which is rotatably supported on a shaft 47, which in turn is secured in any well known manner to the brackets 41. Connecting the brackets 41 and secured thereto in any well known manner, there is provided a cross bar 48, which rotatably supports in any well known manner, suitable guide pulleys 49 and 50, which are adapted to guide the flexible threads 12 and 13 which extend from the guide pulleys 25 and 26.

The supporting and feeding mechanism for the component parts of the composite fabric, which consists of the backing layer 8, the side elastic threads 12 and 13, the elastic filler layer 31 and the facing layer 45 have now been described. All of these component parts extend to and through a folder 51, which will now be described.

There is provided for the folder, a supporting bar 55, by means of which it may be removably secured to the cross bar 48. The folder proper consists of a base 56, the side edges 57 of which are gradually turned up and folded over from the rear toward the front until they form side flanges extending substantially parallel to the remainder of the base. For the greater part of their length from the rear toward the front, the side flanges 57 are provided with guards 58, which consist of the extreme edges of the metal bent over parallel to the flanges 57. The flanges 57 are connected at the extreme rear by means of a cover-plate 59 which is cut away from the flanges intermediate its ends, and extends forward of the folder to the extreme front, where it forms a passage 60 between itself and the base 56. The facing fabric layer 45 is adapted to pass through this passage 60 and be folded over with its edges on the top of the other layers of material 31 and 8, which pass respectively through passages 61 and 62, formed by a metal strip 63 bent back and folded on itself in parallel relation, and which is secured in any well known manner to the forward end of the folder 51.

The means for feeding the elastic threads 12 and 13 to their positions in the outer edges of the folds formed in the facing layer 45, consists of a pair of tubular guides 64 and 65, which are secured in any well known manner to the side edges of the cover-plate 59, and are diverged in such a manner as to deliver the threads within the folded edges of the layer 45 at the extreme outer portion of the folds. The composite fabric, assembled and folded, is delivered from the folder 51 to a suitable compressing device. This device consists preferably of a pair of rolls 66 and 67, which are adjustably secured in brackets 68 and 69, which are supported in any well known manner on the frame 1. The pressure with which the rolls contact is adjusted by means of suitable hand-wheel screws 70, which contact with the upper floating bearings 71 of the roll 66. The roll 67 is secured on a suitable shaft 72, which is driven by a gear 73, which meshes with a pinion 74 on a drive-shaft 75, which in turn is driven by means of a belt which is adapted to be shifted from a tight pulley 76 to a loose pulley 77. The drive-shaft 75 also has secured on its outer end a sprocket-wheel 78, which is adapted to drive through a suitable chain 79, a sprocket-wheel 80 on the shaft 38, which rotates the feed roller 37.

In the operation of the device, the facing strip 45 and the backing strip of fabric 8 are fed to the folder 51 and the rolls 66 and 67 under a slight tension, so that they are kept just taut. The elastic strings 12 and 13 and the elastic band, however, are fed under a higher tension, so that they are abnormally distorted or extenuated. In passing through the folder, the edges of the facing strip 45 are turned over so as to form folds, within the extreme outer portion of which the elastic threads 12 and 13 are fed. The elastic band 31 is also fed between the facing strip 45 and the backing strip 8. All of the component parts of the composite fabric have been previously coated with a suitable cement before being placed on the various reels on this machine, so that when they pass between the rolls 66 and 67 the

pressure exerted will intimately cement the various parts of the composite fabric together. As soon as the composite fabric leaves the rolls, the tension on the elastic threads 12 and 13 and the elastic band 31 being released, these members draw the composite fabric together, forming a multitude of infinite wrinkles or bends in the facing and backing strips intermediate their side edges, and a number of larger wrinkles or corrugations close to the side edges between the elastic band and the elastic threads. The tension on the various reels may be adjusted by means of varying the weights on the flexible brakes. The tension on the elastic strips 12 and 13 may be further varied relative to each other by means of the floating weighted pulleys 19 and 20.

Having thus described our invention, we claim as new and desire to secure by Letters Patent:—

1. In a device of the class described, the combination with a supporting frame, of a facing fabric reel rotatably supported on said frame, a slip-tension for said reel, a backing fabric reel rotatably supported on said frame, a slip-tension for said backing fabric reel, an elastic-band reel rotatably supported on said frame intermediate said first-mentioned reels, an adjustable slip-tension for said elastic-band reel, means for drawing the elastic band from said reel, means for driving said last-mentioned reel, a plurality of elastic-thread reels rotatably supported on said frame, guides for said elastic threads, floating weights supported by said elastic threads interposed between said guides, a mechanical device for inserting said elastic band between said backing fabric and said facing fabric, said mechanical device including means for folding the edges of said backing fabric, and also including means for inserting said elastic threads in said folded edges of said backing fabric, and a pressure device for compressing said fabrics to said elastic band and elastic threads.

2. In a device of the class described, the combination with a supporting frame, of a facing fabric reel rotatably supported on said frame, means for tensioning said reel, a backing fabric reel rotatably supported on the frame, means for tensioning said reel, an elastic band reel rotatably supported on said frame intermediate the first mentioned reels, means for tensioning said reel, means for drawing the elastic band from the said reel, a plurality of elastic thread reels rotatably supported on the frame, guides for the threads, tensioning devices for the threads, means for inserting the said band between the backing fabric and the facing fabric, said means comprising a plate having at each edge a folder for turning over the edges of the facing fabric, tubular guides through which the threads pass, said guides delivering adjacent to the turning-over means and a pressure device through which the completed article is passed.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

ERNEST STRAUSS.
WILLIAM B. ERSKINE.

Witnesses:
HORATIO WHITING,
PHILIP D. ROLLHAUS.